

Draft Findings of the Monterey County LCP Periodic Review

CHAPTER 3: Environmentally Sensitive Habitat Areas

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CHAPTER 3: Environmentally Sensitive Habitat Areas

A. Coastal Act Policy

One of the primary objectives of the California Coastal Act is to preserve, protect, and enhance environmentally sensitive habitat areas (ESHA). Section 30107.5 of the Coastal Act defines an “environmentally sensitive area” as:

Any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.

There are various important elements to the definition of ESHA. A geographic area can be designated ESHA either because of the presence of certain plant or animal species or because of the presence of a particular habitat. In order for an area to be designated ESHA, the species or habitat must be rare or especially valuable. Areas may be valuable because of their “special nature,” such as being an unusually pristine example of a habitat type, containing an unusual mix of species, supporting species at the edge of their range, or containing species with extreme variation. Sites may also be valuable because of their role in the ecosystem, such as providing essential habitat for rare, threatened or endangered species. For example, existing preserves and critical habitat for federally listed species typically meet the definition of ESHA. Sites that are contiguous to or provide direct connectivity between preserves or properties that meet ESHA criteria may contribute to the long-term viability of an area by providing buffers and/or corridors for species migration and movements. Finally, to qualify as ESHA an area must be easily disturbed or degraded by human activities.

The central provisions of the Coastal Act aimed at protecting ESHA is Sections 30240. Section 30240 prohibits any significant disruption of habitat values, and limits development within ESHA to uses that are dependent on the resources. It also requires that development adjacent to ESHA be sited and designed to prevent significant degradation, and be compatible with the continuance of the habitat.

In addition the following Coastal Act provisions also address ESHA and other resource protection:

- Section 30230 applies to marine habitats, and calls for the maintenance, enhancement and restoration (where feasible) of marine resources, with special emphasis on areas and species of special biological or economic significance. Pursuant to this section, all uses of the marine environment must sustain the biological productivity of coastal waters, and maintain healthy populations of all marine organisms.

- Section 30231 provides that the biological productivity of coastal waters, streams, wetlands, estuaries, and lakes must be maintained and, where feasible, restored. This is to be achieved by, among other means: minimizing adverse effects of wastewater discharges and entrainment; controlling runoff; preventing depletion of groundwater supplies and substantial interference with surface water flow; encouraging wastewater reclamation; maintaining natural buffer areas that protect riparian habitats; and minimizing alteration of natural streams.
- Section 30233 protects wetlands and other coastal waters by limiting their alteration for only certain uses; where there is no feasible less environmentally damaging alternative and where feasible mitigation measures have been provided.
- Section 30250a directs new residential, commercial, or industrial development to existing developed areas. Where developed areas cannot accommodate new development, is to be located in other areas where it will not have significant adverse effects, either individually or cumulatively, on coastal resources.

Recognizing that these policies have the potential to conflict with other goals of the Coastal Act, the following guidance is provided by other sections:

- The provision of maximum public access and recreation opportunities must be consistent with protecting natural resource areas from overuse and must take into account the fragility of natural resources (Sections 30210 and 30214).
- The diking, filling, or dredging of coastal waters is limited to specific purposes, and permitted only where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects (Section 30233).
- The alteration of rivers and streams are limited to necessary water supply, flood control, and habitat restoration projects, and must incorporate the best mitigation measures feasible. (Section 30236)
- Basic goals for the coastal zone include assuring balanced use and conservation of resources taking into account the social and economic needs of the people of the state (30001.5)
- Policy conflicts should be resolved in a manner which on balance is most protective of significant coastal resources (30007.5).
- Implementation is to guard against an unconstitutional taking of private property (30010).

In order to assure that the LCP is effectively implemented in conformance with these Coastal Act provisions, the LCP must include, and the County must implement, policies that provide for:

- Identifying and guiding specific delineation of environmentally sensitive habitat areas;

- Only allowing resource dependent uses (such as restoration) in these habitat areas;
- Determining impacts from developments on the habitats;
- Avoidance of adverse impacts on the habitats;
- Buffering of the habitats;
- Mitigation measures for direct and indirect impacts on the habitats;
- Permanent protection of the habitats; and
- Maintenance, management, monitoring, and restoration of the habitats.

These provisions apply to all environmentally sensitive habitat areas, and more detailed provisions apply to specific habitats, such as wetlands and streams. LCPs should also include policies and ordinances to protect other habitat resources that may be important but that do not necessarily constitute ESHA.

B. Monterey County Certified Local Coastal Program

1. Background

Monterey County is rich in sensitive habitat areas, which are described in general in each segment's land use plan. For example, the *North County Land Use Plan* identifies a variety of unique habitats that have been threatened to varying degrees by agricultural and residential uses. These include riparian corridors, sloughs, salt water and freshwater marshes, dunes, and maritime chaparral.

The *North County Land Uses Plan* calls out Slough habitats, such as Elkhorn Slough, for particular attention:

Perhaps most unique among all of these habitats are the sloughs, the estuarine waters resulting from the mixing of seawater with freshwater. They are also some of the most sensitive. The sloughs provide a sanctuary for harbor seals, sea otters, and a great variety of fish and birds. Factors with the potential to severely affect the stability and viability of the estuarine habitat are alterations in the drainage systems, sedimentation, and obstacles to water circulation (i.e., tidegates or undersized culverts). Oil spills are a particularly devastating possibility.

Similarly, the *Del Monte Forest Land Use Plan* contains the following overview description of sensitive habitat:

In the Del Monte Forest Area, examples of terrestrial, aquatic, and riparian habitats which have been determined to be entirely or in part environmentally sensitive include: the rare

Monterey cypress and endangered Gowen cypress forest communities, the endemic Monterey pine/Bishop pine association, remnants of the indigenous coastal sand dunes, riparian corridors, wetlands, and sites of rare and endangered plants and animals associated with these and other habitats...

The Del Monte Forest coast supports an abundance and diversity of marine life. The shoreline is characterized by high water quality, small protected beaches alternating with granite outcroppings, and an unusually wide variety of animal and plant life. Worthy of special attention in this marine community are the sea otter population and the many endemic species of algae.

The *Carmel Area Land Use Plan's* description of environmentally sensitive habitats includes discussions of riparian corridors, Monterey cypress forest, Gowen cypress woodland, significant stands of Monterey pine, coast redwood forest, north coastal prairie, and dwarf coastal chaparral. It observes that these environmentally sensitive habitats should be protected for a variety of reasons: their high scientific and educational values, their scenic values, their high wildlife values and/or their importance in watershed protection. The *Carmel Area LUP* calls out protection of the Carmel River riparian corridor as a particular concern.

Similar to Del Monte Forest, the Carmel area also supports a remarkable abundance and diversity of marine life:

Rocky intertidal areas, kelp beds, offshore rocks, bluffs, and cliffs are prominent plant and wildlife habitats along the Carmel coast. A number of species of pelagic birds, shorebirds, and marine animals, including the threatened sea otter, utilize and, to various degrees, depend upon these marine habitats ... The Carmel Bay and the marine waters surrounding Point Lobos Reserve are legally protected through their designation as Areas of Special Biological Significance and Ecological Reserves.

The *Carmel Area LUP* also lists some of the rare, endangered, and sensitive species known at the time of certification, including Hickman's onion, sandmat manzanita, Monterey ceanothus, Hutchinson's delphinium, California dichondra, Point Lobos eriogonum, Gardener's yampah, and Rhododendrons.

Finally, *Big Sur Coast Land Use Plan's* general summary description of ESHA acknowledges the significant value of habitats along this stretch of coast:

The Big Sur coast supports a wealth and diversity of environmentally sensitive habitats perhaps unsurpassed in California. Many of these, especially in the marine environment, are in an essentially undisturbed condition yet are endangered by changes in land use or offshore activities. Some sensitive habitats already enjoy protection under laws guiding local, state, and federal agencies. Some sensitive marine resources are protected by sections of the Fish and Game Code, the Federal Migratory Bird Act, the Marine Mammal Protection Act, and the Federal Endangered Species Act of 1973. Wildlife habitats are protected where

they occur in legally designated areas such as the California Sea Otter Refuge, and rare and endangered plants are singled out for preservation under State and Federal legislation. Many of Big Sur's terrestrial habitats, however, including sensitive plants, dunes, serpentine rock associations, riparian corridors, coastal prairies, and grasslands are without adequate protection.

2. Summary of Local Coastal Program Provisions

The County's four land use plans contain similar requirements to protect ESHA, including policies that prohibit non-resource dependent uses within ESHA and that require buffers and other protections from adjacent development. Each land use plan has a strong Key policy or guiding policy statement.

North County's Key Policy is:

2.3.1 The environmentally sensitive habitats of North County are unique, limited, and fragile resources of statewide significance, important to the enrichment of present and future generations of county residents and visitors; accordingly, they shall be protected, maintained, and, where possible, enhanced and restored.

Del Monte Forest's guiding ESHA statement is:

The environmentally sensitive habitat areas of the Del Monte Forest Area are unique, limited, and fragile resources, which are important to the enrichment of residents and visitors alike. Accordingly, they shall be protected, maintained, and, where possible, enhanced and restored in accordance with the policies of this LUP and the associated policies and maintenance standards of the OSAC Plan. All categories of land uses, both public and private, shall be subordinate to the protection of these areas.

Carmel Area's Key Policy states in part:

2.3.2 The environmentally sensitive habitats of the Carmel Coastal Segment are unique, limited and fragile resources of statewide significance, important to the enrichment of present and future generations of County residents and visitors; accordingly, they shall be protected, maintained and, where possible, enhanced and restored. All categories of land use, both public and private shall be subordinate to the protection of these critical areas (see Map B).

Only small-scale development necessary to support the resource-dependent uses may be located in sensitive habitat areas if they cannot feasibly be located elsewhere.

Finally, Big Sur's basic objective for protection of natural resources is:

2.2.1. The overall direction for the future of the Big Sur coast is based around the theme of preserving the outstanding natural environment. The County's objective is to develop and

effectively carry out a constantly improving system for managing man's use of the natural resources of the Big Sur coast for the long-term benefit of both visitors and residents.

The County's basic policy is to take a strong and active role in the stewardship and safeguarding of Big Sur's irreplaceable natural resources. Where there are conflicts, protection of these national resources is the primary objective with definite precedence over land use development.

In support of this objective, Big Sur's Key Policy for ESHA states:

3.3.1. All practical efforts shall be made to maintain, restore, and if possible, enhance Big Sur's environmentally sensitive habitats. The development of all categories of land use, both public and private, should be subordinate to the protection of these critical areas.

Each land use plan also includes more detailed ESHA protection policies specific to the area, with corresponding ordinances in each segment's implementation plan.¹ In particular, the LCP has a comprehensive set of ESHA policies covering all phases of ESHA evaluation, including ESHA identification, protection, mitigation, and restoration. Where relevant, these are discussed in more detail in the implementation analysis below.

C. Local Coastal Program Implementation Issues

1. Overview of Issues and Recommendations

As summarized above, Monterey County's coastal zone is rich in sensitive plant and animal habitats. The issue of their protection has arisen in many County permits approved since certification. The significance of ESHA issues in Monterey County was identified during LCP preparation and, as a result the LCP has a fairly comprehensive set of ESHA policies, covering all phases of ESHA evaluation, including identification, protection, mitigation, and restoration of sensitive habitats.

Nonetheless, review and analysis of local coastal permits through the post-certification monitoring process and this Periodic Review, in conjunction with evaluation of the certified LCP, reveals that some revisions to the generic ESHA policies, as well as specific ESHA policy refinements, are needed. The Periodic Review presents recommendations in thirty-one ESHA issue areas to ensure that the LCP and its implementation are consistent with the Coastal Act in light of changed circumstances, current knowledge both about resources and effective LCP implementation, and revised or updated Coastal Commission policy implementation and practices related to ESHA protection. Specific recommendations for all but four of these issue areas may be found in Appendix A, PART 1, pages 20-94.

¹ See Issue SH-1 ESHA Identification in Appendix A pp. 21-30 for citations to various ESHA definitions and provisions contained in the LCP.

As summarized in Section A above, the Coastal Act requires the protection of all identified ESHA, and only resource-dependent development is allowed in ESHA. This has not always been achieved through LCP implementation (for detailed examples see Issues SH-28 and SH-29). To assure that this is done, necessary revisions to various generic ESHA policies in the Monterey County LCP range from clarifying the basic definition of ESHA to more specific recommendations such as updating the methods for delineating wetlands and for identifying ESHA buffers. In general, some of the land use plan policies in certain segments lack all of the protective ESHA components found in other segment's policies, which has the potential to lead to, and in fact has resulted in, inconsistent application of ESHA protections across LCP segments. These differences in land use plan policies might be due to the fact that the land use plan segments were prepared at different times by different authors. For example, in terms of identifying ESHA, the LCP needs updated provisions both in terms of clear definitions and in terms of giving guidance for on-the-ground determinations in individual cases (**Issue SH-1: ESHA Identification**). The Commission's experience with coastal development permitting by the County has identified cases where ESHA has not been properly identified, such as the specific cases of maritime chaparral and Monterey Pine discussed in detail below. Since LCP certification, it has also become apparent that lists and maps of sensitive habitats may be misconstrued as identifying a complete and static universe of ESHA, which may result in existing ESHA's that were not previously listed or mapped being overlooked and not protected. This is not consistent with the Coastal Act. Therefore, based on a comparison of each land use plan segment's lists and definitions, detailed recommendations regarding the definition of ESHA are presented on pages 21-30 of Appendix A. to achieve coastal zone wide consistency and assure conformance with Coastal Act Section 30240 and 30107.5.

A similar problem was identified with respect to the Coastal Act requirements for development in and around ESHA. In order to insure adequate habitat protection, consistent application of the Coastal Act standard of allowing only resource-dependent uses in ESHA must be assured (**Issue SH-4: Resource-Dependent Uses in ESHA**). Again, numerous cases were identified in Periodic Review where non-resource dependent development may have been allowed in ESHA, due to lack of clarity in the land use plan policies. Recommendations to clarify language on this topic, especially for the Big Sur Coast and Carmel Area segments, are found on pages 32-34 of Appendix A. Similarly, since permit review revealed that the County relies heavily on the recommendations of the consultants who prepare biologic reports, it is important that these documents fully comport with LCP policies (**Issue SH-3: Biologic Reports**); oftentimes these reports do not strictly address requirements of the LCP that are intended to implement the Coastal Act requirements for ESHA protection. Recommendations on pages 31-32 of Appendix A are presented to ensure coastal zone wide consistency on this matter. Finally, the Periodic Review has documented numerous cases where new development potential was created through subdivisions in and around sensitive habitats (see Issues SH-28 and SH-29 for example). Thus, ESHA preservation by prohibiting the creation of new lots in ESHA is covered in recommendations on pages 34 –36 of Appendix A (see **Issue SH-5: Subdividing ESHA**).

There will be times when some ESHA is disturbed by either a resource-dependent use or a minimal non-resource use that must be allowed to prevent an unconstitutional taking of private property (**Issue SH-6: Mitigation for Habitat Loss**). Review of the LCP and County coastal development permitting has revealed that County mitigation policies that implemented in these cases need more specificity, particularly concerning appropriate mitigation ratios, as recommended on pages 36-37 of Appendix A. Much has been learned about the success or failure of mitigation efforts to protect different kinds of habitat. The lack of clear mitigation policies and practices that assure successful mitigation over the long-run may mean that the LCP is not implemented in full conformance with the Coastal Act. In addition to direct impacts to ESHA, indirect impacts to ESHA have resulted from the issuance of County coastal permits adjacent to ESHA. Initial issue scoping and coastal development permit analysis revealed a set of buffer and other adjacency mitigation policies that were inadequate for some segments (**Issues SH-11: Stream Buffers, SH-12: Wetland Setbacks, and SH-13: Other ESHA Setbacks**). Detailed recommendations for a consistent coastal zone wide approach to this topic are found on pages 54-66 of Appendix A.

In addition to generic ESHA policy recommendations, the Commission has identified through its analysis of LCP implementation certain activities that were not specifically addressed in the originally certified LCP that are now better understood with respect to their potential to cause ESHA impacts and, hence, where specific policies governing them are useful in protecting ESHA. Such activities have been identified in **Issue SH-10: Streambank Protection, Issue SH-14: Predator Management, Issue SH-16: Beach Grooming, Issue SH-18: Planting Invasives, Issue SH-19: Livestock Grazing, and Issue SH-21: Night Lighting**. Since the LCP to date has generally lacked policies for these activities, other than grazing, detailed recommendations to address them are found on pages 52-54, 66-67, 72 -82, and 84-86 of Appendix A. Finally, fifteen years of LCP implementation has continued to underscore that many agencies have an important role in protecting habitats (**Issue SH-15: Public Agency Coordination**). Thus, recommendations are presented for improving coordination among them on pages 67-72 of Appendix A, in order to assure maximum consistency with Coastal Act ESHA protection requirements.

The Periodic Review has also identified necessary recommendations for addressing Coastal Act requirements with respect to specific habitat types and areas. One basic protective measure often used by the Commission in certification of LCPs is to designate ESHA under an appropriate land use category that allows only resource-dependent uses. Issue identification discovered at least six areas where an updated, protective designation was needed to achieve consistency with the Coastal Act, based on clear changed circumstances since LCP certification (**Issue SH-22: Moro Cojo Slough Wetlands; Issue SH-23: Potrero Road Open Space; Issue SH-24: Odello-West; Issue SH-25: Sandholdt Road Area; Issue SH-26: Watertek Wastewater Plant; and Issue SH-27: Long Valley**). LCP land use and zoning designation recommendations and some associated policy updates for these areas are found on pages 86-94 of Appendix A. As discussed in SH-29, LCP designation changes are also warranted for areas of Monterey Pine ESHA in Del Monte Forest that were not identified at the time of LCP certification. Improved guidance is also needed for sand dune habitat (**Issue SH-31: Sand Dunes**).

Additionally, the LCP already contains specific policies for several categories of ESHA and even, in some cases, for individual species. Since LCP certification, the status of some species has changed (e.g., additional species have been listed as threatened or endangered) and more information has become available about the habitat requirements of some species. Based on such knowledge, recommendations are found on pages 30-31, 73-74 and 82-84 of Appendix A (for **Issues SH-2: Shoreline Resources, SH-17: Monarch Butterflies, and SH-20: Steelhead Streams**, respectively).

The protection of trees is covered by several County policies. Many County permits issued since certification involve some amount of tree cutting, tree preservation, and replacement tree planting. Review of this permit history has revealed the need to ensure updated and protective tree policies (**Issues SH-7: Non-natives as Habitat, SH-8: Timber Harvest, SH-9: Tree Removal**). Detailed recommendations to ensure tree protection (where warranted) are found on pages 37 –52 of Appendix A.

Although the County has yet to address western snowy plover protection in the permit process, some guidance regarding how to do so in a manner that is compatible with public access, to the extent possible, is necessary. This issue has been brought to the forefront of ESHA protection since certification of the LCP. Thus, it would be helpful for the LCP to be updated to contain some particular guidance for snowy plover protection. Indeed, building upon the recommendations noted above for better guidance in delineating habitats and preparing biologic reports, the County would benefit from having some form of guidance manual available that covers each sensitive species. As an illustration, the recommendations for plover that follow under Issue SH-30: Western Snowy Plover, are shown in one possible format that could be expanded to cover other habitats as well.

Finally, where a sensitive habitat is defined by the presence of a rare ecological community (as opposed to a single species of concern only), determining how it should be protected consistent with Coastal Act directives and Constitutional takings guarantees is a more complex task. Thus, three such communities present in Monterey County are discussed below in more detail. Central maritime chaparral (Issue SH-28) is present on many parcels in North Monterey County as well as on some parcels in other portions of the County's coastal zone. The development proposals in these areas have resulted in conflicts with the Coastal Act's ESHA protection requirements. Additionally, more information about the management requirements of this plant community is available now than when the LCP was written. Even when direct impacts to maritime chaparral are avoided, it is still being degraded by indirect impacts when new development occurs. The same holds true for native Monterey pine forest (Issue SH-29), which similarly is present on most parcels in the Del Monte Forest, as well as on some parcels in the Carmel Area. Finally, sand dunes occur on State beaches such as in Moss Landing, but are also present on 22 residential parcels and the adjacent golf course in Del Monte Forest and have been subject to development proposals, which has raised clear conflicts with Coastal Act ESHA policy objectives.

In sum, the Periodic Review has identified and analyzed thirty-one specific ESHA implementation issues. Based on this analysis, Appendix A and Section C.2 present recommendations necessary to assure that implementation of the Monterey County LCP is fully consistent with the ESHA

protection requirements of the Coastal Act and related policies, including Sections 30107.5, 30240, 30230, 30231, 30233, 30236, and 30250.

2. Issues Analyzed in Detail

In addition to the issues mentioned above that are covered in Appendix A, the following issues are discussed in more detail in this section: Issue SH-28 Protecting Central Maritime Chaparral and Issue SH-29 Protecting Monterey Pine Forest. An overview of each issue leads, followed by background information, applicable County LCP policies, a description of how the policies have been implemented, analysis, and, finally, corrective recommendations. There are then briefer discussions of Issue SH-30 Protection of Western Snowy Plover Habitat and Issue SH-31: Protection of Coastal Dunes.

a. Issue SH-28: Protecting Central Maritime Chaparral Habitat

(1) Overview

This subchapter addresses the following concern identified through issue scoping: **Ensure that central maritime chaparral is protected and allowed to thrive.**

Since certification of the LCP, newer information and better understanding of the importance of maritime chaparral habitat as environmentally sensitive habitat area has emerged. And, resource managers know more about the resource management measures needed to more effectively to protect and restore the habitat. Efforts have increased to protect this habitat through land acquisitions. However, the overall extent of the habitat has been impacted by incremental development of existing residential lots and of agricultural development. The LCP does not fully protect maritime chaparral as ESHA and permit review revealed that the County has continued to authorize new development in and adjacent to maritime chaparral, which continues to incrementally fragment and impact this ESHA. Therefore, the LCP has not been implemented in a manner consistent with Coastal Act objectives to avoid impacts to ESHA. The LCP needs to be revised and updated to strengthen protections for maritime chaparral and to promote protection and restoration of the overall maritime chaparral habitat ecosystem. Recommendations are made to better implement and revise some LCP policies, and also to develop provisions to guide maritime chaparral management.

Although the following analysis of this issue with respect to implementation of the LCP focuses on North Monterey County, the substance of the recommendations is applicable to other areas with native central maritime chaparral, including the Carmel and Big Sur Coast areas of Monterey County. The discussion of Issue LU-12: Carmel Area Uplands also includes analysis of maritime chaparral in that area and the discussion of Issue CH-9: Rural Fire Standards is also applicable to chaparral. This section also provides support for some of the recommendations mentioned in Section C.2 1 Issues Concerning Protecting ESHA in General above, such as the need for updated ESHA identification policies and procedures. Finally, this analysis also results in some additional general

ESHA recommendations for minimizing and mitigation of impacts from the development of existing legal residential lots within environmentally sensitive habitat areas.

(2) Resource Issue Background

Central maritime chaparral is a rare and significant environmentally sensitive plant community found on the slopes surrounding the Elkhorn Slough watershed and elsewhere in coastal Monterey County. This plant community is threatened by impacts of incremental development, fragmentation of the habitat system, impacts from fire suppression, and encroachment of invasive species. Impacts of incremental development, fragmentation of the habitat system, fire suppression, and encroachment of invasive species threaten this plant community. As the Commission has previously found in reviewing environmentally sensitive habitat area policies such as in the City of Malibu LCP, connectivity among habitats within an ecosystem and connectivity among ecosystems is very important for the preservation of species and ecosystem integrity. The Commission has noted that in a recent statewide report, the California Resources Agency² identified wildlife corridors and habitat connectivity as the top conservation priority. Central maritime chaparral is currently recognized by Monterey County and the Coastal Commission as an environmentally sensitive habitat area due to its limited distribution, ecosystem value as rare plant and animal habitat, and on-going reduction in geographic extent.

Central Coast Maritime Chaparral Habitat Characterization³

Central maritime chaparral is an uncommon vegetation type that has been identified as a rare plant community by the California Department of Fish and Game. This plant community is defined by plant species composition, proximity to the ocean and the maritime influences of fog and the marine layer, and is generally restricted to porous coastal marine sediments. At one time, central maritime chaparral covered extensive areas in north Monterey County. Map SH-28a depicts the approximate historic extent of central maritime chaparral.⁴ However, in the past forty years much of this habitat has been converted to agriculture and rural residential uses. Less than 1,700 acres remain (see Map SH-28a).⁵ This habitat loss and concomitant fragmentation leave the remaining patches susceptible to increased edge effects due to the invasion of non-native species.

² California Resources Agency. "Missing Linkages: Restoring Connectivity to the California Landscape," California Wilderness Coalition, Calif. Dept of Parks & Recreation, USGS, San Diego Zoo and The Nature Conservancy, 2001. Available at: <http://www.calwild.org/pubs/reports/linkages/index.htm>

³ This section is based on a literature review conducted by Tami Nakahara, as part of her forthcoming masters of science thesis for San Jose State University, *Management Strategies For Central Maritime Chaparral*. The literature that she used is cited in the following footnotes: 3, 5-8 and 10-24.

⁴ This map is adapted from GIS data layers created by Erik Van Dyke and Karen Holl, and described in a report prepared for the US Fish and Wildlife Service (dated April 26, 2003), titled *Mapping the Distribution of Maritime Chaparral Species in the Monterey Bay Area*. Van Dyke and Holl found that the current extent of *Arctostaphylos pajaroensis*, including occurrences located in successional woodland canopy, in fragmented areas, and in isolated remnants, corresponds somewhat conservatively with the extent of Arnold soils (Aromas red sands), often used as a proxy to represent the extent of maritime chaparral community and so can be used, as we have done, to represent the historic extent of North County maritime chaparral (personal communication, Eric Van Dyke, August 4, 2003).

⁵ Elkhorn Slough Foundation, press release, May 27, 2003.

The diversity of plant species in maritime chaparral is determined by various local factors such as climate, soils, elevation, slope, and fire frequency. Along the central coast of California, the maritime conditions reduce extreme fluctuations in the climate and may provide some relief from the summer drought. However, the major fog effect is most likely the widespread reduction of evaporative stress. In the northern part of the County, sandy soils are developed from the underlying Aromas red sands, which are well-drained and nutrient poor. The general topography of this area is characterized by rolling Prunedale hills. The northern and eastern slopes tend to be more heavily forested due to greater moisture levels, while the southern and western slopes are more often dominated by maritime chaparral. The ridgetops are covered with central maritime chaparral that extends down the southern slopes. The distribution of maritime chaparral in these locations is a result of thin soils, which creates a shallow root penetration zone and maritime influences. Maritime chaparral is also found in the vicinity of the Monterey Airport and Fort Ord, Toro Park, Jack's Peak, Larkin Valley, Gibson Canyon, and throughout the Del Monte Forest.

Central maritime chaparral type is frequently dominated by brittleleaf manzanita (*Arctostaphylos tomentosa*) plus one or more of four endemic manzanita taxa including: Pajaro manzanita (*Arctostaphylos pajaroensis*), Hooker's manzanita (*Arctostaphylos hookeri ssp. hookeri*), sandmat manzanita (*Arctostaphylos pumila*) and Monterey manzanita (*Arctostaphylos montereyensis*).⁶ At some locations, stand dominance is shared with chamise (*Adenostoma fasciculatum*). Other species that comprise this plant community include: black sage (*Salvia mellifera*), poison oak (*Toxicodendron diversilobum*), and coyote brush (*Baccharis pilularis*). A number of environmentally sensitive plant species are known to occur in maritime chaparral habitat in Monterey County as listed on the following Table SH-28a.

TABLE SH-28a. Sensitive Plant Species Associated With Maritime Chaparral In Monterey County

Scientific Name	Common Name	Rare/Threatened or Endangered Status ^a		
		Federal	State	CNPS
<i>Arctostaphylos cruzensis</i>	Arroyo de la Cruz Manzanita			CNPS 1B
<i>Arctostaphylos edmundsii</i>	Little Sur manzanita			CNPS 1B
<i>Arctostaphylos hookeri hearstiorum</i>	Hearst's manzanita			CNPS 1B
<i>Arctostaphylos hookeri hookeri</i>	Hooker's manzanita			CNPS 1B
<i>Arctostaphylos hooveri</i>	Hoover's manzanita			CNPS 4
<i>Arctostaphylos montereyensis</i>	Torro manzanita			CNPS 1B
<i>Arctostaphylos obispoensis</i>	Bishop's manzanita			CNPS 4
<i>Arctostaphylos pajaroensis</i>	Pajaro manzanita			CNPS 1B

⁶ Griffin, J. R., "Maritime chaparral and endemic shrubs of the Monterey Bay Region," *Madroño*, 1978, pp 65-112.

Scientific Name	Common Name	Rare/Threatened or Endangered Status ^a		
		Federal	State	CNPS
<i>Arctostaphylos pilosula</i>	Santa Margarita manzanita			CNPS 1B
<i>Arctostaphylos pumila</i>	Sandmat manzanita			CNPS 1B
<i>Aspidotis carlotta-halliae</i>	Carlotta Hall's lace fern			CNPS 4
<i>Calycadenia villosa</i>	Dwarf calycadenia			CNPS 1B
<i>Calyptridium parryi</i> var. <i>hesseae</i>	Santa Cruz Mountains pussypaws			CNPS 3
<i>Ceanothus cuneatus rigidus</i>	Monterey ceanothus			CNPS 4
<i>Chorizanthe douglasii</i>	Douglas' spineflower			CNPS 4
<i>Chorizanthe pungens pungens</i>	Monterey spineflower	Threatened		CNPS 1B
<i>Cordylanthus rigidus</i> ssp. <i>littoralis</i>	Seaside bird's beak		Endangered	CNPS 1B
<i>Cupressus abramsiana</i>	Santa Cruz cypress	Endangered	Endangered	CNPS 1B
<i>Eriastrum luteum</i>	Yellow-flowered eriastrum			CNPS 1B
<i>Eriastrum virgatum</i>	Virgate eriastrum			CNPS 4
<i>Ericameria fasciculata</i>	Eastwood's goldenbush			CNPS 1B
<i>Eriogonum butterworthianum</i>	Butterworth's buckwheat			CNPS 1B
<i>Galium hardhamiae</i>	Hardham's bedstraw			CNPS 1B
<i>Gilia tenuiflora</i> ssp. <i>arenaria</i>	Sand gilia	Endangered	Threatened	CNPS 1B
<i>Horkelia cuneata sericea</i>	Kellogg's horkelia			CNPS 1B
<i>Lomatium parvifolium</i>	Coastal biscuit root			CNPS 4
<i>Malacothamnus davidsonii</i>	Davidson's bush mallow			CNPS 1B
<i>Malacothamnus niveus</i>	San Luis Obispo County bush mallow			CNPS 1B
<i>Micropus amphibolus</i>	Mt. Diablo cottonweed			CNPS 3
<i>Mimulus rattanii decurtatus</i>	Santa Cruz County monkeyflower			CNPS 4
<i>Monardella undulata</i>	curly leaved mondardella			CNPS 4
<i>Piperia michaelii</i>	Michael's rein orchid			CNPS 4
<i>Piperia yadonii</i>	Yadon's rein orchid	Endangered		CNPS 1B

^a CNPS= California Native Plant Society; listing categories: CNPS 1B = "List 1B species: rare, threatened or endangered in California and elsewhere;" CNPS 3 = "Plants About Which We Need More Information - A Review List;" CNPS 4 = "List 4: Plants of Limited Distribution - A Watch List."

Animal species that are present in central maritime chaparral include: Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*) a state species of special concern, California deer mouse (*Peromyscus californicus*), brush rabbit (*Sylvilagus bachmani*), California quail (*Callipepla californica*), Heerman kangaroo rat (*Dipodomys heermanni*), California ground squirrel (*Spermophilus beecheyi*), California mule deer (*Odocoileus hemionus californicus*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), red-tailed hawk (*Buteo jamaicensis*), and northwestern fence lizard (*Sceloporus occidentalis occidentalis*). In most cases, animals living in maritime chaparral respond to the structure of the plant community and physical features of the environment, rather than certain plant species.⁷ Habitat preferences of animals depend on such factors as the age of the plant community, the amount of cover, proximity to openings in the vegetation, proximity to sources of water, ecotones, and physical features such as rocky slopes.

Insect species, such as beetles, ants, bumble bees, flies, moths, and butterflies are abundant in maritime chaparral and some species function as important pollinators for the flowering shrub species.⁸ Ground-inhabiting beetles include species from the Carabidae and Staphylinidae families, which prey on small arthropods and other organisms, and species from the Tenebrionidae family, which are mostly scavengers. Seed-gathering ants are an important part of the chaparral ant population. The flower-visiting insects consist of the bees, flies, moths, butterflies, and some beetles.

With respect to habitat identification, where there is dense shrub cover of appropriate species, especially manzanita species, the area in question is maritime chaparral. However, there may also be isolated patches of maritime chaparral habitat indicator species. The fragmented nature of these patches is likely due to past clearing activities and/or the encroachment of invasive species. If the area is cleared but the underlying soil has not been disturbed, chaparral will likely recolonize. As mentioned above, the soils, in combination with other factors such as fog, elevation, and slope, are critical variables in the establishment of this habitat. In cases where there are invasives, and they are removed, chaparral will also likely recolonize. However, if the underlying soil has been disturbed, then revegetation (i.e., planting) will be necessary to restore the chaparral. Even in areas that have been paved over, removal of the covering may result in natural chaparral regeneration if the seed bank is still present. These areas are also suitable for revegetation. Thus, the sum total of the area that was once the historic range of chaparral (i.e., based on the aforementioned soil, topographic, and climatic characteristics), even if not currently vegetated and while not necessarily environmentally sensitive habitat area may be considered degraded and potentially restorable maritime chaparral habitat.

Finally, Central maritime chaparral is a fire-adapted community. The role of periodic moderate fires is essential in maintaining the overall ecology of chaparral communities. The historic fire regime for

⁷ Quinn, Ronald D., *Habitat Preferences And Distribution Of Mammals In California Chaparral*, Berkeley, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, Research Paper PSW-202, 1990.

⁸ Force, Don C., *Ecology of Insects in California Chaparral*, Berkeley, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, Research Paper PSW-201, 1990.

California chaparral was approximately once every 10 to 50 years.⁹ Under natural conditions, chaparral does not become highly prone to fires for about 15 to 25 years or until some of the shorter-lived species die and increase the dead fuel load.¹⁰

Threats to Maritime Chaparral Resources

The greatest threat to central maritime chaparral is direct loss due to conversion to other land uses and the resultant fragmentation of the remaining habitat. Other threats are fire suppression, nonnative plant invasion, hybridization, and Sudden Oak Death Syndrome.

Residential and agricultural development has led to habitat loss and fragmentation over many years in North County, as review of time series aerial photographs demonstrates. In two study areas, maritime chaparral has disappeared at an annual rate of nearly 1% since 1931 (see Map SH-28b).¹¹ Most of this loss is due to succession in the absence of fire; i.e., oak woodlands and to some extent eucalyptus forest are invading and eliminating the maritime chaparral. One study area has also experienced significant losses due to clearing for agriculture and residential uses. There remain approximately 175 vacant parcels containing maritime chaparral in North County. In one study area out of 56 remaining vacant parcels, four are predominately maritime chaparral.

Homeowners can also affect the ecosystem by introducing invasive nonnative plants into the landscaping around their homes that escape into surrounding native habitats. The invasion of nonnative species may alter ecosystem functions such as nutrient cycles, hydrology, and wildfire frequency, and the natural community structure through direct competition for resources and space, the exclusion of some species through allelopathic affects, and the hybridization of rare, threatened, or endangered species.¹² Some examples of aggressive nonnative species invading central maritime chaparral include pampas grass (*Cortaderia jubata*), iceplant (*Carpobrotus edulis*), eucalyptus (*Eucalyptus globulus*), and nonnative grasses.¹³

⁹ Hanes, T. L., "California Chaparral," in Barbour, M.G. and J. Major, *Terrestrial Vegetation of California*. Sacramento, CA: California Native Plant Society, 1995 and Holland, V. L., and David J. Keil., *California Vegetation*. Dubuque, Iowa: Kendall/Hunt Publishing Company, 1995.

¹⁰ Radtke, Klaus W. H., *Living more safely in the chaparral-urban interface*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture. General Technical Report PSW-67, 1992 and Barbour, Michael, Bruce Pavlik, Frank Drysdale, and Susan Lindstrom. *California's Changing Landscapes: Diversity and Conservation of California Vegetation*. Sacramento, CA: California Native Plant Society, 1993.

¹¹ Personal communication, Eric Van Dyke, June 3, 2003. This information is from his forthcoming study which includes a comparison of maritime chaparral coverage based on aerial photography analysis over time (using 1931, 1980, and 2000 images) in two North County study areas: Long Valley and around Paradise Canyon Road.

¹² Radtke, Klaus W. H., *Living more safely in the chaparral-urban interface*, Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, General Technical Report PSW-67, 1992; Hobbs, Richard J., and Laura F. Huenneke, "Disturbance, diversity, and invasion: Implications for conservation," *Conservation Biology* 6, no. 3:324-337, 1992; Levin, Donald A., Javier Francisco-Ortega, and Robert K. Jansen. "Hybridization and the Extinction of Rare Plant Species." *Conservation Biology* 10, no. 1:10-16, 1996 and Bossard, Carla C., John M. Randall, and Marc C. Hoshovsky, eds. *Invasive Plants of California's Wildlands*. Berkeley, CA: University of California Press, 2000.

¹³ Mercurio, Ed. *Biological Survey Report for the Ron Whitehead Property*. Salinas, CA: Monterey County Planning Department. Biological Survey Report 26.07.074, 1998.

Fire suppression regimes also create a variety of management problems, such as infrequent intense fires. This is the result of the accumulation of large amounts of brush and debris, as the years pass. This material creates large fuel loads, which can result in fires that burn hotter and longer and consume everything.¹⁴ The intense heat can also sterilize the soil, removing nutrients and killing microorganisms that the native plants depend on.¹⁵ Smaller, more frequent fires, as in prescribed burns, are less destructive since they do not burn as hot as wildfire.

Another problem with fire suppression is community succession from central maritime chaparral to oak woodland. Fire is essential in maintaining the structure and composition of the central maritime chaparral community. Many chaparral plants, such as Pajaro manzanita and Hooker's manzanita, require periodic fires for the germination of their seeds, which are both obligate seeders.¹⁶ The older stands of mature chaparral generally have the lowest species diversity and are usually even-aged.¹⁷ Eventually, the shrubs die off under the shade of the closing tree canopy. This change in plant community not only results in the loss of rare maritime chaparral plant species, it also impacts the animal species that utilize this habitat by altering the availability of food, shelter, and breeding grounds. Populations of rare, chaparral-dependent animal species, such as the Monterey dusky-footed woodrat, may decline further with the loss of their habitat.

The loss of vegetation from fires can also create problems on steep slopes, by causing erosion and sedimentation. After fire has removed the vegetative cover on slopes, rains cause the barren soil to become supersaturated, resulting in overland runoff and landslides.¹⁸ The resulting erosion causes sedimentation into nearby creeks and rivers, which creates scouring of the banks, leading to more erosion, sedimentation, and flooding downstream.¹⁹ Waxes and resins released from decomposing litter and burned chaparral coat soil particles, causing them to become water resistant and increasing runoff.²⁰ The loss of topsoil results in the loss of nutrients contained in this layer. The loss of

¹⁴ Green, Lisa R. *Burning by prescription in chaparral*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture. General Technical Report PSW-51, 1981; Moore, Howard E. *Protecting residences from wildfires: A guide for homeowners, lawmakers, and planners*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture. General Technical Report PSW-50, 1981; California Department of Forestry. *Chaparral management program*. Sacramento, CA: The Resources Agency, 1981; Radtke, Klaus W. H., *Living more safely in the chaparral-urban interface*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, General Technical Report PSW-67, 1992; Barbour, Michael, Bruce Pavlik, Frank Drysdale, and Susan Lindstrom, *California's changing landscapes: Diversity and conservation of California vegetation*. Sacramento, CA: California Native Plant Society, 1993.

¹⁵ Bossard, Carla C., John M. Randall, and Marc C. Hoshovsky, eds., *Invasive Plants of California's Wildlands*, Berkeley, CA: University of California Press, 2000.

¹⁶ Matthews, Mary Ann., *An illustrated field key to the flowering plants of Monterey County and ferns, fern allies, and conifers*. Sacramento, CA: California Native Plant Society, 1997.

¹⁷ Radtke, Klaus W. H., *Living more safely in the chaparral-urban interface*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture. General Technical Report PSW-67, 1992.

¹⁸ Moore 1981; Radtke, Klaus W. H., *Living more safely in the chaparral-urban interface*. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, General Technical Report PSW-67, 1992; California Department of Forestry and Fire Protection, 2000.

¹⁹ Radtke, Klaus W. H., *Living more safely in the chaparral-urban interface*, Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture, General Technical Report PSW-67, 1992.

²⁰ Hanes, T. L., "California Chaparral," in Barbour, M.G. and J. Major, *Terrestrial Vegetation of California*. Sacramento, CA: California Native Plant Society, 1995; Holland, V. L., and David J. Keil, *California Vegetation*. Dubuque, Iowa: Kendall/Hunt

vegetative cover causes the loss of nutrient cycling from mature vegetation, increased loss of soil moisture, and soil temperatures to fluctuate over a greater range, affecting the germination and survival of plants and the animals that depend on them.²¹

In addition to fire suppression issues, it has recently been discovered that Sudden Oak Death (SOD) syndrome may be a threat to central maritime chaparral. SOD is caused by *Phytophthora ramorum*, a recently identified microbe related to brown algae but commonly referred to as a fungus.²² *P. ramorum* was first found to affect three species of native oaks in California: tanoak (*Lithocarpus densiflorus*), black oak (*Quercus kelloggii*), and coast live oak (*Quercus agrifolia*).²³ Coast live oaks are a component of central maritime chaparral communities and are also part of the transitional oak woodland communities that border central maritime chaparral. Manzanita County Park personnel in North Monterey County recently identified and removed an infected coast live oak within the park.²⁴ The huge dieback of oaks not only disrupts ecosystems, through the loss of habitat and food for wildlife, it also increases the amount of dead vegetation that may lead to destructive wildfires.²⁵

Overall, natural disturbance and human impacts are critical concepts in the management of central maritime chaparral. As discussed above, central maritime chaparral experiences many types of impacts, such as fire suppression, wild fires, prescribed burning, erosion, flooding, habitat fragmentation, invasions, hybridizations, and disease. However, it is critical that the type and frequency of disturbance that promotes the survival of this environmentally sensitive habitat community is maintained (if not naturally, then through human management). Thus, managing disturbances and impacts can pose problems for resource managers. The continued existence of a

Publishing Company, 1995; and Smith, Douglas, Bob Curry, Donald Kozlowski, Regina Williams, Fred Watson, Leslie Turrini-Smith, and Wendi Newman, *Watershed and riparian assessment report (WRAR): Bureau of land management former Fort Ord, Monterey County, California*,” Seaside, CA: The Watershed Institute, 2002, see also website address at <http://home.csUMB.edu/s/smithdouglas/world/wrar/wrapage.html>.

²¹ Hanes, T. L., “California Chaparral,” in Barbour, M.G. and J. Major, *Terrestrial Vegetation of California*. Sacramento, CA: California Native Plant Society, 1995 and Holland, V. L., and David J. Keil, *California Vegetation*. Dubuque, Iowa: Kendall/Hunt Publishing Company, 1995.

²² Frankel, Susan, *Symptoms of Phytophthora ramorum, a new pathogen causing sudden oak death*. Berkeley, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, 2001, see also website address at <http://www.cnr.berkeley.edu/comtf/pages/symptoms/introduction.html> and Garbelotto, et al., 2002 Kan-Rice, Pam, “Oak killer found in rhododendrons,” *California Agriculture* 55, no. 1:7-8, 2001, <http://danr.ucop.edu/calag/JF01/pdfs/resupd.pdf>.

²³ Zandonella, Catherine, “Press release: UC researchers announce results that could complicate measures to halt spread of sudden oak death,” Berkeley, CA: University of California Berkeley, Media Relations, 10 January, 2001, see also website address at http://www.berkeley.edu/news/media/releases/2001/01/10_oak.html; Kan-Rice, Pam, “Oak killer found in rhododendrons,” *California Agriculture* 55, no. 1:7-8, 2001, <http://danr.ucop.edu/calag/JF01/pdfs/resupd.pdf>; Garbelotto, Matteo, Pavel Svihra, and David M. Rizzo, “Sudden oak death syndrome fells 3 oak species,” *California Agriculture* 55, no. 1:9-19, 2001, <http://danr.ucop.edu/calag/JF01/pdfs/oakdeath.pdf>; Garbelotto, Matteo, David M. Rizzo, Jennifer M. Davidson, and Susan J. Frankel, *How to recognize symptoms of diseases caused by Phytophthora ramorum causal agent of sudden oak death*, 2002, <http://suddenoakdeath.org/>.

²⁴ Personal communication, Tami Nakahara, March 19, 2003, based on agency interview data with Richard Higgins, North Monterey County Parks manager, March 5, 2002 for her forthcoming Masters Thesis, *Management Strategies for Central Maritime Chaparral*.

²⁵ Zandonella, Catherine, “Press release: UC researchers announce results that could complicate measures to halt spread of sudden oak death,” Berkeley, CA: University of California Berkeley, Media Relations, 10 January, 2001, http://www.berkeley.edu/news/media/releases/2001/01/10_oak.html.

species or community often requires some type of disturbance, so disturbance regimes need to be incorporated into management plans.²⁶

Responses to to Protect Maritime Chaparral Resources

To date, efforts to protect Central maritime chaparral include conservation, acquisitions, and management.

The Natural Resource Conservation Service works with farmland owners in North Monterey County on a volunteer basis to prevent erosion and otherwise conserve their land (see Issue WQ-8 in Chapter 4). If the land includes maritime chaparral, then the Service recommends avoiding sensitive species; preventing erosion by keeping livestock from degrading habitat; and discouraging farming on slopes exceeding 15%.²⁷ If chaparral is disturbed, the Service recommends the following mitigation: one-to-one ratio for replacement of native plant species that are removed; control invasive exotic plant species where possible if the landowner agrees; and control excessive erosion by vegetative methods or structural practices as needed.

Recently, the Elkhorn Slough Foundation adopted the *Elkhorn Slough Conservation Plan*, which was approved by the Coastal Commission.²⁸ This was followed by *Elkhorn Slough at the Crossroads: Natural Resources and Conservation Strategies for the Elkhorn Slough Watershed*.²⁹ A major thrust of these plans is to acquire (in fee title or through easements) and protect large connected blocks of maritime chaparral and associated oak woodlands. Included in the Strategies is a map illustrating upland ridges of potential unfragmented chaparral. Some of the parcels the Foundation subsequently purchased contain central maritime chaparral, including 68 acres on the Hamby Ranch, acquired in 2003. The Foundation estimates that it now owns over one-fourth of the remaining chaparral habitat in North County.

The U.S. Bureau of Land Management manages Fort Ord, which has large expanses of maritime chaparral. They have a management plan that calls for prescribed burning on a rotational basis every 12 to 15 years.³⁰ Reviews of the success of their efforts and others are leading to increased scientific understanding of the plant community and the measures needed to ensure its survival.

²⁶ Hobbs, Richard J., and Laura F. Huenneke, "Disturbance, Diversity, and Invasion: Implications for conservation," *Conservation Biology* 6, no. 3:324-337, 1992.

²⁷ Personal communication, Tami Nakahara, March 19, 2003, based on agency interview data for her forthcoming Masters Thesis, *Management Strategies for Central Maritime Chaparral*.

²⁸ Scharffenberger, Tom, *Elkhorn Slough Conservation Plan*, July 1999 prepared for Elkhorn Slough Foundation.

²⁹ Elkhorn Slough Foundation *Elkhorn Slough at the Crossroads: Natural Resources and Conservation Strategies for the Elkhorn Slough Watershed*, March 2002.

³⁰ U.S. Army Corps of Engineers (USACE), Sacramento District, "Draft final interim action ordnance and explosives remedial investigation/feasibility study for ranges 43-48, range 30A, site OE-16 former Fort Ord," California. January 18, 2002, Sacramento, CA: Harding ESE, Inc. <http://www.fortordcleanup.com/docreview.asp>.

(3) Local Coastal Program Provisions

Land Use Designations Over Chaparral

Most maritime chaparral areas in North Monterey County are designated for low density or rural density residential land uses. For the Long Valley area, though, there is a Special Treatment overlay where maritime chaparral is to be protected to the maximum extent feasible (*North County LUP* policy 4.3.6.D.7; see Issue SH-27). A significant stand of chaparral in Manzanita Park is designated Outdoor Recreation, where moderate intensity recreational use is allowed that is compatible with the natural resources of the site (*North County LUP* policy 4.3.1.C).

Specific Chaparral Provisions

County Code Section 20.144.020.FFF contains the following definition:

Maritime Chaparral is a unique type of chaparral found close to the coast within the summer fog climate and characterized by a high proportion of localized endemic plant species.

North County LUP Policy 2.3.2.A.2 provides:

Maritime chaparral is an uncommon, highly localized and variable plant community that has been reduced in North County by residential and agricultural development. Further conversion of maritime chaparral habitat to agricultural uses is highly discouraged. Where new residential development is proposed in chaparral areas, it shall be sited and designed to protect the maximum amount of maritime chaparral. All chaparral on land exceeding 25 percent slope should be left undisturbed to prevent potential erosion impacts as well as to protect the habitat itself.

County Code Section 20.144.040.C.1 implements this policy by requiring that maritime chaparral habitat not be converted to agricultural use. Where feasible, large and contiguous areas and corridors are to be placed in conservation easement and where development is proposed on parcels containing chaparral habitat, conservation easements are required over the portions of the parcel over 25% in slope and containing chaparral habitat.

Applicable General ESHA Provisions

North County LUP Section 2.3 lists maritime chaparral as an environmentally sensitive habitat area. Under policy 2.3.2.1 only resource-dependent uses are allowed in listed environmentally sensitive habitat areas and only if they will not cause significant habitat disruption. However, this policy does not list maritime chaparral as one of these specific environmentally sensitive habitat areas, but does include sites of known rare and endangered plant species.³¹

³¹ Although this analysis focuses on North County, central maritime chaparral is present in the other three segments. *Del Monte Forest Land Use Plan* Appendix A list of Environmentally Sensitive Habitats does not specifically identify the plant community as sensitive, but does identify two components of the community as sensitive: Eastwood's goldenbush and significant occurrences only of Sandmat manzanita. The Carmel Land Use Plan identifies the community as Chamise-Monterey Manzanita dwarf coastal chaparral and designates sensitive and as well identifies individual community species such as Sandmat Manzanita as sensitive.

Other general environmentally sensitive habitat area policies and corresponding *County Code* provisions do not have this limitation and, thus, would apply to maritime chaparral. Field surveys by qualified individuals are required to determine precise habitat locations and to propose mitigation measures to protect any environmentally sensitive habitat area. *County Code* Sections 20.144.040.B.2 and 3 provide that developments, including subdivisions, on parcels containing or within 100 feet of environmentally sensitive habitat areas are only to be approved where they will not adversely impact the habitat's long-term maintenance. Projects must be modified to avoid or minimize impacts and incorporate mitigation measures. Subdivisions which are completely within an environmentally sensitive habitat area are prohibited under *County Code* Section 20.144.040.B.4. Subdivisions of parcels containing environmentally sensitive habitat area are required to implement measures such as clustering, setbacks and restrictions on maximum building envelopes under *County Code* Section 20.144.040.B.5. *North County LUP* policy 2.3.3.A.1 requires public access be directed to less sensitive areas and designed and managed to protect the resources. *North County LUP* policy 2.3.3.A.3 requires domestic livestock be managed and controlled in areas where they would degrade or destroy environmentally sensitive habitat areas. Removal of vegetation and land disturbance through grading, excavation, paving and fill is limited. Landscape plans are required to use native, non-invasive species and minimize the loss of indigenous vegetation. LCP policies and standards require measures to ensure that adjacent development be compatible with the long-term maintenance of the resource. Maritime chaparral is required to be protected in certain specific areas, including Manzanita Park and Long Valley Watershed. (*North County LUP* policies 4.3.6.C.6 and 4.3.6.C.7).

The LCP also contains recommended actions for the County to work with a variety of other agencies on programs to protect environmentally sensitive habitat areas. These programs include initiation of a natural resource and water basin management plan, reserve areas, effective conservation easements, effective enforcement programs, acquisition of land, restoration programs, invasive plant controls and public education.³² Additionally, *North County Land Use Plan* policy 2.3.3.A.5 states that a fuel reduction program is to be developed to reduce the potential risk of wildfires, to maintain the vigor of plant communities, and to maintain the diversity and value of habitat areas and requires that controlled burning should be strictly limited and managed in maritime chaparral areas.

(4) Local Coastal Program Implementation

Approximately 135 coastal permits for new development in maritime chaparral areas were approved by Monterey County.³³ Approximately 130 additional coastal permits for new development were approved in areas that historically were maritime chaparral. The following were reviewed: permits

Big Sur Coast Land Use Plan does not specifically identify maritime chaparral as sensitive. See Issue SH-1: ESHA Identification on pages 21- 31 of Appendix A for further elaboration.

³² *North County LUP* policies 2.3.4.1; 2.3.4.3; 2.3.4.4; .2.3.4.5; 2.3.4.6.

³³ This figure was derived using a Geographic Information System (GIS), by overlaying County coastal permits and chaparral distribution information on an assessors parcel basemap. The chaparral distribution mapping was obtained from Erik Van Dyke and the Elkhorn Slough Foundation, and represents the current extent of maritime chaparral in the North County Planning Area. It is possible that additional permits, for parcels that do not currently contain maritime chaparral, were approved on former chaparral lands; thus this number may be conservative.

for subdivisions, a random sample of seven permits for homes, eight permits within the change analysis study area, and nine easements.

Subdivision Permit Review

The County approved at least six subdivisions of land covered with maritime chaparral. In three cases, modifications were made to the original proposals to eliminate building envelopes in maritime chaparral, at least in part in response to Coastal Commission staff comments to the County.³⁴ However, five of the six permits involve lots going up hillsides that at least historically were covered with chaparral. One subdivision approval appears to result in fragmentation of the habitat and in some chaparral plant species potentially being removed.³⁵ In another subdivision approval the building sites were moved out of maritime chaparral and the entire habitat was to be placed all in scenic easement. However, the final building envelopes are interspersed among the disjunct easements, not all identified chaparral is shown in the final easement boundary, and there are no setbacks from the habitat to the building envelopes.³⁶

Residential Permit Review

Seven coastal permits for development on parcels containing maritime chaparral were reviewed. In five of the seven cases, findings stated that the new development was sited to avoid the chaparral. In one case the development was described as about 100 feet away, in another two it appeared to be more than 100 feet away, and in two cases the setback, if any, was unclear. In four of the five cases, a scenic easement was required over some undeveloped portions of the property, but in three out these four, it did not appear that all of the maritime chaparral was placed under easement. Some degree of landscaping was required in all five cases, but limiting the plants to natives compatible with chaparral was not explicitly required in three of these. Biological reports were prepared for at least four of these cases.

Two homes were permitted within chaparral and although not excessively large, there was no explicit finding of minimizing footprint. Landscaping with natives was required. A scenic easement over the remaining chaparral was required in one of these cases. In the other case, the chaparral had been cleared before the application was made. Nevertheless, the County approved it by finding the house siting in the cleared area (over 25% slope) preferable to an alternative siting that would entail oak tree removal. Since the cleared area had manzanita that was already resprouting, the permit was conditioned to replant the manzanita.

Case Study Using Aerial Photography

Research is underway to quantify change in maritime chaparral coverage over time. The above-mentioned aerial photography analysis showed that 8 of the 19 instances of patches of chaparral cleared in the Lakeview study area since 1980 were matched to coastal permits issued by Monterey County (see Map SH-28b). In each of these eight cases the cleared area was for a house site and

³⁴ County coastal permits PC996036 (#A-3-MCO-02-07), MS87012 (3-MCO-99-158), and PLN980152 (3-MCO-00-069).

³⁵ County coastal permits PC996036 (appealed to the Coastal Commission as #A-3-MCO-02-077).

³⁶ County coastal permit PLN980152 (#3-MCO-00-069).

grounds. Within the Lakeview study area, only two cleared areas appear to be for agricultural purposes.³⁷

Easements

Research is underway to determine the success of placing easements over maritime chaparral by reviewing thirteen easements on ten parcels, were reviewed in the field, including nine easements in the coastal zone that were required as conditions of coastal permits. Preliminary results indicate that there is disturbance present in the some of the easement areas.³⁸ Disturbance includes trails and other cleared areas and resultant spreading of pampas grass and other invasives. In one case, cleared non-natives were dumped in the chaparral easement area. The research was hampered by lack of a baseline description of the easement's condition at the time it was granted, lack of clarity about what the easement was supposed to cover and its purposes, and difficulty in field identification of the easement. These observations correlate with those found in another thesis on protective easements in North Monterey County.³⁹ (See Chapter 10 Implementation and Administration of this report.)

(5) Analysis of Coastal Act Conformance

The Coastal Act requires the protection of environmentally sensitive habitat areas against any significant disruption of habitat values. No development may be permitted within ESHA, except for uses that are dependent on the resource. Section 30240 of the Coastal Act further requires that development adjacent to ESHA is sited and designed to prevent impacts that would significantly degrade ESHA and to be compatible with the continuance of the habitat areas. Section 30240 of the Coastal Act also requires that development adjacent to parks and recreation areas must be sited and designed to prevent impacts. Continued loss of central maritime chaparral since LCP certification runs counter to the Coastal Act objective of protecting environmentally sensitive habitat areas. Some of this loss may be attributable to natural cause. However, County coastal permit approvals have authorized much of this habitat loss. The County's LCP implementation experience raises specific concerns about allowing development, including new subdivisions in central maritime chaparral habitat, and about long-term habitat protection measures. In part the LCP is not being implemented in full conformance with Coastal Act policies and in part the LCP needs to be updated to reflect stronger protections for this environmentally sensitive habitat area.

Issuance of Permits for Development In Maritime Chaparral

The County has approved non-resource-dependent development in central maritime chaparral habitat. The approved permits followed land use plan designations and densities and applied specific chaparral protective policies, but not the main policy concerning allowed uses in ESHA. Maritime chaparral is defined as ESHA in the LCP. However, *North County LUP* policy 2.3.2.1, which limits development in ESHA to non-resource dependent uses, does not explicitly apply to

³⁷ Photography was not yet available to determine if any of the clearing occurred post-LCP certification and did not receive permits.

³⁸ Personal communication, Tami Nakahara, based on data collected for her forthcoming Masters Thesis, *Management Strategies for Central Maritime Chaparral*.

³⁹ Nunes, Lisa, *Evaluation of Land Conservation Measures for North Monterey County*, Master's Thesis Presented to San Jose State University, May 2002.

maritime chaparral. As written, it applies to sites of know rare and endangered plant species. As indicated above, most species in maritime chaparral are not officially classified as rare or endangered. Thus, adverse impacts to maritime chaparral ESHA could result if *North County LUP* policy 2.3.3.A.2 is read as the controlling applicable policy. When this policy is read in isolation (“protect the maximum amount”), it appears to condone some maritime chaparral clearing. The basis for such a policy is understandable given that it was written twenty years ago when less was known about this plant community, that building in chaparral had been occurring for years, and that there were many vacant parcels within chaparral. However, given the LCP’s own recognition of maritime chaparral as environmentally sensitive habitat area and given new knowledge of the needs of the ecosystem as a whole, the LCP needs to be updated to improve protections for this environmentally sensitive habitat area. This concern is further addressed under Issue SH-1: ESHA Identification which includes recommendations for updating and standardizing ESHA definitions and maps to remove any ambiguity as to whether maritime chaparral (along with other sensitive habitats not specifically mentioned in the current definitions) is ESHA.

To the extent that the County’s approvals allowed for some minimal development of existing legal lots, the Coastal Act provisions to prevent unconstitutional takings would be partially satisfied and would overrides the prohibition of non-resource dependent development in ESHA, although all other ESHA prescriptions would continue to apply (e.g. minimizing footprint, mitigating impacts, etc.) If some maritime chaparral clearing is found acceptable (to prevent a takings or to allow a resource-dependent use), then minimizing and mitigating the impacts should be required. The LCP already has a general provision (*County Code* Section 20.02.060.B.d) along these lines that allows for non-resource dependent use to occur in environmentally sensitive habitat areas, but incremental impacts of permits authorized illustrate the need to strengthen the LCP policies. This is reinforced by three observations.

First, permit review revealed a lack of explicit findings concerning how each standard of the LCP was being followed, and a consequent lack of sufficient mitigation through permit conditions. For example, County permits did not always precisely define the habitat or its location (see Issue SH-1), did not always require comprehensive landscape plans that specified compatible native planting, did not always specify setbacks from identified habitat, and did not always require easements over all of the (remaining) maritime chaparral. Based on what is known about the habitat threats, the permits reviewed do not always do an adequate job of ensuring the long-term integrity of the maritime chaparral community. This can be attributed in part to County reliance on consultant reports, without providing the consultants with the necessary guidance (see Issues SH-1 and SH-3). Consultant reports typically emphasize special status species identification on a site and then make judgments as to how to protect the identified plants or mitigate the impacts on the site, rather than assessing the totality of environmentally sensitive habitat plant communities (like maritime chaparral) as an ecosystem.

Second, even explicitly following all requirements on an individual parcel basis will not result in adequate protection of the overall habitat values. For example, since each parcel will have its own driveway and clearing, approved in isolation from adjacent parcels, overall habitat disturbance in the

vicinity of the project under review will not be minimized and large tracts of habitat will not remain undisturbed. This type of parcel by parcel fragmentation, absent more comprehensive ESHA evaluation of planning, will complicate efforts to address the fire issue, which as noted above, is an important part of effective management of maritime chaparral. Recommendation SH-28.5 suggests development of a comprehensive plan to protect, restore and manage the maritime chaparral habitat to counter fragmentation of habitat through incremental developments.

Third, the County has not required adequate compensatory mitigation for actual habitat loss. As noted in Issue SH-6: Mitigation for Habitat Loss, the County does not currently have an off-site mitigation program to address unavoidable habitat loss on single-family lots. This concern is addressed in Issue SH-6 recommendations for a minimum three-to-one replacement of disturbed environmentally sensitive habitat area acreage due to permitted development (see pages 36 –38 of Appendix A) and in Recommendation SH-28.4.

Implementation of Permits for Subdivision

As noted, the County has also approved subdivision of maritime chaparral lands that will not fully protect the habitat against significant disruption as required by the Coastal Act. The approach taken has been to delineate building envelopes outside of existing maritime chaparral. Whether this has resulted in any direct loss of chaparral plants is unknown, but one subdivision includes three building pad clearings in areas that were maritime chaparral in 1980. What can be predicted is that the fragmentation of the habitat into single-family lots is disruptive directly and indirectly (e.g., loss of ability of the habitat to regenerate and expand, complication in future management, introduction of human and pet activity, spread of invasives). Under County Code Section 20.144.040.B.5, which does not allow subdivision that results in adverse impacts to the habitat's long-term maintenance, the County could prevent this fragmentation. However, this provision relies on the biological survey to make such a determination. Also, other LCP provisions are less strict, such as the aforementioned North County LUP policy 2.3.2.1 and corresponding County Code Section 20.144.040.C.1.b. Ironically, the provision governing subdivision adjacent to habitats appears more protective than the policy governing subdivision within habitat. (See Issue SH-5) In sum, the combination of the varying provisions that can be applied to subdividing maritime chaparral and the discretion built into them does not ensure that there will be no significant habitat disruption.

The County has generally applied the LCP policies in its actions and both the County and the Commission have authorized such subdivisions. However, since certification more scientific information on the importance and value of the maritime chaparral environmentally sensitive habitat area and the effect of direct and indirect impacts on the habitat is known. As a result, past LCP interpretations and applications are no longer sufficient to achieve objectives of the Coastal Act environmentally sensitive habitat area protection policies.

Fragmentation of maritime chaparral lands through subdivision should not occur, at least in the interim, until a comprehensive plan for preserving the habitat is prepared and implemented, as outlined in Recommendation SH-28.3. It should be noted that this plan also would complement necessary efforts to protect the groundwater from depletion. (See Issue LU-8: North County Water

Supply and Agricultural Use) and the ground and surface waters from non-point source pollution (see Issue WQ-8: North County Water Quality and Watershed Restoration.)

Implementation of Long-Term Maritime Chaparral Protection Measures

Long-term protection of maritime chaparral needs to involve setting aside the habitat from development and managing it in a way that invasive plant establishment and other disruptions do not occur (see Recommendations SH-28.7, SH-28.10, and SH-28.11). The County's effort of placing maritime chaparral in easement is a start, but needs to be done in a manner that covers all of the environmentally sensitive habitat areas, adequate buffers, connecting corridors, and future management. Just placing a property under easement does not ensure the long-term health of the protected area. As preliminary data shows, direct and indirect (e.g., invasive plants) disturbance still occurs in the easement areas. Thus, while some perpetual requirements can be placed on landowners to manage the easement area, some independent party involvement is needed for more reliable, effective, and scientific stewardship (see Recommendation SH-28.8). Although the County is currently the recipient of the easements, it has no such oversight program, and likely does not have the resources to establish one.

Finally, focus on just the current extent of maritime chaparral may not be sufficient to ensure the long-term survival of the habitat given the loss and fragmentation that has already occurred. A comparison of the current extent of chaparral coverage with the historic range reveals multiple areas of loss and only fragmented remains. As noted, these areas could regenerate on their own or, if not, could be restored with human intervention. Where parcels are identified as having some habitat and development is allowed, biologic reports and resultant permit conditions sometimes address restoration on the remainder of the parcel. Where parcels are currently devoid of all vegetation, this is unlikely to occur but such a site may be restorable. Biological survey requirements emphasize identification of the plants found on the site (*County Code* Section 20.144.040.A.4) and generally do not identify potential for restoration, even though LCP provisions identify the need for long-term habitat survival. If the potential for any type of regeneration or restoration on an individual site is not described in the biologic report, development and implementation of an overall environmentally sensitive habitat area management plan for the maritime chaparral habitat as a whole system will be more difficult.

The *North County Land Use Plan* contains an admirable set of recommended actions in Section 2.3.4 for comprehensive natural resource planning, obtaining easements, pursuing acquisitions, restoring habitat, controlling invasives, promoting public education, and intergovernmental coordination. But, by and large, no County-sponsored initiatives have occurred to carry these out with regard to maritime chaparral. These all remain valid and await implementation. However, there is one recommendation, regarding fuel reduction (North County Land Use Plan policy 2.3.3.A.5), which runs counter to what is now known about long-term chaparral maintenance, should be updated as suggested in Recommendation SH-28.6.

Conclusion

The County LCP regulatory measures are not as explicit, directive, and detailed as needed, and implementation has not resulted in full conformance to Coastal Act policies to protect maritime chaparral environmentally sensitive habitat area. Furthermore, as this analysis indicates, proactive management of the maritime chaparral ecosystem including such measures as controlling invasive species and undertaking prescribed burns, is necessary for the long-term health of the environmentally sensitive habitat area. While some recent efforts are beginning in this regard, there has yet to be a level of resource management established to ensure the long-term health of the maritime chaparral community.

The Periodic Review suggests a multi-pronged approach to addressing maritime chaparral habitat protection. Regulatory provisions should be updated and revised to ensure full identification of maritime chaparral as environmentally sensitive habitat areas pursuant to Recommendations SH-28.1, SH-28.2 and S-28.3 and Recommendations for Issue SH-27 Long Valley. Better guidance for consultants, planners, and decision-makers needs to be developed pursuant to Recommendation SH-28.4 (A). Table SH-28b provides an example of the format that a guidance document for central maritime chaparral could take and its contents. Such guidance can be developed and provided, perhaps in loose-leaf form, for each environmentally sensitive habitat area. Guidance needs to account for the historic and current extent of habitat and the needs of the habitat as a whole in directing protection and restoration of the habitat. The County also needs to ensure that such provisions will be fully implemented over time. Better permit conditions and related easement provisions are necessary prerequisites. Also, it appears necessary for some entity, probably other than the County, to accept such easements and monitor and manage them over time (see Recommendation SH-28.8). Such an effort should be complemented by continued efforts to acquire additional maritime chaparral lands or easements over them (See Recommendation SH-28.7).

For the long term, the sum total of these measures would best be guided by an overall plan for preserving and enhancing the dwindling maritime chaparral habitat, as the LCP advocates. This would allow for decisions about what areas that need protection, for example, to be made on a collaborative, comprehensive basis, rather than on a case-by-case, site-specific, non-collaborative basis. It would provide the context for preparing biologic reports and resultant recommendations for individual parcels that is currently lacking and, hence would absolve each individual consultant report from having to do so. The aforementioned Elkhorn Slough Foundation publications are a good start in this direction. Continued, on-going, collaborative research into how to best protect and manage central maritime chaparral would complement such efforts (see Recommendation SH-28.9).

Table SH-28b Example of Potential Guidance Document Format and Information to be Included when Identifying and Describing Central Maritime Chaparral ESHA.

<p>Name of ESHA: <i>Central maritime chaparral</i></p>
<p>Basis for ESHA Determination: <i>Central maritime chaparral is listed as a rare plant community by the California Department of Fish and Game Natural Diversity Data Base. Some rare species known to occur in maritime chaparral: Eastwood's golden fleece (Ericameria fasciculata) ranked by the California Native Plant Society (CNPS) as extremely rare; Monterey ceanothus (Ceanothus cuneatus ssp. rigidus) on the CNPS watch list for plants of limited distribution; Pajaro manzanita (Arctostaphylos pajaroensis) and Hooker's manzanita (Arctostaphylos hookeri ssp. hookeri) both ranked by the California Native Plant Society (CNPS) as very rare; Yadon's piperia (Piperia yadonii) listed as federally endangered.</i></p>
<p>Background Information: <i>Maritime chaparral is a variable sclerophyll scrub of moderate to high cover (50-100%) dominated by forms of Arctostaphylos tomentosa plus one or more other narrowly distributed manzanita. Periodic fires appear necessary for reproduction.</i></p>
<p>Locations: <i>Uplands around Elkhorn Slough; Fort Ord; uplands above Carmel Highlands and Otter Cove; maritime chaparral is located in shallow, well-drained, sandy soils within the cool summer fog zone</i></p>
<p>Habitat Delineation: <i>Characteristic plants of the central maritime chaparral community in the Prunedale hills include: Pajaro manzanita (Arctostaphylos pajaroensis), Hooker's manzanita (Arctostaphylos hookeri ssp. hookeri), brittleleaf manzanita (Arctostaphylos tomentosa v. crustacea), chamise (Adenostoma fasciculatum), black sage (Salvia mellifera), poison oak (Toxicodendron diversilobum), and coyote brush (Baccharis pilularis). Habitat identification should be based on current and past characteristic vegetation cover (through use of historic aerial photography), soils, climate (fog zone), and characteristic animals in context of surrounding area. A location may be degraded or restorable habitat even if there is a lack of current characteristic vegetation.</i></p>
<p>Resource-Dependent Uses Allowed In This ESHA: <i>Scientific study; Habitat enhancement measures; Limited public access (see Issue PA-2: Public Access in ESHA)</i></p>
<p>Mitigation Measures for Activities Allowed In This ESHA: <i>Prevent spread of invasive plants by such means as removing plants with seeds from dispersal routes such as trails, roads, and waterways; closing unnecessary roads and trails; minimizing soil disturbance and replanting native vegetation quickly in disturbed areas; limiting the use of construction materials that may contain weed seeds or propagules such as gravel, mulch, and straw; washing vehicles and equipment that may be contaminated with weed seeds and other propagules before they are used elsewhere; monitoring work</i></p>

sites to detect new invasions; and educating the public on the importance of preventing the spread of invasive nonnative plants.⁴⁰

For actual loss of habitat provide compensatory mitigation at 3 acres of newly created habitat for each acre of disturbed maritime chaparral: Choose a site with compacted, but not cemented soils; Collect seeds from the adjacent undisturbed maritime chaparral plant community; Adequately prepare the soil: do not rip the site, or limit ripping to one tine, to reduce the amount of disturbance to mycorrhizae and the seed bank; Use a backhoe bucket to dig holes for plants if soil is too hard for hand tools; Add collected seeds to enrich the seed bank; Plant mainly coyote bush about eight feet apart or according to its spacing in adjacent mature maritime chaparral; Cover soil with mulch or chipped chaparral; Control weed growth; Allow chaparral to mature through a combination of seed bank sprouting, volunteer growth, and lateral growth of adjacent chaparral.

Monitoring Protocol And Success Criteria For Mitigation:

- 1. Collect baseline data on the site, including a) Soil) Soil seedbank - species diversity, seed numbers, spatial distribution data; b) Vegetation) Vegetation community data - what does the community look like right now: species cover and distribution/density data; c) Animal) Animal data - what animals are using the habitat in what numbers; d; d) Soil) Soil microbial data - what diversity of fungi, etc., are using the site.*
- 2. Identify a reference ecosystem. Using the baseline data above, identify a similar protected area maritime chaparral ecosystem for setting restoration goals and monitoring the success of the restoration site.*
- 3. Recreate 1a - d above on the selected restoration site.*
- 4. Restore plant and animal communities to within 10% of the species diversity and density of the site that was impacted.*
- 5. Monitor annually for 5 years. Implement mid-course maintenance or remediation corrections if necessary. Compare the restoration site with the reference site identified at the outset of the permit.*

Buffer Or Setback Requirements: *Locate and cluster development as far from maritime chaparral as possible. Locate development in a manner that leaves as large, continuous tracts of open space as possible to allow for regeneration of chaparral and to allow for management measures, such as prescribed burning to occur.*

Types of Uses Allowed in The Buffer: *Habitat restoration and enhancement; nature study; limited public access*

⁴⁰ Bossard, Carla C., John M. Randall, and Marc C. Hoshovsky, eds. *Invasive Plants of California's Wildlands*, Berkeley, CA: University of California Press, 2000.

Mitigation Measures Required For New Development Adjacent To or Nearby the Habitat to Prevent Adverse Impacts: *Native landscaping; removal of exotics; containment of pets; monitoring of habitat over time to ensure against its degradation (in addition to other mitigation measures above)*

Agencies To Consult With: *U.S. Fish and Wildlife Service, California Department of Fish and Game, California Coastal Commission, Elkhorn Slough Foundation, California Native Plant Society*

Actions To Take: *Prepare an overall maritime chaparral conservation plan. Prescribed burning with any follow-up erosion control using deep-rooted native perennial grasses. Experimental vegetation cutting where prescribed burning is not possible, based on latest scientific literature.⁴¹ Weed control through removal of invasives and landscaping with native vegetation.*

Reference Documents:

Franklin, Scott. 1993. "Chaparral management techniques: An environmental perspective," *Fremontia* 21, no. 4:21-24.

D'Antonio, C.M., D.C. Odion, and C.M. Tyler. 1993. "Invasion of maritime chaparral by the introduced succulent *Carpobrotus edulis*: the roles of fire and herbivory," *Oecologia* 95:14-21.

Griffin, J. R. 1978 "Maritime chaparral and endemic shrubs of the Monterey Bay Region," *Madroño*, pp. 65-112.

Holl, K.D., H.N. Steele, M.H. Fusari, and L.R. Fox, 2000, "Seed banks of maritime chaparral and abandoned roads: potential for vegetation recovery," *Journal of the Torrey Botanical Society* 127(3), pp 207-220.

Holland, R.F. 1986. *Preliminary Descriptions of the Terrestrial Natural Communities of California*. The Resources Agency, California State Department of Fish and Game, Natural Heritage Division, Sacramento.

Shelly, John R., Pam Weiant, Frank C. Beall, Dorothy Mockus Lubin, and Carol Rice, 1998. *Assessment of urban/wildland biomass utilization & disposal options*. University of California Forest Products Laboratory. Database on-line. <http://www.prefire.ucfpl.ucop.edu/biomass/biomsttl.htm>.

Smith, Douglas, Bob Curry, Donald Kozlowski, Regina Williams, Fred Watson, Leslie Turrini-Smith, and Wendi Newman, 2002. *Watershed and Riparian Assessment Report (WRAR)*: Bureau of Land Management, Former Fort Ord, Monterey County, California. Seaside, CA: The Watershed Institute. Database on-line. <http://home.csUMB.edu/s/smithdouglas/world/wrar/wrarpage.html>.

⁴¹ To date, the scientific verdict is not definitive as to whether cutting is appropriate; conclusions are clear that burning is more appropriate.

Van Dyke, E. 2000. Maritime Chaparral Transition in the Prunedale Hills. Page 21. Environmental Studies. University of California at Santa Cruz, Santa Cruz, CA.

Van Dyke, E., and K. D. Holl, 2001. "Maritime chaparral community transition in the absence of fire," *Madroño* **48**:221-229.

Wells, P. V. 1962. "Vegetation in relation to geological substratum and fire in the San Luis Obispo Quadrangle, California," *Ecological Monographs* **32**:79-103.

For additional resources and more information regarding the ecology and conservation of California's maritime chaparral community, see bibliography located at <http://www.elkhornslough.org/CTP/maritimechaparral/marichapbib.htm>

b. Issue SH-29: Protection of Monterey Pine Forest Habitat

(1) Overview

This subchapter addresses the following concern identified through issue scoping: **Ensure that Monterey pine forest habitat is protected and allowed to thrive.**

Monterey pine forest habitat is one of the most significant coastal resources found in Monterey County. Native Monterey pines are considered a sensitive species (CNPS 1B), and indigenous Monterey pine forest habitat occurs in only five locations in the world, three of which are in the California coastal zone (Ano Nuevo, Monterey Peninsula, Cambria). The historic extent and range of Monterey pine was about 18,000 acres on the Peninsula, limited to coastal areas typified by summer fog, poor soils, and mild temperatures. Other rare, threatened, or endangered species also are associated with the Monterey pine forest, which further underscores its importance as a limited and unique coastal habitat type.

The certified Monterey County LCP recognizes the sensitivity of Monterey pine forest, and some Monterey pine forest areas in the *Carmel* and *Del Monte Forest LUP* segments are identified as ESHA, including specific associations with Bishop Pine and Gowen Cypress. Land use plan policies and related IP ordinances also include a variety of Monterey pine standards, including requirements to protect Monterey pine forest ESHA, to minimize impacts to the habitat and scenic resource values of Monterey pine, and to avoid, minimize, and mitigate tree cutting. The primary mechanism for protection of Monterey pine is the requirement that a forest management plan be prepared for each parcel at the time an individual development, including only tree cutting, first impacts the sensitive habitat on the parcel.

Since certification of the LCP in 1988, significant new knowledge about Monterey pine and the high sensitivity of this species and its habitat has been developed. This includes scientific studies of the

genetics of Monterey pine, as well as the ecology of Monterey pine forest habitat and its various subtypes. On the Monterey Peninsula, the native pine forest has been classified into an “ecological staircase,” and new, more focused conservation strategies for Monterey pine forest habitats have been developed. Environmental circumstances have changed as well. Most important, since the LCP was certified the species has been placed under significant new stress by the emergence of a pine pitch canker epidemic. New development approved and built in the 15 years since LCP certification has also continued to impact Monterey pine forest habitat. Analysis of LCP implementation reveals that cumulatively, significant numbers of Monterey pines have been removed through individual developments. In Del Monte Forest, some areas of pine forest habitat have been further fragmented and degraded through residential subdivision and home construction, and major development proposals are pending that would result in significant impacts to large, intact, ecologically-connected acreages of Monterey pine forest habitat.

In light of new knowledge, changed environmental circumstances, and continuing development impacts on Monterey pine forest, it is clear that higher levels of protection for this environmentally sensitive habitat area are needed. The LCP needs to be updated to assure that Monterey pine forest habitat is protected consistent with the Coastal Act. In particular, the LCP needs to be amended to clarify that Monterey pine forest habitat should be treated generally as ESHA unless site-specific circumstances and biological review show otherwise. Significant intact stands of Monterey pine remain in the Carmel and Del Monte Forest areas, and at the northern extremity of the Big Sur Coast area. All of these stands need to be consistently designated and protected as ESHA. Factors to consider in identifying Monterey pine forest ESHA include extent of the habitat, degree of fragmentation, health and relative degradation of the canopy and understory, and the relative uniqueness and diversity of the habitat. On the other hand, some occurrences of Monterey pine might be so fragmented, isolated, degraded or otherwise not functioning as natural habitat that it would not be reasonable to characterize them as ESHA as defined by the Coastal Act.

The LCP also needs to be updated to reflect our improved understandings of Monterey pine as an environmentally sensitive forest habitat or biological community, not simply a sensitive tree species that is also a scenic resource. The current LCP has strong tree protection and mitigation standards, but it also allows tree removal pursuant to a forest management plan unless an area is specifically identified as ESHA. The policies do not adequately address the need to identify Monterey pine ESHA, focusing instead on the identification of “significant trees” and requiring mitigation through planting of new trees.

Given our current understandings of Monterey pine forest ecology, the regulatory emphasis should be shifted to stress a strategy of preservation of suitable growing areas (i.e., habitat areas), rather than the current strategy of protecting (or replanting) individual trees. Also, strengthened LCP policies are needed to clearly prohibit all non-resource dependent development within identified Monterey pine forest ESHA. Finally, the LCP should be updated to provide a framework for more comprehensive Monterey pine forest habitat management. This should include updated policies, standards, and management measures to address long-term preservation of identified habitat,

protection of genetic diversity, management of pitch canker, new development and redevelopment within the forest canopy, and restoration of suitable habitat areas or currently degraded habitats.

Although analysis of this issue with respect to implementation of the LCP focuses on Del Monte Forest, the substance of the recommendations are applicable to other areas with native Monterey pine forest, including the Carmel and Big Sur Areas of Monterey County. This analysis also supports some of the general ESHA recommendations mentioned in Section C.2 1, such as the need for a clearer process of ESHA identification.

(2) Resource Issue Background

As mentioned in the overview, significant changes concerning Monterey pine have occurred since certification of the LCP in 1988. This section summarizes the resource background for understanding the need to improve the protection of Monterey pine forest habitat.

Pine Forest Habitat Characterization

Distribution and Range

Native Monterey pine (*Pinus radiata*) forest is restricted to five locations, three in California and two on islands off the coast of Baja California. The three California populations are geographically isolated and display genetic differences, as well as varying degrees of disease resistance.⁴² Each stand is restricted to coastal areas typified by summer fog, poor soils and mild temperatures. Although there is some uncertainty concerning the precise historical distribution of these stands, it is clear that all of them, with the exception of perhaps the Año Nuevo stand, have suffered from extensive losses and fragmentation due to development over the last 50 years.

The largest area of native Monterey pine forest occurs in Monterey County. A recent estimate by Jones and Stokes put the historical extent of Monterey pine forest on the Monterey peninsula at about 18,000 acres.⁴³ The present extent of pine forest in Monterey County, though, is greatly diminished. In 1994, Huffman and Associates estimated that 6,900 acres of native Monterey Pine stands remained.⁴⁴ In 1996, Jones and Stokes estimated that about 9,400 acres of “Monterey pine with natural understory” remained.⁴⁵ Within the coastal zone, pine forest occurs primarily in Del Monte Forest. In general, the vast majority of the Del Monte Forest segment, which covers approximately 4,500 acres, was once pine forest.⁴⁶ As shown in the Table SH-29a, though, only about 1881 acres or approximately 42% of the Del Monte Forest in the coastal zone was identified as “undeveloped” pine forest by Jones and Stokes in 1996.⁴⁷ The remainder of the historic forest has

⁴² California Native Plant Society, “A Petition to the State of California Fish and Game Commission,” August 1999.

⁴³ Jones & Stokes Associates, Inc., *Monterey Pine Forest Ecological Assessment: Historical Distribution, Ecology, and Current Status of Monterey Pine*, September 1994.

⁴⁴ Huffman and Associates, Inc., *An Evaluation of California’s Native Monterey Pine Populations and the Potential for Sustainability*, February, 1994.

⁴⁵ Jones & Stokes Associates, Inc., *Monterey Pine Forest Conservation Strategy Report*,. December 1996.

⁴⁶ See, for example, Huffman and Associates, Id. Figure 3; and Jones and Stokes, Id.

⁴⁷ Jones & Stokes Associates, Inc., *Monterey Pine Forest Conservation Strategy Report*, December 1996. Undeveloped areas are those that retain the native pine forest understory.

been developed into uses such as golf courses and residences. Map SH-29a illustrates the distribution of Monterey pine in various categories and other land uses as of 1996.

Habitat Associations

In addition to having a limited geographic distribution and range, Monterey pine forest supports numerous unique plant associations with species assemblages that reflect variation in soil, slope, elevation, moisture, and distance from the ocean. Thus, the pine forest moderates local climate conditions and provides habitat for a variety of endemic plant and wildlife species. As of 1999, at least nineteen special-status plant species and seventeen special-status wildlife species were associated with Monterey pine forest on the Monterey peninsula (See Tables SH-29b and c).⁴⁸ Significantly, a number of these species have been identified as having a special status (and thus in need of heightened protection) since certification of the LCP, and only ten of them are explicitly identified in the certified LCP as sensitive species that might indicate the presence of environmentally sensitive habitat areas (see below). And as discussed in more detail below, significant new knowledge has been developed about the unique subtypes of Monterey Pine forest habitat and associated biotic communities since LCP certification.

Table SH-29a. Monterey Pine Forest Areas and Other Land Uses in Del Monte Forest Planning Area in 1996.^a

Land Classification	Description	Acres
<i>Monterey pine</i> -- Undeveloped	Monterey pine forest with natural or relatively undisturbed understory	1881
<i>Monterey pine</i> -- Rural	Monterey pine forest with “rural” development underneath, lots greater than 1 acre	567
<i>Monterey pine</i> -- Suburban	Monterey pine canopy, usually over 20% cover with structures and yards underneath	634
Scattered <i>Monterey pine</i> -- Urban	Scattered Monterey pine, up to 20% canopy cover (golf course, urban parks)	53
Sparse <i>Monterey pine</i> -- Urban	Sparse Monterey pine (mostly street trees)	46
Other Habitat and Shoreline Areas	Includes Bishop Pine, grasslands, Monterey Cypress and Pygmy forest, riparian areas, coastal dunes and shoreline areas (some development)	505
Other Developed Areas	Includes other urban development (golf courses, landscaped areas, etc.) with no Monterey pine	802
TOTAL		4488

^a Derived from data reported in Jones & Stokes, *Id.* Note that the Jones and Stokes categorizations of residential density (e.g., “rural”, “suburban”) do not exactly correspond to terminology in the County zoning ordinance and other LCP provisions.

⁴⁸ California Native Plant Society, “A Petition to the State of California Fish and Game Commission,” 1999.

Table SR-29b. Special-Status Plant Species Known or with Potential to Occur in Monterey Pine Forest on the Monterey Peninsula of California

Scientific Name	Common Name	Rare/Threatened or Endangered Status (Listing Date) ^a		
		Federal	State	CNPS
<i>Allium hickmannii</i>	Hickman's onion			CNPS 1B
<i>Arctostaphylos pumila</i>	Sandmat manzanita			CNPS 1B
<i>Arctostaphylos hookeri</i> ssp. <i>Hookeri</i>	Hooker's manzanita			CNPS 1B
<i>Arctostaphylos montereyensis</i>	Monterey Manzanita			CNPS 1B
<i>Ceanothus cuneatus</i> var. <i>rigidus</i>	Monterey ceanothus			CNPS List 4
<i>Cordylanthus rigidus</i> var. <i>littoralis</i>	Seaside bird's-beak		Endangered	CNPS 1B
<i>Cupressus goveniana</i> ssp. <i>goveniana</i>	Gowen cypress	Threatened (1998)		CNPS 1B
<i>Cupressus macrocarpa</i>	Monterey cypress			CNPS 1B
<i>Ericameria fasciculata</i>	Eastwood's ericameria			CNPS 1B
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Wedge-leaved horkelia			CNPS 1B
<i>Lomatium parvifolium</i>	Small-leaved lomatium			CNPS List 4
<i>Malacothamnus palmeri</i> var. <i>involutus</i>	Carmel Valley Bush Mallow			CNPS 1B
<i>Malacothrix saxatilis</i> var. <i>arachnoidea</i>	Carmel Vally Malacothrix			CNPS 1B
<i>Potentilla hickmannii</i>	Hickman's cinquefoil	Endangered (1998)	Endangered	CNPS 1B
<i>Pinus radiata</i>	Monterey pine			CNPS 1B
<i>Piperia yadonii</i>	Yadon's rein orchid	Endangered (1998)		CNPS 1B
<i>Piperia michaelii</i>	Michael's Rein Orchid			CNPS List 4
<i>Trifolium trichocalyx</i>	Monterey clover	Endangered	Endangered	CNPS 1B
<i>Trifolium polyodon</i> (phase of <i>Trifolium Variegatum</i>)	Pacific Grove clover		Rare	CNPS 1B

^a CNPS= California Native Plant Society; listing categories: CNPS 1B = "List 1B species: rare, threatened or endangered in California and elsewhere;" List 4 = "List 4 species: plants of limited distribution that may be considered rare under CEQA." Listing date shown in parenthesis where information was available.

Table SR-29c Special-Status Wildlife Species Known or with Potential to Occur in Monterey Pine Forest on the Monterey Peninsula of California (c. 1999).

Scientific Name	Common Name	Rare/Threatened or Endangered Status (Listing Date) ^a		
		Federal	State	CDFG
<i>Sorex ornatus salarius</i>	Monterey ornate shrew			SSC
<i>Neotoma fuscipes luciana</i>	Monterey dusky-footed woodrat			SSC
<i>Taxidea taxus</i>	American badger			
<i>Accipiter striatus</i>	Sharp-shinned hawk			SSC
<i>Accipiter cooperi</i>	Cooper's hawk			SSC
<i>Aquila chrysaetos</i>	Golden Eagle			SSC
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	De-listed	Endangered	SSC
<i>Falco columbarius</i>	Merlin			SSC
<i>Cypseloides niger</i>	Black swift			SSC
<i>Rana aurora draytonii</i>	California Red-legged frog	Threatened (1996)		SSC (1994)
<i>Clemmys marmorata pallida</i>	Southwestern pond turtle			SSC (1994)
<i>Euphilotes enoptes smithi</i>	Smith's Blue butterfly	Endangered		SSC
<i>Antrozous pallidus</i>	Pallid bat			SSC (2000)
<i>Phrynosoma coronatum frontale</i>	California horned lizard			SSC (1994)
<i>Anniella pulchra nigra</i>	California black legless lizard			SSC (1994)
<i>Anniella pulchra pulchra</i>	Silvery legless lizard			SSC (1994)
<i>Danaus plexippus</i>	Monarch butterfly			

^a CDFG: SSC = Species of Special Concern. Listing date shown in parenthesis where information was available.

Pine Ecology

Effective protection of Monterey pine forest habitat depends in part on understanding its particular ecology. Monterey pine is a closed-cone species. Trees have both male and female cones, and pollen is carried on the wind from male to female cones on the same or different trees. Individual trees will produce hundreds of thousands of seeds, which may be released on hot, dry days. Closed-coned species are typical in fire-influenced forest habitats. On a very hot day or in response to fire, the cones open and release their seed. Following a light ground fire, a carpet of seedlings can be found beneath the mature trees after the first post-fire winter rains. On the Monterey peninsula, reproduction is typically most vigorous in recently burned areas, and weakest in the areas where fire-suppression occurs (i.e., the areas that have been divided and developed with residences). In

manicured, landscaped yards there is a significantly reduced chance for pine reproduction. Animals such as jays, mice and squirrels also may distribute seeds. In many locations, pine seeds are present at all times, waiting to germinate under the appropriate environmental conditions. The long-term health of pine forest habitat, of course, depends on the availability of appropriate surfaces to allow reproduction and adaptation to local environmental conditions.⁴⁹

Characterization of Pine Forest Subtypes

One of the most significant changes in knowledge about Monterey pine since LCP certification has been the identification and evaluation of numerous unique subtypes of Monterey pine forest. The forest develops different characteristics as a result of soil and climatic conditions found on geomorphic surfaces of different ages, origins, and locations.⁵⁰ In Del Monte Forest, four major soil types support Monterey pine: marine terrace deposits, dunes, alluvial deposits, and soils developed on pre-Quaternary shale and granite. In addition, six distinct marine terraces of differing ages can be distinguished, and the dunes can be divided into three age categories, each with genetically distinct pine populations. These age differences give rise to the “Monterey ecological staircase,” made up of at least eleven distinct subtypes of Monterey pine forest (Exhibit SH-1).

Similar to the Mendocino “ecological staircase,” each geomorphic surface supports different combinations of soils and vegetation. The distribution of species varies among the surfaces, as does the characteristics and presence of Monterey pine. The following is a brief and generalized description of the subtypes of forest habitat that occur on each of the four soil types (see Map SH-29b for locations).⁵¹ Table SH-29d, below, summarizes the historic and present acreage of each geomorphic Monterey pine habitat surface in the undeveloped areas of the Monterey peninsula and in the Del Monte Forest planning area of the coastal zone as identified by Jones and Stokes in 1996. As shown, other than the first marine terrace, the remaining pine forest habitat areas in the coastal zone range from as little as 6 acres on the second marine terrace, to as much as 500 acres on granitic surfaces.

⁴⁹ See generally, Jones & Stokes, *Monterey Pine Forest Ecological Assessment: Historical Distribution, Ecology and Current Status of Monterey Pine*, September 1994 and Rogers, Deborah L., *In Situ Genetic Conservation of Monterey Pine (Pinus radiata D. Don): Information and Recommendations*, September 2002, University of California.

⁵⁰ Jones & Stokes Associates, Inc., *The Monterey Ecological Staircase: The Nature of Vegetation and Soils on Different Geomorphic Surfaces on the Monterey Peninsula with an Emphasis on Monterey Pine Forest*, September 1994 and Jones & Stokes Associates, Inc., *Monterey Pine Forest Conservation Strategy Report*, Final Report, December 1996, pp. 1-4.

⁵¹ The acreages and percentages indicated in this section are for the total Monterey peninsula, not specifically the Del Monte Forest segment of unincorporated Monterey County.

Table SH-29d. Monterey Pine Acreages on the Ecological Staircase

Geomorphic Surface	Pine Forest on the Monterey Peninsula and Pt. Lobos			Pine Forest in Del Monte Forest Coastal Zone Planning Area	
	Historic Acreage	Remaining Undeveloped	Percent	Remaining Undeveloped	% of CZ Acreage
Marine Terrace 1	0	43	NA	0	0
Marine Terrace 2	1,087	170	16%	6	1
Marine Terrace 3	1,339	161	12%	138	8
Marine Terrace 4	1,547	318	21%	66	4
Marine Terrace 5	1,277	457	36%	303	17
Marine Terrace 6	261	82	31%	81	4
Marine Terrace, Other	325	219	67%	0	0
Youngest Dunes	0	15	NA	12	0
Middle-aged Dunes	828	123	15%	80	4
Oldest Dunes	1,168	229	20%	165	9
Inland Shale	5,965	4772	80%	300	17
Granitics	2,419	1194	49%	501	28
Other Surfaces	1,553	1430	92%	145	8
Undetermined Surfaces	555	242	44%	0	0
TOTALS	18,324	9,412	51%	1,797	100

Marine Terrace Deposits – Six marine terraces occur within this sub-group of geomorphic surfaces, and each is mantled by marine and non-marine deposits of varying ages. The youngest terrace occurs nearest to the ocean (Marine Terrace 1) and each terrace beyond Terrace 1 increases in elevation and distance from the coast in a “staircase” fashion. The intertidal coastal terrace at sea level is Terrace “0” and is cut into bare granite or other bedrock and supports tidepool plants and animals. The extents of these six terraces are illustrated in Figure SH-29b.

On Marine Terrace 1 is found the youngest sand dunes. Its elevation ranges from 10 to 40 feet. Only 43 acres of forest on this surface remain. Marine Terrace 2 generally ranges from 40 to 120 feet in elevation and is covered by the oldest sand dunes. Marine Terrace 3 generally ranges in

elevation from 140 to 220 and is divided into segments by numerous channels that have eroded canyons and formed riparian corridors. A large section above Spanish Bay is covered by older sand dunes. At least seven special status species are associated with this subtype. Marine Terrace 4 generally ranges in elevation from 240 to 300 feet. Only 20% of the historical extent of this forest remains in tact. Nine sensitive species are associated with forests on this terrace. Marine Terrace 5 generally ranges in elevation from 320 to 540 feet. This terrace is cut by stream canyons but is not covered by old sand dunes. Monterey pine forest on Terrace 5 supports open canopy of Monterey pine with coast live oak. The pines are stunted, becoming flat-topped at 50 to 60 feet tall. Monterey pine and Bishop pine forests are present in open stands. There are ten sensitive species associated with Monterey pine forest on this terrace. Only 37% of the historical extent of this forest remains in tact. Finally, Marine Terrace 6 generally ranges in elevation from 600 to 800 feet. The terrace supports Monterey pine forest with an open overstory. The pines are stunted at about 40 feet (flat topped). Some scattered Bishop pines are also present. Eight sensitive species are associated with this forest. Only 31% of the historical extent of this forest remains in tact.

Dunes – Sand dunes of three different ages have accumulated on portions of Terraces 1 through 4. The youngest dunes are the active dunes in the process of stabilizing and vegetating. Most areas of the active dunes (or recently active) occur near the shoreline along the northwest side of the Monterey Peninsula. Old Monterey pine trees occasionally occur at the inland edge of dunes. It is not known if these established naturally. No natural regeneration has been observed. There are only 15 acres of this forest type still in tact.

Middle-aged dunes occur inland of the youngest dunes and Terrace 1. The soil characteristic differs from that supporting young dunes in that there is an accumulation of organic matter to a depth of 20 to 48 inches. This results in increased water-holding capacity and increased fertility. The Monterey pines achieve full height in multistoried stands. Only 15% of the historical extent of this forest remains in tact.

The oldest dunes found on the Monterey Peninsula generally occur inland of the middle-aged dunes except in the Monterey Peninsula Country Club Golf Course where there is a transition from Terrace 1 to the oldest dunes. As with the pine forest on middle-aged dunes, the forest is multistoried. However, the circumference of the trees tends to be smaller than the pines found on middle-age dunes. Monterey pine seedlings tend to be sparse on this geomorphic surface and the duff layer is thick. Only very small isolated areas remain in a semi-natural condition. Only 20% of the historical extent of this forest type remains in tact.

Alluvial Soils – These soils are the typical soil series of canyon riparian areas separating marine terraces and dune segments. All are sandy alluvium characterized by irregular accumulations of organic matter in the soil profile as a result of flood deposition. These soils are found on what is considered an inland geomorphic surface. Monterey pine grows to full size and the understory is usually a more diverse assemblage than on adjacent terraces.

Soils developed on Shale and Granitic Bedrock – Like the alluvial deposits, these soils are found inland. Shale bedrock soils are strongly acidic, fine textured, have good soil structure, are moderate fertile, and have water-holding capacity. The Monterey pine forest on shale supports full-sized Monterey pines about 80-100 feet. This forest subtype is the largest with an extent of 4,722 acres, representing 79% of the historical extent of this forest. The Monterey pine forest on soils of granitic bedrock is well developed and pines are full sized. Approximately 1,194 acres of this forest subtype remains in tact, representing 49% of the historical extent.

The scientific evidence developed in recent years shows how Monterey pine has evolved over time to adapt to the unique characteristics that these soils and geomorphic surfaces present, enabling the species to survive and respond to varying growing conditions. Tree stands growing on each soil type contains genetic diversity that allows Monterey pine to grow in unique situations. Thus, one of the primary conclusions of the Jones and Stokes/Department of Fish and Game ecological staircase study is that:

*Monterey pine forest cannot be treated as a indivisible entity. Strong and subtle differences can be found between the Monterey pine forests growing on different geomorphic surfaces and soils.*⁵²

As discussed later, the implications of this study speak directly to the Coastal Act mandate to protect environmentally sensitive habitat areas, as it shows how the Monterey pine is not only a sensitive and rare species generally, but that subtypes of Monterey Pine are themselves rare and sensitive and eligible for protection as environmentally sensitive habitat areas.

Threats to Resources

Monterey pine habitat is threatened primarily by the direct loss of habitat due to development, soil erosion (e.g., from road grading, recreational overuse), fire suppression, and the introduction of invasive exotic plants (including broom, pampas grass, acacia, and eucalyptus.). In addition, fragmentation, pine pitch canker, genetic contamination, and loss of genetic diversity threaten the forest.

Development Impacts

New development may result in the physical loss of trees as well as impacts to the overall forest habitat and species therein, including loss of habitat area for forest regeneration. There remain approximately 120 vacant forested residential parcels in Del Monte Forest and about 20 larger forested parcels that are currently zoned for up to approximately 800 more homes, although none of these areas are currently subdivided.⁵³ According to County and Jones and Stokes GIS data, there

⁵² Jones & Stokes Associates, Inc., *The Monterey Ecological Staircase: The Nature of Vegetation and Soils on Different Geomorphic Surfaces on the Monterey Peninsula with an Emphasis on Monterey Pine Forest*, September 1994.

⁵³ In November 2000, County voters approved Measure A which would greatly lower potential maximum buildout currently shown in the LCP and increase areas designated Open Space, but, in addition to infill on vacant lots, still allow up to 77 residential units on sites F, I, P, Q, Y; up to 12 units of employee housing at Spanish Bay; 24 golf suites in the Spyglass-Cypress planning area; a golf course at the present location of the Pebble Beach Equestrian Center; a driving range, golf teaching center, and additional parking

were approximately 28 parcels greater than one acre that (as mapped in 1994) have Monterey pine forest in an “undeveloped” state that are potentially at risk from development. Additional vacant parcels with Monterey pine also exist in areas characterized by rural and suburban levels of development.

Even when trees are retained where new development occurs, disturbance to the soil and the herbaceous understory may occur from ancillary development on site. Root structures may also be impacted. The Monterey pine root system can extend up to 30 or 40 feet.⁵⁴ Additional trees may be cut if they are considered dangerous, unaesthetic, or otherwise undesirable on a developed residential parcel. Moreover, development on the forest edge may prevent the natural expansion and contraction of the forest over time in response to climate change. Recent research suggests that maintaining areas for the pine forest to ebb and flow in response to local environmental factors and climate is essential to conserving the genetic diversity of the Monterey pine forest.⁵⁵

Monterey pine forest habitat is also impacted by fire suppression. This has contributed to forest crowding and reduced forest vigor. Other indirect impacts from new development include the introduction of invasive exotic plants, light pollution, and noise pollution. These influences can reduce the health, vigor and biological productivity of Monterey pine forest. There is concern about the health and viability of the native Monterey pine forest due to the threat of genetic destabilization from the introduction of hybridized pine stock. Future Monterey pine stocks may be genetically altered through cross-pollination. This could result in a loss of disease resistance, drought tolerance or other more subtle localized survival factors.

Pine Pitch Canker

One of the most significant changed circumstances since certification of the LCP has been the emergence of the threat to Monterey pine forest from the pine pitch canker epidemic. Pitch canker was first detected in Monterey pine in California in 1986, and confirmed on the Monterey Peninsula in April, 1992. The California Department of Forestry characterizes the threat of pitch canker to all native Monterey pine stands as “severe.” In 1997, the State Board of Forestry defined a Pitch Canker Zone of Infestation, which includes all coastal counties from Mendocino to Mexico. No treatment for infected trees is currently available.

When the disease was first detected in California in 1986, it was thought that the forest would be incapable of surviving. Since that time, though, more has been learned about the genetic diversity and potential resistance of the Monterey pine species to pitch canker. For example, it has been recognized that there is variability in susceptibility to pitch canker in Monterey pine, indicating that

near Spanish Bay; and a new equestrian center in former quarry site of the upper Sawmill Gulch area.. This Measure has not yet been submitted to the Coastal Commission for review for consistency with the Coastal Act. See also *County Of Monterey Staff Analysis Of Measure “A” The Del Monte Forest Initiative*, September 2000 on County website: http://www.co.monterey.ca.us/pbi/major/pbc/DMF_Analysis.PDF.

⁵⁴ Jones & Stokes, *Monterey Pine Forest Ecological Assessment: Historical Distribution, Ecology and Current Status of Monterey Pine*, September 1994, p. 25.

⁵⁵ Rogers, Deborah L., *In Situ Genetic Conservation of Monterey Pine (Pinus radiata D. Don): Information and Recommendations*, September 2002, University of California.

some genetic resistance may exist.⁵⁶ It thus appears that it is critical to limit the spread of the fungus until a treatment is identified or disease-resistant stock is available. This is also true because there are different strains of pitch canker fungus. Although a small percentage of Monterey pine appears immune to the disease, only some of the causative pitch canker fungal species (*Fusarium subglutinans f. ssp. pini*), are currently present in California; and one of these strains or vegetative compatibility groups consists of over 50% of the California population of the pathogen. Thus, while infection-tolerant trees appear to be able to survive fungal infection, the disease has not been present long enough in California to evaluate long-term survivorship. Individual tree specimens that exhibit resistance to the one overwhelmingly prevalent strain might prove vulnerable to yet other strains that may become more widespread. As a result, the development of one or only a few lineages of disease resistant stock may not be sufficient to ward off the pitch canker threat.

While one goal for dealing with pitch canker within the Department of Forestry infestation zone is to slow disease spread, neither the State Board of Forestry nor CDF has the authority to impose and enforce quarantine on the movement of infected material. Researchers have thus recognized that it would clearly be beneficial to maintain maximum genetic diversity among Monterey pine in order to preserve those specimens that have shown some resistance to pitch canker disease. In addition, genetic diversity is important because it may provide opportunities for adaptation to local conditions such as the detrimental effects of human activities. At the ecosystem level, loss of genetic diversity of a population can have cascading effects throughout the system, increasing the risks to the community as a whole.⁵⁷

Overall, because the native range for Monterey pine is limited to the Monterey Peninsula and only four other locations in the world, it may be that the main hope for the survival of the endemic species is to maintain enough natural diversity within the native stands so that some trees will exhibit disease resistance or tolerance. These trees can be used to propagate new trees for stand repopulation and larger tracts of native pine forest can be preserved and managed so that natural regeneration can take place. Thus, until the nature of existing native pine forest immunity is understood, it is critical that the maximum genetic diversity within the native stands of Monterey pine be protected.

Responses to Threats

Since certification of the LCP, continuing impacts on the pine forest and the spread of pitch canker have led to a variety of responses to increase protection of the remaining pine forest. Discovery of the disease has led to the creation of the California Pitch Canker Task Force. The task force's mission is to develop short and long-term management guidelines for managing pitch canker in the Monterey pine forest, define research and management priorities for pitch canker, secure support for proposed activities, and allocate resources to implement guidelines and recommendations.⁵⁸

⁵⁶ Jones & Stokes, *Id.* 1996, p. 1-6.

⁵⁷ Rogers, Deborah L., *In Situ Genetic Conservation of Monterey Pine (Pinus radiata D. Don): Information and Recommendations*, September 2002, University of California, pg.2.

⁵⁸ http://frap.cdf.ca.gov/pitch_canker/task_force/mission.html

In 1996, the Department of Fish and Game published a conservation strategy for Monterey Pine based on the ecological assessments of Jones and Stokes. As discussed above, among other things, this strategy recognized the significance of the diversity of pine forest habitat on the ecological staircase, and proposed a conservation strategy for remaining pine forest areas based on an evaluation of various characteristics of these areas.

In addition to these activities, a recent comprehensive report on *in situ* genetic conservation of Monterey pine presents 18 recommendations for improving conservation of the genetic diversity, and thus health of this limited species. This includes recommendations to avoid further significant losses of genetic diversity within each of the populations of Monterey pine, and to avoid further fragmentation of remaining Monterey pine forests.⁵⁹ The report observes the following with respect to preserving genetic diversity of Monterey pine:

Genetic diversity underlies all biological diversity. It allows local populations of a species to adapt to a variety of niches. It provides evolutionary flexibility for the species to adjust in the long term in response to changing climates and other conditions. Thus, both spatially and temporally, genetic diversity provides a species with the potential to adjust to environmental changes.

The report also concludes that maintaining areas for regeneration and adaptation of Monterey pine forest is important to conserving its genetic diversity and thus its sustainability over time, particularly as climate changes:

To have genetic reserves—perhaps including some lands adjacent to existing forests where possible—is particularly critical for the species because of the historically dynamic relationship between Monterey pine and climate. With climate change and other influences, Monterey pine populations are being severely challenged while having their historic suite of responses—including migration by dispersal—reduced.⁶⁰

In addition to increased scientific and conservation responses, Monterey pine has also received more formal recognition as a sensitive and rare species since certification of the LCP. Most significant, Monterey pine was listed by the California Native Plant Society (CNPS) as a “List 1B species” in 1994. List 1B species are those plants that the CNPS has judged to be rare, threatened, or endangered in California and elsewhere because they are “vulnerable under present circumstances or ... have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population... or their limited number of populations.”⁶¹ As stated by the CNPS, List 1B species meet the definitions of Threatened or Endangered found in Sections 2062 and 2067 of the California Endangered Species Act (CESA), administered by the California Department of Fish and Game Code, and are eligible for state listing under the CESA.

⁵⁹ Rogers, Deborah L., *In Situ Genetic Conservation of Monterey Pine (Pinus radiata D. Don): Information and Recommendations*, September 2002, University of California.

⁶⁰ Rogers, p. ix-x.

⁶¹ CNPS Inventory Overview, <http://www.cnps.org/rareplants/inventory/names.htm>.

The CNPS also uses a system called the R-E-D Code for sensitive species that indicates the overall level of conservation concern for any particular plant, based on its rarity, endangerment, and distribution. In the case of Monterey pine, the CNPS R-E-D code is 3-3-2 (with 3 indicating highest concern), because of its limited number of restricted occurrences (only 5 locations, 3 in California), serious endangerment in California, and its rarity outside of California (but for the small pine forest populations on Guadalupe and Cedros Islands off of Baja, the R-E-D code presumably would be 3-3-3). Thus, concern for the protection of Monterey pine is quite high. In recognition of the high conservation concern for Monterey pine, the species also was placed on the International Union for Conservation of Nature and Natural Resources (IUCN) Red List of Threatened Species in 1997.

The CNPS also adopted a policy statement on Monterey pine in 1995. Among other recommendations, this statement includes a recommendation to limit the removal of healthy Monterey pine to the minimum necessary:

*CNPS recommends that there should be no further removal of healthy, non-hazardous native Monterey Pine trees, except for minimal removal on existing lots of record and to meet fire safety requirements. Preservation efforts should be concentrated on stands 20 acres or larger and contiguous stands of smaller acreages that provide wildlife corridors, habitat connectivity, or occupy rare terrace soils.*⁶²

In 1999, the CNPS submitted a petition to the California Department of Fish and Game to list Monterey pine as a Threatened Species under the California Endangered Species Act in August 1999.⁶³ Although the petition was withdrawn later in that year, the CNPS Monterey chapter website indicates that resubmittal of the petition is possible, depending on the outcome of the new conservation and task force efforts that have begun to unfold, and that could potentially lead to heightened protection of Monterey pine forest.⁶⁴

Other groups concerned with protecting Monterey pine have formed since LCP certification also, out of recognition of the increased need to protect the species. The non-profit Monterey Pine Forest Watch has been working since 1992 to educate policymakers and the public about the many values of the Monterey Peninsula's rare native Monterey pine forest and to promote conservation of this threatened ecosystem. Monterey Pine Forest Pine Watch goals include working to ensure that the remaining undeveloped native Monterey pine forest in Monterey County receives strong protection under the provisions of the Monterey County General Plan. The organization has reviewed and provided extensive comment on the proposed 21st Century Monterey County General Plan update with respect to preservation of Monterey pine.

Finally, the Monterey Pine Forest Ecology Cooperative is a science-based support and advisory group that has been formed to advance the study of long-term conservation of the Monterey pine forest. Through scientific information exchange, the Cooperative assists in planning, management,

⁶² CNPS Policy on Monterey Pine Forest, Adopted March 1995, http://cnps.org/archives/monterey_pine.htm.

⁶³ California Native Plant Society, "A Petition to the State of California Fish and Game Commission," August 1999.

⁶⁴ Monterey Pine Update, <http://www.mbay.net/~cnps/consERVE.html>.

research, and educational efforts aimed at conserving the native Monterey pine forests. Its membership includes representatives of public agencies, private landholders and organizations, universities and nongovernmental organizations. The Cooperative provides a forum for Monterey pine forest managers and research scientists (especially ecological scientists) to discuss the application of science to the practical aspects of conservation management of native populations of Monterey pine and its associated ecosystem processes and species. Its objectives include recommending critical needs in Monterey pine forest research and furthering such research through scientific workshops and symposia, networking, assistance with grant proposals, and administration of a small grant program for graduate students. By bringing scientific knowledge to the management and conservation of native Monterey pine forests, the Cooperative hopes to improve awareness and understanding of the biology of Monterey pine forests.

(3) Local Coastal Program Provisions:

The *Del Monte Forest Land Use Plan* and Implementation Plan has provisions to protect the Monterey pine forest through land use designations and policies applicable to development. In general, the *Plan* recognizes the scenic, habitat, and water quality protection values of the Monterey pine forest.

Land Use Designations over Pine Forest

The *Del Monte Forest Land Use Plan* has three land use designation categories: residential, commercial, and open space. The intact Monterey pine forest in Pescadero Canyon is designated as Open Space. Several larger tracts of land, though, are designated for potential residential subdivision, and many of these are almost entirely intact Monterey pine forest (i.e., Planning Areas B, C, F, G, H, I, J, K, L, O, P, Q, R, S, U, V and Y).⁶⁵ As mentioned, there are also approximately 73 vacant smaller parcels designated for residential use. Similar to areas in other coastal segments, the LCP does place the larger tracts of lands under the B-8 resource constraint overlay, which does not allow intensification of development unless critical infrastructure constraints such as water supply, traffic, and sewage disposal capabilities are addressed.⁶⁶

⁶⁵ These tracts, with their acreage, are comprised of the following subtypes: B & C (57 ac): mostly dunes (Oldest dune 1); F (43.3 ac): granite and marine terrace 5; G (39 ac): marine terrace 6; H & I (75.5 ac): marine terrace 5 and granite; J (11.57 ac): marine terrace 3 and granite; K (11 ac): mostly marine terrace 3; L (23 ac): dunes (old dunes 2) and some alluvial; N (51 ac): mostly dunes (oldest dunes 2) and some marine terrace 3; O (20 ac): mostly marine terrace 3; P (34.3 ac): marine terrace 5 and granite; Q (45.45 ac): shale; R (75.6 ac): mostly marine terrace 5; some marine terrace 6, granite and shale; S (41.32 ac): mainly marine terrace 5 and shales; U (22.3 ac): marine terrace 3; V (26 ac): marine terrace 3; Y (20.4 ac): marine terrace 5. Tract S has since been subdivided and developed; see discussion of Macomber subdivision below.

⁶⁶ The corresponding B-8 zoning in *County Code* Section 20.42.030.H states:

1. The purpose of the "B-8" Zoning District is to restrict development and/or intensification of land use in areas where, due to water supply, water quality, sewage disposal capabilities, traffic impacts or similar measurable public facility type constraints, additional development and/or intensification of land use is found to be detrimental to the health, safety, and welfare of the residents of the area, or the County as a whole; or the purpose of this Section...;

Pine Forest Policies

The *Del Monte Forest LUP* contains the following policies applicable to protecting the native Monterey pine forest:

LUP Forest Resource Policy Guidance Statement: The natural beauty of the Del Monte Forest is one of its chief assets. The forest resource, in addition to its role in the areas natural environment, is a principal constituent of the scenic attractiveness of the area, which should be preserved for the benefit of both residents and visitors. The Forest is more than an aggregate of trees. It is home to the area's wildlife and serves to moderate climatic extremes. Therefore, long-term preservation of the forest resource is a paramount concern.

*Policy 31: The natural forested character of Del Monte Forest shall, to the maximum feasible degree, be retained, consistent with the uses allowed by this Plan. Accordingly, all tree removal, land clearing for development and forest management activities within the native forest areas covered by this Plan shall conform to LUP policies regarding water and marine resources, **environmentally sensitive habitat areas**, and scenic visual resources [emphasis added].*

Policy 32: Where LUP objectives conflict, preference should be given to long-term protection of the forest resource. When reviewing requests for tree removal environmental considerations shall include review of forest plant associations, native soil cover, and aesthetic values, as well as maintenance of the overall health of the stand. Conformance to OSAC maintenance standards shall be required in applicable areas. Forest-wide specific criteria for removal of Del Monte Forests native tree species are as follows:

...Monterey Pine: removal of any significant Monterey pine (living tree more than 12 inches in diameter) shall be in accordance with the forest management plan for that site. If no such plan has yet been approved for the site by the County or its designee, or an Open Space Advisory Committee Maintenance Standard prepared, such plan will be prepared prior to any non-emergency tree removal. On small parcels, a brief standardized format may be used for forest management plans. As a minimum standard of review, the content of the OSAC Plan Forest Maintenance Standard for Shepherds Knoll (Parcel No. 4) shall be adhered to wherever applicable.⁶⁷

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4. *Reclassification of an area from "B-8" zoning may be considered when the constraints existing at the time of placing "B-8" zoning on the area zoned "B-8" no longer exist and additional development and/or intensification of land use will not be detrimental to the health, safety, and welfare of the residents of the area, or the County as a whole.*

⁶⁷ These include trees >12" in diameter need a permit to be cut; large dead trees should be left in place; trees may be thinned to promote growth of neighboring trees; gaps in the forest of more than 30 feet between driplines should be planted with Monterey pine seedlings from the area; undergrowth clearing shall not disturb the ground surface and shall be sown with rye grass; and certain exotics will be eradicated. If a large number of trees are proposed for removal the overall unbroken appearance of the forest canopy shall not be altered. Retained trees that are close to the construction site must be protected from inadvertent damage by construction equipment through wrapping of trunks with protective materials, bridging or tunneling under major roots where exposed in foundation or utility trenches. Open fires for clearing are allowed within the forest management area as a fire

Policy 33: In reviewing requests for tree removal, land clearing and other development, preservation of scenic resources shall be a primary objective. Because of the regional significance of the forest resources, special consideration shall be given to the ridgeline silhouette, the corridors along Highway 68 and 17-Mile Drive, and the view from distant publicly accessible shoreline areas such as Pt. Lobos.

Policy 34: In considering potential development projects, project designs shall be required to minimize to the extent feasible the removal of vegetative cover or damage to soil resources. Land use concepts, which minimize removal, will be preferred. Retained trees that are located close to construction sites shall be protected from inadvertent damage by construction equipment through wrapping of trunks...

Policy 35: The natural soil cover shall be retained in place to the maximum extent possible. Grading and site preparation activities for new development shall incorporate design features to prevent soil erosion...

Policy 36: New residential development, including driveways and parking areas, shall be sited and designed to minimize cutting of trees... The clustering of single family homes in order to maintain the present character of the Del Monte Forest shall be encouraged... Native trees shall be replaced on the site at a rate of one tree of the same variety for each tree removed, except where it is demonstrated that this would result in an overcrowded, unhealthy environment...

Policy 39: No forestry Special Treatment Area (or portion thereof) shall be subdivided or converted to residential development unless both the Coastal Commission and State Board of Forestry first concur that such action does not constitute a conversion of coastal commercial timberland in a unit of commercial size. The landowner may request the removal of the STA designation from all or part of the areas where development is allowed by this LUP at any time following LCP certification.⁶⁸

County Code Section 20.147.050.B and Appendix B of Chapter 20.147 detail the requirements for forest management plans. Forest management plans are required for tree removal requiring a coastal permit and for development requiring a coastal permit, where the development includes native tree removal, regardless of tree size. Plans are to be completed by qualified professional foresters, selected from the County's list of consulting foresters at the applicant's expense. Forest management plans are to consist of a plot plan and forest maintenance plan that assesses impacts of development on the forest and alternatives to minimize impacts. They apply to the entire parcel even if tree removal is limited to only a portion of the parcel. They include an agreement for the property owner to minimize erosion, preserve natural habitat, and prevent forest fire. Removal of

management tool and under the direction of the CDF, pursuant to local fire ordinances. Except within the greenbelt area of a development (approximately 50' around the structure), irrigation within the forest management area will not be permitted.

⁶⁸ Many undeveloped pine forest tracts are designated as Special Treatment Areas.

Monterey pine less than 12 inches in diameter that is not associated with an activity that requires a coastal development permit can occur in the absence of a forest management plan.

LCP ESHA Definitions and Policies

In addition to the specific forest policies cited above, the *Del Monte Forest Land Use Plan* includes a general ESHA definition and corresponding policies to protect ESHA consistent with Coastal Act Section 30240. The *Del Monte Forest LUP* definition of Environmentally Sensitive Habitats closely tracks Coastal Act 30107.5:

“...[areas] in which plant or animal life or their habitats are rare or especially valuable due to their special role in an ecosystem. These include rare, endangered, or threatened species and their habitats; other sensitive species and habitats such as species of restricted occurrence and unique or especially valuable examples of coastal habitats...”

This definition is also reflected in the Monterey County *Coastal Implementation Plan*.⁶⁹ The plan also lists some “examples of terrestrial, aquatic, and riparian habitats” that were identified at the time of LCP certification as entirely or partially environmentally sensitive, and references a complete listing of examples in Appendix A of the plan. These are also generally shown on the Figure 2 ESHA map.

In terms of Monterey pine, “the endemic Monterey pine/Bishop pine association” is on the list of ESHA examples, as are remnant coastal dunes stabilized by Monterey pine. Figure 2 also generally shows these areas. Other areas of Monterey pine forest are not explicitly identified in the Appendix A list of examples, nor is its complete extent shown on Figure 2.⁷⁰ However, the LCP does

⁶⁹ County Code Section 20.06.440 defines ESHA as follows:

Environmentally sensitive habitat means an area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments. (See individual land use plan segments definitions for specific examples.)

County Code Section 20.147.020(H) further defines ESHA in the Del Monte Forest as follows:

Environmentally sensitive habitats: Environmentally sensitive habitat areas are those in which plant or animal life or their habitats are rare or especially valuable due to their special role in an ecosystem. These include rare, endangered, or threatened species and their habitats; other sensitive species and habitats such as species of restricted occurrence and unique or especially valuable examples of coastal habitats; riparian corridors; rocky intertidal areas; nearshore reefs; offshore rocks and islets; kelp beds; rookeries and haul-out sites; important roosting sites; and Areas of Special Biological Significance (ASBS).

In the Del Monte Forest area, examples of terrestrial, aquatic, and riparian habitats which have been determined to be entirely or in part environmentally sensitive include: the rare Monterey cypress and endangered Gowen cypress forest communities, the endemic Monterey pine/Bishop pine association, remnants of the indigenous coastal sand dunes, riparian corridors, wetlands, and sites of rare and endangered plants and animals associated with these and other habitats.

⁷⁰ The Carmel Area Land Use Plan’s approach to Monterey pine is slightly different. Based on the Land Use Plan’s statement that, “Since not all Monterey Pine Forest areas are environmentally sensitive habitat, the restrictions of these [ESHA] policies shall only apply where such forests are determined to be sensitive on a case by case basis,” County Code Section 20.146.040 directs:

acknowledge Monterey pine in various ways in the planning sub-area discussions. For example, in the Spanish Bay area, Monterey pine on dunes is mapped and identified as ecologically important as the climax species on dunes. In the Spy Glass area, Monterey pine on dunes is described and mapped. In the Middle Fork area, the LCP acknowledges that the entire area is forested with Monterey pine, albeit not as dense or vigorous as in some other areas. Reference is made to the need to protect certain clusters, and some areas of pine forest are mapped. Monterey pine forest is also acknowledged in association with mapped Gowen Cypress and Bishop pine forest. In the Pescadero area, some Monterey pine is again mapped, and the LCP acknowledges that the majority of pine here is planned to be protected in part because of its wildlife habitat values. With regard to the thirty-six sensitive species mentioned above that are associated with the Monterey pine forest, ten of these are listed in Appendix A of the *Land Use Plan* as examples of sensitive species and habitat known at the time of LCP certification.⁷¹

In addition to the definition of ESHA, the *Del Monte Forest Land Use Plan* contains various general policies to protect ESHA:

Policy 8: ...Within environmentally sensitive habitat areas, new land uses shall be limited to those that are dependent on the resources therein. Land uses immediately adjacent to environmentally sensitive habitat areas shall be compatible with long-term maintenance of the resource; development shall be sited and designed to prevent impacts, which would significantly degrade the protected habitat...

10. New subdivisions which create commitment to development immediately adjacent to environmentally sensitive habitat areas shall be allowed only at densities compatible with protection and maintenance of these resources. New subdivisions may be approved only where potential adverse impacts to environmentally sensitive habitats can be prevented. Conformance to the applicable OSAC maintenance standards shall be required wherever open space lands would be affected. No residential subdivision shall be allowed unless it is first demonstrated that, for each new residential lot, normal residential development, including driveway and utility connections, is feasible without damage to any environmentally sensitive habitat.

11. Contiguous areas of undisturbed land in open space uses shall be maintained wherever possible to protect environmentally sensitive habitat areas and associated wildlife values. To this end, development of parcels immediately adjacent to designated environmentally sensitive habitat areas shall be planned to keep development intensity

The sensitivity of Monterey Pine habitats in the Carmel area shall be determined on a case-by-case basis through the completion of a biological/botanical report for the project. Examples of sensitive Monterey pine forest include naturally occurring groves which: a.) function as habitat for rare or endemic plant or animal species; b.) have special value for wildlife due to the presence of snags suitable for cavity-dwelling species, or occurrence with Coast live oak, or native shrub understory; or c.) have high aesthetic value.

⁷¹ These are Sandmat manzanita, Gowen cypress, Monterey cypress, Eastwood's goldenfleece, Hickman's potentilla, Pacific Grove clover, Monterey clover, Hickman's cinquefoil, Monterey ceonothus, and Smith's blue butterfly.

immediately adjacent to the sensitive habitats as low as possible, consistent with other planning criteria (e.g., drainage design, roadway design, and public safety)....

12. Where development of any type, including subdivision of land for development purposes, is proposed in or near documented or expected locations of environmentally sensitive habitats, field surveys by qualified individuals shall be required in order to determine precise locations and to recommend mitigating measures to ensure protection of any sensitive species or habitat(s) present...

13. The protection of environmentally sensitive habitats shall be provided through deed restrictions or permanent conservation or scenic easements granted to the Del Monte Forest Foundation. Where developments are proposed within or near areas containing environmentally sensitive habitat, such restrictions or easements shall be established through the development review process. Where development has already occurred in areas supporting environmentally sensitive habitat, property owners should be encouraged to voluntarily grant conservation or scenic easements to the Del Monte Forest Foundation. Except in the case of voluntary easements, each instrument for effecting such restriction or easement shall be subject to approval by the County as to form and content; shall provide for enforcement, if need be, by the County or other appropriate enforcement agency; and shall name the County as beneficiary in event the Foundation ceases or is unable to adequately manage these easements for the intended purpose of natural habitat preservation.

14. Near environmentally sensitive habitat areas, the removal of indigenous vegetation and land disturbance (grading, excavation, paving, etc.) shall be restricted to the minimum amount necessary to accommodate development...

Exceptions

Finally, the LCP has some exceptions to applying the ESHA and Monterey pine policies. To prevent an unconstitutional taking, a legal parcel that otherwise should not be developed could be allowed a modest home under *County Code* Section 20.02.060.B, which reads in part:

An exception to the finding required in Section 20.02.060.A [of consistency with the LCP] may be considered by the Board of Supervisors on appeal, if it is found that the strict application of the area land use plan policies and development standards of this ordinance denies all reasonable use of the subject property. The exception may be granted only if the decision-making body is able to make the following findings:

a. that the parcel is otherwise undevelopable due to specific policies of the applicable land use plan and development standards of this ordinance, other than for reasons of public health and safety;

b. *that the grant of a coastal development permit would not constitute a grant of special privileges inconsistent with the limitations upon other properties in the vicinity and land use designation in which the subject property is located...;*

d. *that any development being approved is the least environmentally damaging alternative project. In order to make this finding, the development shall be required to minimize development of structures and impervious surfaces to the amount needed to reduce environmental impacts to the greatest extent possible and shall be required to locate the development on the least environmentally sensitive portion of the parcel;*

e. *that any development being approved under these provisions shall be one of the "allowable uses" as listed under the parcel's zoning classification and that it shall be appealable to the California Coastal Commission in all cases.*

In addition to this “takings” exemption that could be applied on legal parcels that contain Monterey pine ESHA, *County Code* Section 20.147.050 identifies five cases where Monterey pine tree removal is exempt from coastal permit requirements (see, also Issue SH-9 Tree Removal in Appendix A):

A.1.a. removal of non-native or planted trees, except where this would result in the exposure of structures in the critical viewshed area; where defined as habitat; where previously protected by coastal permit or forest management plan or scenic/conservation easement..

A.1.b. removal of hazardous trees which pose an immediate danger to life or structures or where a diseased tree is determined by a qualified professional forester to represent a severe and serious infection hazard to the rest of the forest;

A.1.c except for Monterey Cypress in its indigenous range, thinning of small (less than 12" in diameter) or dead trees from densely forested areas, especially as needed to reduce unsafe fuel accumulations adjacent to existing occupied buildings; and...

A.2.a. removal of diseased trees which threaten to spread the disease to nearby forested areas as verified in writing by a qualified professional forester selected from the County's list of consulting foresters, or

A.2.b. removal of trees in accordance with a previously approved Forest Management plan.

(4) Local Coastal Program Implementation

Since certification of the LCP, significant development has been approved by the County resulting in continuing impacts to Monterey pine forest. In particular, significant numbers of individual trees have been removed to allow individual, primarily single family home, projects to proceed. In addition, several residential subdivisions and “in-fill” residential development have resulted in increased fragmentation of forest resources. Two major LCP amendments were approved by the County and the Commission to allow new subdivisions in forested areas. As summarized in the

Table SH-29d, residentially-related developments make up the vast majority of coastal development permits issued by the County in Del Monte Forest.

Table SH-29e. Coastal Development Permits Reported in the Del Monte Forest Planning Area, 1988-2002

Development Type	Permits	Percent of Permits
Single Family Home Addition	212	41%
New Single Family Home	112	22%
Commercial	50	10%
Single Family Home Guesthouse/Caretaker	29	6%
Demo/New Single Family Home	28	5%
Residential Improvements	27	5%
Other	21	4%
Lot Line Adjustment	14	3%
Utility	9	2%
Shoreline Protection	7	1%
Subdivision	3	1%
TOTAL	512	100%

Subdivisions and Major Developments

The County has approved at least three major projects involving substantial tree removal in Del Monte Forest. Under the LCP, before any new areas shown for residential use can be subdivided, the Resource Constraint overlay must be removed, based on a finding of available public services. This was accomplished through LCP amendments for two areas: Macomber Estates, which created 20 residential lots on a 78.54-acre parcel (LCP Amendment #1-93, Part 6) and the Griffin subdivision, which created 11 residential lots on an 18.4-acre parcel (LCP Amendment #1-94).⁷²

The Griffin subdivision involved the removal of 48 Monterey pine trees. A forest management plan was prepared and the permit required following the forest management plan recommendations, which included a 1:1 replacement ratio. Subsequent permits for individual homes allowed at least 64 more trees to be removed.⁷³

⁷² The Coastal Commission and State Board of Forestry were also supposed to concur that these did not result in a conversion of commercial coastal timberland under *Del Monte Forest LUP* policy 39, because they were designated forestry special treatment areas. The Coastal Commission made this finding for the Macomber LCP amendment, but not for the Griffin amendment.

⁷³ The County so far has issued seven coastal permits for homes on the newly subdivided lots. Available information from four of those permits indicates 59 trees were removed; species were not always identified in the material available. (1 permit that indicated

The Macomber subdivision resulted in removal of approximately 139 Monterey pine for road construction. The forest management plan for the subdivision recommended that replacement planting of Monterey pine over 12 inches diameter be replaced with coast live oak for 50% of pines removed, at the discretion of the landowner. The basis for this recommendation was that coast live oak (1) tends to be less of a fire hazard; and (2) is lower growing and therefore will provide a better visual screen over the long term.⁷⁴ The forest management plan for the subdivision estimated that approximately 100 additional pine trees would be removed for subsequent home and driveway construction, which required separate coastal permits. To date, subsequent permits for individual homes have allowed at least 78 pine trees to be removed.⁷⁵ A review of aerial photography of the site today reveals about 80% of the forested site was essentially converted to residential use, or above 68 acres (see Exhibit SH-2).

Only one other major development in the Del Monte Monterey pine forest was approved by the County--a golf driving range. This would have resulted in the loss of approximately 2.2 acres of pine forest and the removal of 275 Monterey pine trees. The County's approval required 2:1 tree replacement on the project site for all trees that would be removed. However, the applicant withdrew this proposal after the County's permit approval was appealed to the Coastal Commission.⁷⁶

Monterey Pine Protection on Individual Parcels

Monterey County has issued over 500 other coastal permits involving 393 separate parcels in Del Monte Forest since LCP certification. This represents projects on over a quarter of the total 1,492 parcels in Del Monte Forest. To evaluate LCP implementation with respect to Monterey pine within the Del Monte Forest planning area, a general sample of 30 permits from 1990 to 2002 from various parts of the planning area was reviewed. In addition, 58 coastal development permits for residential development that were issued within an identified sample area at Cypress Point were reviewed (100% sample for case study area; see below).

General CDP Sample

In terms of the general sample, twenty-three of these permits involved new development on vacant lots, four were for additions to single-family dwellings, two were for demolition and replacement homes, and one was for a water storage tank. These permits resulted in the removal of a total of at

a total of 6 trees to be removed that included 2 diseased and 4 dead; PLN 990379, (3-MCO-99-175); 1 permit that only stated "33" trees (no species breakdown); PLN 990598 (A-3-MCO-00-147); 1 permit that included 20 MPs removed; PLN 990031 (3-MCO-01-380); 1 permit that included 5 MP removed; PLN 980495 (3-MCO-99-067).

⁷⁴ Forest Management Plan for Macomber Estates, Lot 14, Block 127, Pebble Beach, July 16, 1990

⁷⁵ The County so far has issued twenty coastal permits for homes on the newly subdivided lots. Available information from nine of those permits authorized removal of 78 Monterey pine trees. PC 94140 (3-MCO-95-008); PC 94130 (3-MCO-95-007); AP 95101 (3-MCO-95-121); ZA 95055 (3-MCO-95-146); PLN 980089 (3-MCO-99-048); PLN 970540 (3-MCO-98-060); PLN 970554 (3-MCO-98-123); PLN 990183 (3-MCO-99-134); PLN 970262 (3-MCO-98-107); PLN 990218 (3-MCO-00-370); PLN 980184 (3-MCO-98-156); PLN 010378 (3-MCO-02-044).

⁷⁶ County coastal permit 970426 (A-3-MCO-98-085).

least 540 Monterey pine trees, or approximately 18 trees per development. All of the applications reviewed had forest management plans prepared. The coastal permits were conditioned to require the applicant to follow the forest management recommendations.

Review of forest management plans associated with seven of these permits indicates that five of these plans included replacement recommendations of less than the LCP's mandated one-to-one ratio. One plan recommended no replacement based on a finding that the forest was considered too dense for the site.⁷⁷ In two instances, the foresters recommended replacement for only trees 12 inches or greater in diameter, stating that this is all that the County requires.⁷⁸ In addition, one of these permits recommended replacement with two other native species instead of Monterey pine because of the assumptions that new pines could be affected by pitch canker disease and the lack of disease resistant strains.⁷⁹

A typical evaluation of a single-family residence and its impacts contains very little, if any discussion of opportunities to avoid or minimize tree removal through alternative siting and design. With the exception of one case⁸⁰ all permits reviewed indicated that relocation of development to another portion of the parcel would not decrease the removal of trees. The forest management plan for one such permit states that there is no way to move the building footprint in order to save more trees without endangering other trees of equal value.⁸¹ There was no evidence in the permits reviewed, either in findings or conditions, that grading was minimized or that efforts were made to realign driveways or reduce the size of structures to minimize the number of trees removed.

In terms of broader habitat concerns, the LCP requirement for in-depth assessment of forest plant associations, such as identification of any endemic plants that are reliant upon Monterey forest for their survival, was not present in the forest management plans reviewed. Instead, types of plant species that were present on site were merely listed. More general assessment of forest and other habitats occurred only when biological reports were also required. The forest management plans did require eradication and avoidance of introduction of exotic invasive plants. No discussion of adjacent forest resources, fragmentation, or cumulative impacts to forest resources was apparent.

With respect to ESHA identification and mitigation, the County made findings relating to proposed projects and consistency with LCP ESHA policies in six instances out of the 30 permits reviewed. In all the other permits, ESHA is not explicitly mentioned. Instead, most include findings that the project would not have a significant impact on the environment, but no direct reference to ESHA or ESHA policies is included. The six permits that cited ESHA policies had findings indicating that although ESHA was present on the project site, there was no significant impact to ESHA because of

⁷⁷ In most cases, forest management plans were not attached to the sample permits. In addition to the seven forest management plans that were reviewed, 20 permits included findings that described the forest management plan recommendations. Of these 20, six included replacement recommendations of less than 1 to 1 replacement, including several which avoided replacement altogether based on findings that the forest was considered too dense for the site or there was no space for replacement planting.

⁷⁸ County coastal permits PLN000021 and PLN990149 (#3-MCO-01-198 & # 3-MCO-01-351, respectively).

⁷⁹ County coastal permit 000021 (# 3-MCO-01-198).

⁸⁰ County coastal permit PC95084 (# 3-MCO-96-091).

⁸¹ County coastal permit PC07913 (#3-MCO-92-27).

mitigation measures incorporated as a condition of approval. It appears that these were references to ESHAs specifically identified in the *Del Monte Forest Land Use Plan* (e.g., Monterey cypress and riparian corridors), and not to Monterey pine forest. Biological surveys were completed for five of the six permit applications where ESHA policies were mentioned.⁸² The biological report for one application recommends clearing non-natives and timing landscaping to avoid infestation of non-natives. Another application states that all characteristic native riparian vegetation on the parcel had been removed beginning 60 years ago and only a few elements of natural community remain. These permits were conditioned to incorporate the recommendations set forth in the biological surveys. In one of the six permit applications,⁸³ a riparian ESHA was identified adjacent to the project site. The biological report determined that the site was not within this ESHA and a finding was made that the project conformed to the policies and regulations for projects adjacent to ESHAs, specifically that the project complied with Policy 8 of the *LUP*. It is inferred through such findings that either ESHA is not present and/or that the project would not have an impact on it.

Finally, with respect to scenic resources all but seven permits reviewed in the general sample contained findings that evaluated the proposed project with regards to scenic and visual policies of the LCP. In four instances, mitigation was required in order to avoid impacts to the public viewshed due to removal of trees; the remaining findings indicated no adverse impacts to visual resources because the proposed developments were not in the public viewshed and/or were not ridgeline developments. In some cases, projects were within the public viewshed, but were partially screened by existing walls, structures, or trees. In one of the two permits that required mitigation, the location of the development was moved further away from Highway 68 in order to reduce visual impacts.⁸⁴ All forest management plans included an assessment of the proposed development on scenic resources from a site-specific perspective and where applicable, made recommendations for mitigating impacts.

Cypress Point Case Study

The Cypress Point area of Del Monte Forest was substantially forested before the Coastal Act was adopted. The area includes both Monterey pine, and the endemic Monterey Cypress ESHA that is specifically identified in the LCP. As shown in Exhibit SH-3, though, the intact Monterey pine forest of the Cypress Point area has been gradually diminished over time, through continuing residential development. The time series shows that significant development has occurred in the forest both before LCP certification, and after certification. Since 1988, the County has approved at least 58 coastal development permits for new development within the sample case study area. As with the general sample for Del Monte Forest, the vast majority of this development activity was

⁸² County coastal permits PC07481 (# 3-MCO-90-138), PC07674 (3-MCO-91-053), PC07660 (3-MCO-91-088), PC07634 (3-MCO-92-026), and PC94094 (3-MCO-95-10).

⁸³ County coastal permit PC94094 (#3-MCO-95-10).

⁸⁴ County coastal permit PC95084 (# 3-MCO-96-091).

associated with residential land uses, including 18 new single-family homes and 24 residential additions.⁸⁵

Table SH-29f. Coastal Permits in Cypress Point Area

Development Type	Number	Percent
Single Family Home Addition	24	41%
New Single Family Home	18	31%
Residential Improvements	5	9%
Guesthouse	3	5%
Demo/New Single Family Home	3	5%
Caretaker's unit	3	5%
LLA	1	2%
Commercial other	1	2%
TOTAL	58	100%

The approval of this residential development is generally consistent with the land use designation (residential) and zoning. Also, similar to the general sample, most of the permits that were approved within forested areas had the required forest management plans completed. Nonetheless, at least 539 trees have been approved for removal in this area since 1988, an average of 9 trees per coastal development approved. New single-family homes generally resulted in more tree removal, with an average of 22 trees removed per application. In addition, as the aerial photos document, the forest has become substantially degraded as new residential development was approved, through the loss of habitat area and significant fragmentation of the forest canopy. It is interesting to note, though, that the area of Cypress Point along the shoreline that has been more formally recognized in the LCP as ESHA because of the presence of endemic Monterey Cypress habitat appears to have been

⁸⁵ Permits reviewed include: PC06378 (3-MCO-88-012), PC06549 (3-MCO-89-035), PC06542 (3-MCO-89-052), PC06456 (3-MCO-89-059), PC06613 (3-MCO-89-071), PC06612 (3-MCO-89-093), PC06840 (3-MCO-89-101), PC06821 (3-MCO-89-134), PC07076 (3-MCO-89-185), ZA07177 (3-MCO-90-078), PC07511 (3-MCO-90-148), PC07215 (3-MCO-90-188), PC07509 (3-MCO-90-192), PC07535 (3-MCO-90-200), PC07593 (3-MCO-90-209), PC07295 (3-MCO-90-213), PC07637 (3-MCO-91-049), PC05597 (3-MCO-91-077), PC07660 (3-MCO-91-088), PC07803 (3-MCO-91-109), PC07877 (3-MCO-92-010), PC07634 (3-MCO-92-026), PC07892 (3-MCO-92-039), PC92143 (3-MCO-92-118), PC93032 (3-MCO-93-065), PC93058 (3-MCO-93-092), PC93122 (3-MCO-93-112), PC93157 (3-MCO-94-013), PC94093 (3-MCO-94-079), PC94087 (3-MCO-94-089), PC95056 (3-MCO-95-087), ZA95040 (3-MCO-95-092), PC94198 (3-MCO-96-002), ZA96002 (3-MCO-96-030), 965049 (3-MCO-96-143), 965351 (3-MCO-97-010), 965334 (3-MCO-97-050), PLN970092 (3-MCO-97-069), ZA96021 (3-MCO-98-048), PLN980017 (3-MCO-98-136), PLN980498 (3-MCO-98-194), PLN980514 (3-MCO-99-101), PLN990265 (3-MCO-99-139), PLN990244 (3-MCO-99-157), PLN990297 (3-MCO-99-167), PLN990331 (3-MCO-00-211), PLN990597 (3-MCO-00-283), PLN000010 (3-MCO-00-432), PLN990600 (3-MCO-00-571), PLN980336 (3-MCO-00-592), PLN000025 (3-MCO-00-616), PLN000408 (3-MCO-00-617), PLN000021 (3-MCO-01-198), PLN000699 (3-MCO-01-246), PLN010225 (3-MCO-02-054), PLN000380 (3-MCO-02-217), PLN000251 (3-MCO-02-243), PLN010473 (3-MCO-02-357).

protected reasonably well, at least based on a superficial aerial photo analysis of the forest canopy relative to areas of adjacent Monterey pine forest.

Implementation issues raised by the Cypress Point study area are numerous. First, with few exceptions the Monterey pine forest of this area has not been identified as ESHA in permitting actions, and in few cases were the LCP ESHA policies specifically applied. Some actions, though, did recognize the Monterey pine forest as “habitat” and recommend either changes to the project or mitigation for impacts to habitat separate from strict application of the LCP ESHA policies. For example, in 3-MCO-90-209, the County concludes the project site is “environmentally sensitive because of the dense vegetation of Monterey Pine, coast live oaks and coastal shrubs.” The LCP ESHA policies, though, are not directly applied, and development was approved with a FMP. In 3-MCO-91-049, the County approved an addition to an existing single family home but denied the application for a caretaker’s quarter because of impacts to both Monterey Cypress habitat, identified in the Findings as ESHA, and Monterey pine. The findings specifically acknowledge potential impacts to a “remarkably dense, apparently naturally occurring, miniature forest of Monterey pine seedlings,” and apply the LCP forest protection requirements to deny the development because there were “feasible and suitable locations on the parcel” that would avoid impacts to Monterey pine habitat and Monterey Cypress ESHA.

Other projects provide evidence of considering alternatives and attempting to minimize impacts, although in general significant amounts of development in forested areas are still approved. In one case, 3-MCO-90-213, the planning staff recommended denial of an addition to a single family home because alternative sites were available to minimize cutting of trees; the Planning Commission, though, approved the project. In 3-MCO-90-200, the record shows that the site had healthy pine forest cover, but the FMP does not discuss alternatives to avoid or minimize impacts, and the driveway design is not simple and direct, which is a common design issue in DMF. In 3-MCO-00-616, the findings reject an alternative that would reduce tree removal in part because the alternative would encroach into a yard setback. Finally, in 3-MCO-92-002, the County approved a new home, and the removal of 92 trees, on parcel size greater than 2 acres. The project was designed with significant coverage, well set back off the street and thus with a long driveway, a caretakers unit, a vehicle turnaround, and substantial landscaping.

In some cases, the County has acted to reduce impacts to forest habitat. In 3-MCO-89-101, the County approved a 5,885 square foot house with garage and gazebo, with significant tree removal. The project also included after the fact review of 6,000 square feet or more of disturbance to the forest habitat through construction of a putting green and landscaping. Ultimately, the Planning Commission did not approve the excess disturbance and required restoration of the area. Notably, the Findings refer to the project being in “Monterey pine forest habitat” and the staff report refers to the inconsistency of the putting green and garden with the LCP’s ESHA policies. Similarly, in 3-MCO-90-188, the County approved ATF improvements to the project site grounds, but did not allow a tennis court and again required restoration of the pine habitat. Finally, in 3-MCO-90-078 the County denied an ATF consideration of tennis court grading that had resulted in the removing of at least 65 Monterey pine. These decisions show that in certain egregious cases, the County has taken

action to both protect (through project redesign or even denial) and restore Monterey pine forest habitat. They also illustrate that there may be significantly more tree removal occurring than is represented in the reported final location actions. As mentioned, the LCP does not require a coastal development permit for the removal of trees in certain circumstances, such as identification of safety hazards, or thinning of trees less than 12 inches in diameter.

Beyond the problem of ESHA identification and alternatives analysis, County actions illustrate how the certified LCP policies promote a “tree-centric” approach as opposed to a habitat protection approach in dealing with Monterey pine forest. For example, in 3-MCO-90-148, the County approved a new 4,907 square foot home, with 2,024 square feet of terraces, an 850 square foot three-car garage, 210-foot long driveway, and visitor parking. The forest management plan accompanying the approval describes removal of 24 pine trees ranging from 10 to 23 inches in diameter, but also refers to loss of 48 excessively dense Monterey pine seedlings from the construction area. Although the FMP recommended that seedlings be redistributed to locations where light and space were appropriate, there was no specific consideration of the habitat impacts of the project per se, which were illustrated by the direct construction impact to an area of regenerating forest. The decision making focus remained on removal of “significant trees.”

Even in cases where there was strong evidence of valuable habitat areas, large developments have been approved, with considerable disturbance envelopes. In 3-MCO-91-088, the County approved a new home and guesthouse, 5-car garage, 1,000 square foot pool, 1,300 square feet of decks, 3,362 square foot courtyard, (for a total of 11,960 square feet of impervious surfaces), along with the removal of 47 trees. The biological assessment and FMP identified the site as containing good habitat, and actually analyzed the project as development adjacent to environmentally sensitive habitat areas. The applicant also committed to protecting the native habitat remaining around the disturbance envelope. In addition, while this is a good example of a FMP recommending that pine trees from Del Monte Forest stock be used in mitigation plantings to preserve the genetic integrity of the forest, the more obvious illustration of the project is the project’s significant disturbance envelope on this 2.41-acre site. The administrative record also contains a letter from the California Department of Fish and Game expressing concern about significant impacts to Monterey pine and oak forest habitat.

It is clear that under current LCP rules, the proposed development design, and impacts to specific trees, are the driving decision factors, rather than impacts to habitat. Thus, in 3-MCO-00-616, the County approved a large expansion of an existing home into forest habitat area (4,919 square feet and 760 square feet of garage added to an existing 3,381 square foot home). The FMP acknowledges the fair condition of the forest, but also notes strong forest regeneration in areas, and the importance of retaining the native soils on the site. Nonetheless, the addition to the existing development is allowed, and further, “hazardous” trees due to potential wind throw and impact to the development are proposed for removal. In short, the new development envelope determined the impacts to the habitat resource, rather than the habitat serving as a constraint to project design.

Another problem with the current LCP implementation is the lack of appropriate mitigation for habitat impacts. For example, in 3-MCO-01-198, a new single family home with 7,525 square feet of coverage (13.2%) was approved on a 1.3 acre forested lot. While the FMP described the forest as in fair to poor health, the biological report concluded that the native ecosystem was in “good health”. There is no recognition of the forest as ESHA in the Findings, although scenic value is acknowledged. In addition, no tree replacement was required because it was concluded that no disease resistant stock (from pitch canker) was available. The FMP thus concludes that the only mitigation available is preserve remaining habitat:

...the best solution to combat pitch canker is to preserve the habitat and encourage regeneration of Monterey pine with the hope of natural resistance in the future.

In contrast to these instances where large areas of Monterey pine habitat have been impacted, other cases show that where ESHA is specifically identified in the LCP, County implementation of measures to protect habitat has been more effective. Thus, projects 3-MCO-96-030 and 3-MCO-93-065 are good examples where ESHA designation (Monterey Cypress) findings were made, and the resource was protected, by first approval of a demolition and rebuild in the same footprint as the existing house, without new habitat impacts; and subsequent approval of landscaping features, but only after they were redesigned to comply with the drip line requirement and avoidance policies of the LCP Monterey Cypress ESHA policies. Similarly, in 3-MCO-89-93, the County approved a single family home but the project was designed to avoid and protect cypress ESHA

Finally, another implementation problem is the incremental loss of habitat over time, even when prior approvals might have restricted future impacts pursuant to an FMP. For example, the permits 3-MCO-94-79 and 3-MCO-99-139 show how an existing home in the forest gradually expands in multiple permits. The County approved an addition and caretaker’s quarters to the existing home in 1994, and required a FMP, but later followed this with an approval of another addition, incrementally removing habitat area that previously had been found to be in good condition by the FMP. Similarly, in 3-MCO-89-185 and 3-MCO-97-050, a new single family home was approved with a FMP, followed by an approval of a stable and guest house 10 years later, which had the result of further fragmenting and impacting Monterey pine habitat on the site. Had an appropriate long-term habitat restriction been placed on the project site in the first permitting action, subsequent habitat impacts may have been avoided.

More generally, there is no evidence in the permitting record that FMPs, biological reports, or the County’s planning process is considering the *cumulative* impacts of development in the Monterey pine forest, or the relationship of project sites to surrounding forest habitats. Aerial photos illustrate the significant cumulative change that has occurred in the Cypress Point area. In terms of tree removal, the coastal permit sample herein suggests that thousands of trees have been removed since LCP certification.⁸⁶ Although not quantified in this analysis, cumulative habitat impacts are no

⁸⁶ For example, if the number of trees removed per permit in the general and Cypress samples are extrapolated, somewhere between 4,500 and 9,000 trees may have been removed. In the Cypress case study, development of new single-family homes led to the

doubt substantial as well, not only in terms of direct loss of habitat area, but in terms of fragmentation of habitat.⁸⁷ Such cumulative impact analysis has not been occurring through the process of individual FMP preparation and coastal development permitting

(5) Analysis of Coastal Act Conformance

Implementation of the Monterey County LCP with respect to protection of Monterey pine forest habitat must be evaluated within the context of the significant changes, both in the environment and in our understanding of the species and its habitat, that have occurred since LCP certification in 1988. And while the certified LCP arguably contains adequate policy tools to protect Monterey pine forest ESHA *when it is identified*, the County's LCP implementation history makes clear that changes to the LCP and implementation are needed if maximum protection of Monterey pine forest habitat is to be assured consistent with the Coastal Act. More fundamentally, even though the County has followed the general requirements of the LCP, such as the requirement to have Forest Management Plans for projects in the Monterey pine, the current approach of the LCP is outdated inasmuch as it focuses on tree removal and replacement, rather than on pine forest habitat protection.

Indeed, it has become clear that on-going loss of Monterey pine forest since LCP certification is not consistent with the Coastal Act requirement to protect environmentally sensitive habitat areas. Although some of this loss can be attributed to natural causes, especially pine pitch canker, County coastal permits have authorized the removal of significant numbers of trees and habitat areas. Fragmentation of the forest has continued. The cumulative impact of this development on the forest has been significant. In addition, major intact areas of Monterey pine forest remain zoned for increased residential development, or are proposed for other intensive development. Thus, current LCP policy and implementation, and the policies that would guide future development, are not consistent with or adequate to carry out Coastal Act Sections 30107.5 and 30240. Changes are needed to strengthen the identification and protection of Monterey pine forest habitat areas, in addition to the continuing protection and minimization of individual tree loss.

Identification of Monterey Pine Forest ESHA

Identification of Monterey pine forest ESHA is the first and most important step in the protection of this sensitive habitat. As discussed previously, the certified LCP does identify the habitat values of the Monterey pine forest, and even maps certain occurrences, although it is less specific about its status as ESHA in particular circumstances. There is no specific LCP guidance about delineation of Monterey pine forest ESHA other than the identification of its association with the Bishop pine and Gowen Cypress, and perhaps its occurrence on coastal dunes. As shown, the County has approved non-resource dependent development, such as new residential subdivisions and houses, in Monterey pine forest. Although these permits followed land use plan designations and densities and applied

removal of 22 trees on average. Extrapolated over the entire DMF, this means potentially some 2,500 trees were removed for new home development alone (given 112 new single family homes developed since certification).

⁸⁷ For example, assuming an average disturbance envelope between 5,000 and 10,000 square feet, the approval of 112 new single-family homes may have resulted in the cumulative direct loss of between 13 and 26 acres of habitat. The biological impacts or effective loss of habitat though would be much greater, given the fragmentation of habitat and associated impacts.

specific pine protective policies, they did not always follow the LCP's ESHA policies with respect to Monterey pine forest areas that arguably should have been treated as ESHA. It should be acknowledged, of course, that significant new knowledge and other environmental changes have occurred since LCP certification, and thus the lack of Monterey pine ESHA protection in prior years, both by the County and the Commission, is partly a function of an outdated LCP and policy framework for Monterey pine. Still, while the Forest Management Plan methodology has been followed reasonably well by the County, it is clear that this approach does not prevent significant disturbance and fragmentation of what we now understand more clearly than ever to be environmentally sensitive habitat.

Most fundamentally, based on current understandings of the Monterey pine species, it is clear that there must be a general presumption that pine forest habitat areas within the historic range of the forest on the Monterey peninsula are environmentally sensitive habitat areas. Indeed, since certification of the LCP, Monterey pine has been listed by the California Native Plant Society as a "1b species," and many new species associated with Monterey pine have also been identified as sensitive. New studies have been completed identifying the special and limited status of Monterey pine forest in the coastal zone, including new information about the ecological staircase of the Del Monte Forest. Other studies of the genetic diversity of Monterey pine have been completed, and new organizational efforts focused on the protection of pine forest habitat have formed. With the threat of pine pitch canker, and on-going development impacts to remaining forest habitats, the sensitivity of Monterey pine forest as a limited and unique habitat has become much more apparent. The forest should be considered for listing as "threatened" or "endangered" by the State and federal governments (see Recommendation SH-29.10).

Acknowledging this general presumption is consistent with and a logical extension of prior Coastal Commission actions concerning Monterey pine. Thus, the Commission has long recognized that Monterey pine forest ESHA occurs in all three coastal locations (Año Nuevo, Monterey Peninsula, Cambria). This includes the general acknowledgment in the *Del Monte Forest LUP* policies, cited previously, as well as the more specific acknowledgment in policies of the *Carmel Area LUP* that Monterey pine forest areas that include "naturally occurring groves" that function as habitat for rare or endemic plant or animal species or that have "special value for wildlife due to the presence of snags suitable for cavity-dwelling species, or occurrence with Coast live oak, or native shrub understory," are sensitive habitat. Similarly, the certified Santa Cruz County LCP specifically identifies the Año Nuevo Monterey pine population as ESHA, and in San Luis Obispo County, the certified LCP identifies and maps the Monterey pine forest in the Cambria area as sensitive terrestrial habitat ESHA.

The Commission also has rigorously applied ESHA policies in each of these jurisdictions pursuant to the LCPs. For example, in multiple appeals of coastal development permits in the Cambria area, the Commission has protected Monterey pine ESHA by denying a lot-line adjustment that would have created new development potential in pine forest ESHA; and by limiting single-family home development to the maximum extent feasible, while still allowing a reasonable economic use of the

property in question.⁸⁸ In cases of large-lot residential development in the Cambria pine forest, remaining habitat areas were required to be put into conservation easements. In another important San Luis Obispo LCP planning decision, the Commission again acknowledged the Monterey pine forest ESHA on the Hearst Ranch and North of Cambria, and adopted LCP modifications to the *North Coast Area Plan* that would prohibit or limit new development within this ESHA.⁸⁹

In Santa Cruz County, the Commission limited a large residential project in part based on the identification and protection of Monterey pine habitat.⁹⁰ In Del Monte Forest, as mentioned, the Commission has previously allowed a significant subdivision in Monterey pine forest. However, more recently and in response to changed circumstances, the Commission staff has analyzed the impacts of a golf driving range project on Monterey pine and concluded that a substantial issue was raised by the project's impacts on Monterey pine forest. This appeal was not acted on by the Commission, though, as the project appellant withdrew the action.⁹¹

Most recently, the Commission adopted the Land Use Plan for the City of Carmel-by-the-Sea, which included the designation of Monterey pine ESHA in Pescadero Canyon, adjacent to the Del Monte Forest planning area.⁹² The Commission recognized that Monterey pine forest in this area was ESHA, and that Monterey pine was a special status sensitive species (CNPS 1B). The Commission's findings also acknowledge that the ESHA conclusions were based on a comprehensive biological assessment reviewed by the Commission's biologist. This assessment included an evaluation of the subtypes of Monterey pine on different geomorphic surfaces in the Canyon (in this case Middle-aged dunes and Shale bedrock) as developed by the Jones and Stokes work in the mid 1990s, and underscored the sensitivity of the middle-aged dunes subtype of Monterey pine forest habitat.

But the general acknowledgment afforded Monterey pine forest as ESHA by the Commission in its planning and regulatory decisions has not been universally applied in Monterey County, and it is apparent that existing Monterey pine forest areas that might have qualified as ESHA if analyzed "on-the-ground" have been neglected. Part of the problem may be due to differences in interpretation of the LCP definition of ESHA. In one view, Appendix A of the LCP, which lists examples of ESHA, is considered as the "complete and final" universe of ESHA. Thus, unless the LCP is amended, only those species and habitats specifically identified in the LCP at the time of certification would be considered ESHA in regulatory decisions. This interpretation of the LCP would not allow for the fact that the environment is dynamic, and that the occurrence and sensitivity of habitats may change over time, depending on any number of circumstances. Under this interpretation, Monterey pine forest would not generally be considered ESHA, despite all of the

⁸⁸ See Coastal Commission appeals A-3-SLO-03-117, A-3-SLO-03-045, A-3-SLO-02-074, A-3-SLO-00-078, A-3-SLO-00-079, A-3-SLO-00-118, and A-3-SLO-01-122.

⁸⁹ Coastal Commission Revised Findings, North Coast Area Plan Comprehensive Update, San Luis Obispo County Local Coastal Program Major Amendment Number 1-97, January 1998.

⁹⁰ Coastal Commission appeal A-3-SCO-00-033.

⁹¹ County coastal permit 970426 (See Staff Report for Coastal Commission appeal A-3-MCO-98-085).

⁹² Adopted March 6, 2003.

changed circumstances since LCP certification, except in those limited circumstances already identified in Appendix A (associations with Bishop Pine and on dunes).

The Commission's position with respect to this LCP interpretation has been that the more general definition of ESHA in the certified LCP, which closely tracks Coastal Act Section 30107.5, is controlling in regulatory decisions, based on the evidence available at the time of decision. Thus, the word "complete" in the sentence, "A complete listing is included as Appendix A of this Plan," qualifies the list of *examples* of ESHA recognized at the time the LCP was written. The LCP, therefore, should be interpreted as leaving open the potential for other habitats not in this list of examples, which is a much more credible interpretation of the LCP when read as a whole. This interpretation also is consistent with the Commission's strong policy that ESHA is determined by the current state and status of habitat resources "on-the-ground" when project impacts are being reviewed. A good recent example of this policy is the certified Malibu LCP, which includes specific policies to assure that the definition of ESHA is not static.

This point is important because were the LCP and Appendix A to be interpreted as some, including the County at times, have suggested, numerous sensitive species and their habitats in Monterey County that clearly meet the Coastal Act and general LCP definition of ESHA today, but that were not necessarily known or acknowledged to be threatened at the time of LCP certification, would not be protected as required by Coastal Act Section 30240. This might include, for example, not only Monterey pine forest habitat, but also such sensitive species as Yadon's piperia and the California red-legged frog, both of which were identified as having a heightened sensitivity since LCP certification. Neither are specifically listed or mapped in the LCP.

In order to be consistent with the Coastal Act ESHA protection requirements of Sections 30107.5 and 30240, therefore, Issue SH-1: ESHA Identification includes recommendations to the County for updating and standardizing ESHA definitions and maps to remove any ambiguity as to whether Monterey pine forest (along with other environmentally sensitive habitat areas not specifically listed in Appendix A of the LCP or not mapped or fully mapped) is ESHA (see Periodic Review Appendix A, p. 21). Clarifying the definition of ESHA in the LCP and assuring that actual "on-the-ground" resource circumstances are determinant in resource management decisions is important to the future protection of Monterey pine forest (and other) ESHA. And this clarification will likely lead to more effective use of the certified ESHA policies in the *Del Monte Forest LUP* by the County to protect Monterey pine forest habitat. As the evidence shows, when ESHA is specifically identified in the LCP, such as the endemic Monterey Cypress habitat, implementation is more effective.

But beyond this common sense update to the LCP, the more complex ESHA identification question that needs to be addressed in an amended LCP are the specific process and biological factors to be used in delineating Monterey pine forest habitat in individual cases and circumstances. As the Periodic Review has shown, other than the specific association with Bishop Pine and Gowen Cypress, Monterey pine forest has rarely been identified as ESHA by the County or biological consultants preparing forest management plans under the current LCP process. There is a need, therefore, to amend the LCP with stronger and updated biological guidance to assist planners,

consultants, and decision makers in delineating Monterey pine forest ESHA (see Recommendation SH-28.4A).

Current science regarding Monterey pine forest illustrates the significance of the unique soils, moderate coastal climate, and influence of summer fog in determining the historic and contemporary range and extent of pine forest occurrence. As a starting point, within this historic range, there should be a general presumption that Monterey pine forest is present. But this does not necessarily mean that all areas within the general area are ESHA for purposes of the Coastal Act. Large areas of the historic range of forest are now developed to varying degrees, ranging from extremely urban, such as the commercial core of Carmel, to the more rural, large-lot residentially developed areas in Del Monte Forest. Within these areas, existing Monterey pine may or may not exist in large numbers, the canopy may be more or less connected, the understory is in varying degrees of degradation, and trees may not even be “native” (a certain amount of “planted” Monterey pine that may not be from the peninsula genetic stock is known to exist), and so on. On the other hand, notwithstanding the on-going development trends in the forest, significant stands of indigenous intact pine forest, with healthy native understories, remain undeveloped. In addition, even relatively “developed” areas of the Monterey pine forest may be contributing in a significant way to the forest ecosystem and the long-term sustainability of the habitat by providing such things as areas for regeneration of genetic diversity, wildlife habitat, or genetic diversity in existing trees.

Given the current state of the forest, the most fundamental LCP update needed to guide the identification of pine forest ESHA is to move away from the strong focus on individual tree protection and replacement to a comprehensive set of policies that emphasize protection of Monterey pine forest habitat. In general, considerable scientific knowledge about the functioning of ecological systems and the complex relationships in plant communities or habitat types, including forest ecology, has been developed since certification of the LCP. There is a more developed and general appreciation for the importance of maintaining larger, contiguous habitat areas. The field of conservation biology has provided insights about the significance of habitat connectivity, wildlife corridors, and the detrimental impacts of “edge effects”.⁹³

In the specific case of Monterey pine forest on the Monterey peninsula, the *Del Monte Forest Land Use Plan* does have policies that generally call for maximum protection of the forest resource, and that require the minimization of tree removal through design changes and clustering of development. There are even polices that call out the importance of plant community associations and the soils that make up the pine forest habitat. But the policies also allow for the removal of trees under the guidance of forest management plans. As the Periodic Review has shown, development approved under the LCP has continued to impact the forest, and has contributed to its continuing degradation, because specific attention has not been paid to these more “ecological” concerns for the forest habitat resources. As discussed previously, since certification of the LCP, the scientific literature on Monterey pine has developed considerable information about the ecology of the forest generally, the

⁹³ See generally, California Coastal Commission, *City of Malibu Local Coastal Program Adopted Findings*, September, 2002, pp. 41-43.

specific ecology of pine forest subtypes on the ecological staircase, the importance of maintaining genetic diversity within the population, etc. Much of this information further underscores the need to treat Monterey pine as a habitat system and, in particular, the need to maximize protection of habitat areas, not simply trees.

Factors in Identifying Monterey Pine Forest ESHA

Although the scientific literature on Monterey pine forest continues to evolve, significant knowledge has been developed that supports a strong precautionary approach when considering the protection of Monterey pine. In particular, it is clear that the various stresses to the pine forest, including pine pitch canker, loss of habitat area to development, fragmentation of habitat and increased edge effects, genetic contamination, and the lack of fire as an ecological regulatory mechanism, are combining in such a way as to make remaining large intact undeveloped forest areas increasingly important for the preservation of Monterey pine forest habitat. Coupled with the uncertainty of climate change, and the relative lack of knowledge about the genetics of Monterey pine, it is difficult to fully understand the status of the Monterey pine forest health, and whether it is effectively adapting to the environmental changes within and around it. It is for this reason that recent conservation studies have recommended the preservation of larger, intact areas of Monterey pine forest. For example, in its petition to the Department of Fish and Game to list Monterey pine as a threatened species, the CNPS recommended that large tracts of representative forest areas be protected.⁹⁴ More recently, research by Deborah Rogers recommends the designation of genetic reserves within each of the five native Monterey pine populations. The research is clear that the larger the reserve, the more likely that natural processes such as growth and reproduction, and genetic adaptation to local environmental circumstances, will function to support the sustainability of the population. The research confirms that it is important to avoid significant losses of intact forest, to limit fragmentation, and even to provide habitat areas in which pine forest can regenerate naturally, particularly on the edges of remaining forest areas.⁹⁵

Larger areas of intact pine forest also tend to be those places where other sensitive species and more healthy assemblages of pine forest plant communities are found. In addition, larger areas of undeveloped forest provide opportunities to protect the even more unique ecological values of the sub-types of forest habitat found on the ecological staircase. In short, based on the ecological and biological surveys to date, it is clear that many of the remaining large areas of forest in the Del Monte Forest Planning area should be treated as ESHA, not only due to the presence of intact Monterey pine forest, but also due to the presence of other species and in some cases riparian and wetland resources (see Recommendation SH-29.2). This includes Del Monte Forest Planning Areas B, C, F, G, H, I, J, K, L, O, P, Q, R, S, U, V and Y, which have been reviewed previously in some

⁹⁴ California Native Plant Society, "A Petition to the State of California Fish and Game Commission," August 1999, p. 19.

⁹⁵ Rogers, *Id.* p. 46.

detail in relation to development proposals by the Pebble Beach Company and Measure A.⁹⁶ It may also include other large parcels not yet evaluated in detail.

As discussed further below, other factors than the size of remaining forest areas should be considered in making ESHA determinations. It is unlikely, though, that any parts of the remaining large intact areas of Monterey pine forest would not qualify as ESHA after more site specific evaluation. Significant intact stands of Monterey pine remain in the Carmel and Del Monte Forest areas, and at the northern extremity of the Big Sur Coast area. All of these stands need to be consistently designated and protected as ESHA. Thus, one of the most important first steps in protecting Monterey pine forest ESHA under Section 30240 is to update the LCP land use designations to provide maximum protection of these remaining indigenous forest areas. Recommendation SH-29.2 achieves this protection of ESHA for areas that have previously been evaluated, and directs the County to also protect other vacant areas not yet evaluated in any detail that may consist of Monterey pine ESHA.

Other factors that should be considered when identifying Monterey pine forest ESHA include degree of forest fragmentation or inversely, connectivity to other habitat areas. Thus, a very small area of Monterey pine completely disconnected from other significant pine forest areas may no longer function in such a way as to be considered ESHA, particularly if it is also lacking in health in other ways. For example, it may have few if any native species in its understory, or it may be substantially landscaped with non-native species. It may also be contaminated with or consist of pine stock that is not endemic to the area, or the stand of trees may be in declining health due to pitch canker or other disease, or it may show very little evidence of regeneration or potential for regeneration. The soils in the area may be so disturbed as to no longer provide native regeneration capability.

But small areas of Monterey pine may be ESHA if the health of the stand is good, particularly if there is healthy understory, or if there is a strong assemblage of other native and sensitive plants associated with it. The location of the stand may be important as well. As shown previously, the ecological staircase on the Monterey peninsula defines stands of pine on various geomorphic surfaces, with unique assemblages of vegetation. Monterey pine on Terrace 6, for example, is extremely limited. Thus, remaining pine forest on this surface should be treated as particularly special and unique. Similarly, the genetic diversity of a stand may be particularly valuable to the population as a whole. A smaller area, while not necessarily part of larger forest area, may still provide a corridor benefit, or fill an important role in the upper story canopy. The integrity of the canopy is also a factor to consider in evaluating pine forest, particularly when the function of certain wildlife such as the grey squirrel in the ecological cycle of pine forest is considered.

As discussed in this review, some research and field study has been undertaken to attempt to characterize remaining pine forest based on various factors. In outlining a conservation strategy, the

⁹⁶ See Commission staff comment letters to Monterey County at Coastal Commission website <http://www.coastal.ca.gov/> for more detail on biological characterization and evaluation of these areas.

Huffman and Associates report used extent of existing protection, genetic contamination, invasive plants, stand health, stand configuration (e.g. fragmentation), associated species, suitability for fire, and natural regeneration as measures of certain remaining forest stands.⁹⁷ The Jones and Stokes work is premised, at least implicitly, on distinctions between urban and non-urban areas, which is a measure of understory health (plants, soils, etc.), as well as percent cover of the canopy, using 20% as a distinguishing line between more and less fragmented or degraded forest areas.

Overall, the County LCP needs to be updated to provide guidance on the identification of Monterey pine forest ESHA. Although all occurrences of Monterey pine forest may not be ESHA, decision makers should begin with a presumption that areas within the historic range of Monterey pine are ESHA, unless site-specific biological evaluation shows otherwise. The overarching consideration should be whether an area meets the Coastal Act Section 30107.5 definition of ESHA, which is reflected in the general definition of ESHA in the LCP already, based on the presence of pine trees and/or suitable habitat (e.g. soils, climate, summer fog). Each of the relevant biological and ecological factors should be assessed in order to determine whether a particular area is not ESHA. Recommendation SH-29.3 recommends preparation of a guidance document for identification of Monterey pine forest ESHA.

Avoiding Monterey Pine ESHA

Various recommendations flow from the updates that would more clearly identify Monterey pine forest as ESHA. First and foremost, the Coastal Act requires that only non-resource dependent development be allowed in ESHA. Strengthened LCP policies are needed to clearly prohibit all non-resource dependent development within identified Monterey pine forest ESHA. For those cases where existing vacant legal lots of record are zoned for residential or other private use, the LCP provisions that allow for a minimal reasonable economic use should be applied. Related to this, the County should reevaluate the current zoning standards in Del Monte Forest and consider reductions in total site disturbance allowed that would achieve the goal of providing an economic use while maximizing protection of pine forest ESHA. For example, in other areas of the Coastal zone, the Commission has adopted standards that would allow for a maximum of 20% site disturbance (Pacific Grove), 25% in the City of Malibu, and as high as 50% on very small lots in the Del Monte Dunes area of the City of Monterey. For existing developed lots, the LCP should be amended to make clear that no new development is allowed in identified ESHA, and that development that is non-conforming with revised ESHA protection standards be required to come into conformance when redevelopment goes beyond a specified threshold.

To the extent that the County's approvals allowed for some minimal development of existing legal lots, the Coastal Act provisions to prevent unconstitutional takings would be partially satisfied and would override the ESHA prescriptions. However, LCP policies have been applied in a manner that would allow greater forest destruction than would be contemplated under strict application of the Coastal Act and by extension Section 20.02.060.B of the *County Code*, as will be discussed further below. As noted in Issue SH-6: Mitigation for Habitat Loss, the County does not currently have an

⁹⁷ Huffman, *Id.*

off-site mitigation program to address inevitable habitat loss on single-family lots, and hence, there have been no compensatory mitigation measures required for loss of Monterey pine forest. This concern is addressed in Issue SH-6 recommendations for a minimum three-to-one replacement of disturbed sensitive habitat acreage due to permitted development (see pages 36 –38 of Appendix A). This report has documented that new information indicates that different pine forest subtypes (based on geomorphic surface location) are each individually significant. Any compensatory mitigation must account for the specific subtype loss.

The Periodic Review also illustrates that improvements could probably be made in the siting and design of new developments that must be approved in pine forest habitat. The LCP calls for new residential development, including driveways and parking areas, to be designed and sited to minimize the cutting of trees. From review of information in the permit sampling, it appears the County has not fully considered or implemented this policy. While there is often less tree removal allowed than requested, large homes and long driveways are still accommodated where additional modifications could result in less tree (and habitat) removal. This emphasis on avoiding tree removal without considering additional measures such as redesign and provision of buffers also means that the forest as a whole, including its understory and open space meadows, is lacking the comprehensive protection that the Coastal Act requires. Thus, current practice does not show much attention to locating development in areas to minimize fragmentation and thus maximize protection of remaining habitat. Revised FMP standards may be needed to clarify this site design goal. In addition, more specific concern for the cumulative impacts of individual projects, or the relationship of projects to the surrounding forest habitat, needs to be built into the FMP process.

Mitigation of Monterey Pine ESHA Impacts

The LCP's focus on protecting trees with a diameter over 12 inches (through the requirement of a preparing a forest management plan and defining them as "significant") overlooks the important role that younger smaller trees play in the ongoing health and evolution of the forest ecosystem. Since certification of the LCP, additional scientific research has identified the importance of protecting all native trees regardless of size to effectively protect this unique and sensitive habitat type in a manner that the Coastal Act requires. Thus, the LCP's allowance of small diameter pine tree removal without even the necessity of obtaining a coastal permit or preparing a forest management plan adversely impacts the ESHA. Recommendation SH-29.1 addresses this deficiency.

A related and critically important concern is the LCP's current encouragement of thinning the forest. Thinning substitutes human judgment for natural selection of which trees are better adapted to survive. It could also result in understory plants being trampled, disease (e.g., pitch canker) being spread by tree removal equipment that is not properly disinfected, remaining trees being damaged, and wildlife being disturbed. Recommendation SH-29.1 also addresses this concern.

The LCP also requires tree replacement at a one-to-one mitigation ratio, with exceptions. Although the LCP does allow for thinning trees without a permit if pines are less than 12 inches in diameter, removal of any native tree regardless of size that is associated with new residential development is required to be replaced at a mitigation ratio of 1 to 1 unless this will cause overcrowding or an

unhealthy forest environment.⁹⁸ The County relies on forest management plans to make this evaluation (i.e., not recommend one-to-one replacement). But according to emerging research, crowding occurs naturally and will allow for the most genetic diversity and allow the strongest trees to survive that will perpetuate the species.⁹⁹ In at least two instances forest management plans recommended replacement for only those pine trees 12 inches or greater in diameter that were to be removed, stating that this is what the County requires.¹⁰⁰ This was an incorrect reading of the LCP, which although it defines significant trees as those over 12 inches in diameter, does not limit the replacement policy to only removing these larger trees. In addition, one of these permits recommended replacement with two other native species due to pitch canker disease and the lack of disease resistant strains of Monterey pine.¹⁰¹ These three cases raise some concern that the regulatory community may be implementing these policies without sufficient use of scientific data or communication with the scientific community. It also reflects a need to update the County's LCP to address a new issue. Forest management plans need to account for and address pine pitch canker, as provided for in Recommendation SH-29.7. To the County's credit, it has embraced having the forest management plans and coastal permits address a series of pitch canker measures developed in conjunction with the Coastal Commission.

Certainly, tree replacement has helped preserve some of the forested character of the area and is an effective mitigation measure to apply. Ecologically, however, tree replacement may be of limited value for the following reasons:

- The locations and densities of the replacement trees may not be optimum. The ability to replace trees on the same site where development occurs is often constrained by a small lot size and the extent of existing tree cover. Thus, the required replacement trees may be too close to other replacement trees or existing trees (as noted in some forest management plans), to grow to their full potential and provide habitat values equivalent to the trees removed. These constraints result in a loss of genetic diversity. Genetic diversity could enable the forest to be more resilient to pathogens, pests and diseases, such as pitch canker and others that may affect the forest in the future.
- The type of habitat is different. Irrespective of the fact that the overall number of trees may be maintained, or even increased, the overall habitat type is changed by the introduction of residential development, golf courses and human activity. Indeed, the urbanized forest is much different, and arguably less biologically productive, than the undeveloped areas of the forest.

The LCP's use of forest management plans to address all of these concerns continues to have value, but also has limitations. Although the LCP requires replacement of all Monterey pine regardless of

⁹⁸ *Del Monte Forest LUP* Policy 36; *Code* Section 20.147.050.D.4

⁹⁹ Personal Communication, Dr. Deborah L. Rogers, Assistant Research Geneticist, Genetic Resources Conservation Program Division of Agriculture and Natural Resources University of California Davis, CA.

¹⁰⁰ County coastal permits PLN00002 (3-MCO-01-198) and PLN990149 (3-MCO-01-351).

¹⁰¹ County coastal permit PLN000021 (3-MCO-01-198).

size when removed as part of residential development, a forest management plan is only required when trees greater than 12 inches are to be removed. Thus, foresters are not required to assess the cumulative impacts associated with removing smaller trees (or habitat generally) on the overall health of the forest. Moreover, the foresters tend to concentrate on protecting forest character of the particular site that they are hired to analyze. Review of forest management plans reveals that they lack assessments of cumulative impacts of tree removal and impacts of development in relation to the surrounding parcels and the forest in general. The plans typically do not address maintaining and promoting a contiguous forest canopy and understory habitat.

Moreover, forest management plan requirements are not designed to produce a biological or environmental assessment. This concern is addressed in Issue SH-9: Tree Removal, which includes recommendations for coordination of required biological surveys and forest management plans. Monterey County's implementation of its LCP was deficient in often not requiring biologic reports for development in the pine forest. (See also Issue SH-3: Biologic Reports that includes recommendations to ensure that biologic survey conclusions are based on LCP policy.) Also, to be truly effective, there would have to be forest management plans for every parcel in the forest, they would have to be coordinated, and they would have to be implemented in perpetuity. A review of aerial photographs supports these findings. The photos clearly show a continued loss of forest canopy cover since 1988 when the County began LCP implementation.

Finally, the LCP and the FMP process need to be revised to provide mitigation mechanisms for habitat protection when new development must be approved in Monterey pine forest ESHA (see Recommendations SH-29.3 and SH-29.4). As mentioned, off-site mitigation should be required for the disturbance envelopes of new development. In addition, long-term protection of remaining habitat on site needs to be assured, through the use of deed restrictions and on-going restoration and management obligations on the habitat parcels. Existing LCP tools for assuring these ESHA protections should be evaluated for effectiveness in application to the Monterey pine forest situation as part of a comprehensive forest management plan (see Recommendation SH-29.4). Cooperation among the various entities that have a stake in management is desirable (see Recommendation SH-29.11).

Managing Monterey Pine Forest Habitat

Finally, the LCP should be updated to provide a framework for more comprehensive Monterey pine forest habitat management based on our improved understandings and current environmental circumstances. This should include updated policies, standards, and management measures to address long-term preservation of identified habitat, protection of genetic diversity, management of pitch canker, new development and redevelopment within the forest canopy, and restoration of suitable habitat areas or currently degraded habitats. Specific review and updating of current management guidance, such as the Shepherd's Knoll OSAC standards, is needed. For example, non-native rye grass should not be used to sow the understory of restoration areas. Thus, Recommendation SH-29.6 calls for preparation of a guidance document for evaluating Monterey pine forest. Ultimately, site-specific implementation of Monterey pine protection measures should be guided by the framework of a comprehensive plan that evaluates remaining pine habitat areas in

the context of the entire forest area (see Recommendation SH-29.4). One aspect of this planning could be preparation of the guidance document. Such planning would provide a feedback loop to the evaluations of individual forest areas, for the purpose of better understanding and protecting its ecological value in the forest as a whole. In short, given current understandings of Monterey pine forest ecology, the regulatory emphasis should be shifted to stress a strategy of preserving suitable growing areas (i.e., habitat areas), rather than the current strategy of protecting (or replanting) individual trees.

Conclusion

In conclusion, the observations and scientific information presented herein would suggest the need to protect the remaining native Monterey pine trees (even those infected with pitch canker) and the forest area, as well as to create opportunities for some forest restoration and expansion. The language of some LCP policies would be supportive of these objectives, such as the preference for long-term protection of the forest resource with consideration of forest plant associations, native soil cover, aesthetic values, and maintenance of the overall health of the stand. However, other provisions are being interpreted to find that Monterey Pine is not ESHA, allow new subdivisions in the forest, only require minimizing tree removal, allow for replacements, and exempt small tree removal from review, and therefore serve both directly and indirectly to thwart these objectives. And as noted, the County has not fully carried out even these policies to the degree that they could. Thus, the forest area continues to decline and the protection of ESHA as required by the Coastal Act is in jeopardy.

This review reveals concern for preserving the integrity of the Monterey pine forest in the future, especially in light of Measure A, which would entail significant impacts to Monterey pine forest, and in light of on-going residential development impacts. The evidence is substantial that Monterey pine forest is ESHA, except perhaps under a limited set of site-specific circumstances where little or no native habitat is present or it is so degraded as to not constitute habitat. While the certified LCP provides the general tools to provide protection of Monterey pine ESHA, amendments are needed to update and make clear the significance and importance of protecting Monterey pine forest habitat in Monterey County. Together, Recommendations SH-29.1, SH-29.3, SH-29.4, SH-29.6, and SH-29.7 would provide such a necessary framework consistent with the Coastal Act. Fortunately, the existing B-8 zoning has resulted in the protection of many undeveloped tracts of pine forest to date, and needs to remain in place until comprehensive pine forest planning has occurred (see Recommendation SH-29.5). The concerns noted with the pine-specific policies will be magnified if the County continues to interpret the LCP such that the Monterey pine forest is not considered as environmentally sensitive habitat in the future. Treating the entire pine forest as ESHA means that many of the basic land use designations of the original *LUP* are outdated, as are those included in Measure A (see Commission staff comments on Measure A for more detail). In such situations, a reevaluation of the entire land use plan's designations and densities is preferable to case-by-case decision-making.

Additionally, the effort to manage the forest through individual forest management plans required for new development or tree cutting needs to be supplemented by an overall framework. Individual

forest management plans need to be written in the context of any overall forest management plan to be truly effective, and the whole forest needs to be covered. And research needs to continue as to how best to protect and manage the sensitive forest habitat (see Recommendation SH-29.9).

Finally, it should be noted that the Monterey pine habitat extends into the Carmel Area portion of the Coastal Zone, and portions of the Cities of Pacific Grove and Carmel-by-the-Sea's coastal zone. The forest also extends outside the coastal zone in the portion of Del Monte Forest that was removed from the Coastal Zone, and areas in Monterey County and City of Monterey. Thus, implementation of the County LCP alone will not be sufficient to protect the entire Monterey Peninsula endemic pine forest habitat.

c. Issue SH-30: Protection of Western Snowy Plover Habitat

This subchapter addresses the following concern identified through issue scoping: **Ensure that measures will be taken to protect the Western snowy plover from adverse impacts, including those associated with public access and large public events.**

The Western snowy plover (*Charadrius alexandrinus nivosus* – coastal population) was listed as threatened under the Federal Endangered Species Act in 1993 due to habitat loss and disturbance throughout its coastal breeding range. The current LCP, certified in 1988 prior to listing of this species, does not directly reference or address the habitat needs of the Western snowy plover. Although it does have protective policies for environmentally sensitive habitats and procedures for preparation of biologic reports, an update of the LCP could provide more explicit guidance for protecting this species and habitat. Currently, efforts are being considered and taken on beaches in Northern Monterey County to protect the Western snowy plover.¹⁰² Although the County has not yet acted on any coastal permits, actions by the Commission on some projects adjacent to Monterey County can provide some guidance for developing updated policies. For example, Commission review of breaching activities at the Pajaro River identified the need to mitigate for potential impacts to snowy plover species and habitat.¹⁰³ The “Interim Snowy Plover Management Plan for Vandenberg AFB” along the Santa Barbara coast dealt with managing beach activities to balance impacts to public access with protection of the species and habitat.¹⁰⁴ The proposed Pelican Point riverwall at Zmudowski State Beach at the confluence of the Pajaro River, Watsonville Slough and Monterey Bay also addressed protection of critical habitat for the plover.¹⁰⁵

Because there is significant new information about this threatened species, the LCP should ensure long-term protection of the snowy plover and its habitat. The current LCP relies heavily on biological consultant's reports to identify habitat and measures to avoid and mitigate impacts, but protection could be enhanced if the LCP contained more specific guidance for preparing such

¹⁰² California Department of Parks and Recreation, *Draft Western Snowy Plover Habitat Management Plan for the North Beaches of the Monterey District*, January 2001.

¹⁰³ Coastal Commission permit 3-97-047.

¹⁰⁴ Coastal Commission consistency determination CD-89-02.

¹⁰⁵ Coastal Commission permits 3-97-047 and 3-02-091.

reports. Recommendation SH-30.1 suggests development of improved guidance for preparation of biological reports to increase protection of plovers and plover habitat. Recommendations in Issues SH-1 ESHA Identification, SH-6 Mitigation for Habitat Loss, and SH-15 Public Agency Coordination outline some of the elements that would be in a guidance document, including how to identify environmentally sensitive habitat areas and mitigation measures for any adverse impacts. Preparation of such guidance will help assure that adequate habitat is identified and management measures are developed to ensure full protection of the species consistent with the Coastal Act. Table SH-30a provides an example of the format that a guidance document for Western snowy plover could take and its contents. Such guidance can be developed and provided, perhaps in loose-leaf form, for each environmentally sensitive habitat area. See also recommendations under Issues SH-14: Predator Management; SH-31 Protection of Coastal Dunes, and PA-2: Public Access in ESHA which are relevant to protecting western snowy plover habitat.

Table SH-30a Example of Potential Guidance Document Format and Information to be Included when Identifying and Describing Western Snowy Plover ESHA

Name of ESHA: <i>Western Snowy plover (WSP)</i>
Basis for ESHA Determination: <i>Listed as a federally threatened species and a State species of special concern</i>
Background Information: <i>Western snowy plovers, <i>Charadrius alexandrinus nivosus</i> - coastal population - are small sand colored shorebirds that nest and overwinter along the Pacific coast from southern Washington to Baja California. Snowy plovers nest in loose colonies and are site-faithful nesters, returning to successful nesting sites year after year. Snowy plovers forage for invertebrates on wet sand areas of intertidal zones, in dry, sandy areas above high tide lines, on salt pans, and along edges of salt marshes and salt ponds. Human recreational use on beaches, unrestrained dogs, encroachment of habitat by exotic European beach grass (<i>Ammophila arenaria</i>), predation by native and non-native mammalian and avian predators, and operations and maintenance activities by private and public land managers can threaten and disturb these birds.</i>
Locations: <i>Sandy beaches, dunes, creek and stream mouths; Salt pond complex adjacent to Elkhorn Slough.</i>
Habitat Delineation: <i>Snowy plover nesting, foraging, and wintering habitat includes coastal sand pits, dune-backed beaches, unvegetated beach strands, open areas around estuaries and on beaches at creek and river mouths. Dune-backed beaches, sand spits, beaches at creek/river mouths, and salt pans are the preferred habitat. Plovers feed on the wet sand below the tide line, on insects in dry sand, and on flies from piles of kelp. Plovers rest in depressions in the dry sand, sometimes taking shelter behind wave-cast debris. Nests are usually a simple scrape in the dry sand, sometimes lined</i>

*with shell. The breeding season for this bird can start in early March and, with multiple nesting attempts, may run as late as the end of September.*¹⁰⁶

Acceptable Resource-Dependent Uses In This ESHA: *Scientific study; Habitat enhancement measures; Limited public access that does not disturb the plover*

Mitigation Measures for Activities Allowed in ESHA: *For any scientific study, obtain all applicable permits for researching endangered species. Schedule any habitat enhancement measures activities to occur outside of the nesting season.*

Nesting and foraging areas should be protected from disturbance while balancing the need to maintain public access to the maximum extent possible. Existing public access may need to be limited in the most environmentally sensitive habitat areas where protection of nesting and foraging areas is not possible without curtailing access. The boundaries of areas considered pristine or prime habitat should be delineated and access may be restricted, especially from mid-February to mid-September, based on site-specific evaluation. Restrict and regulate vehicle use in vicinity of WSP habitat to avoid disturbance to nesting areas and birds.

Use the most effective measures currently known for protection of nesting and foraging habitat, such as symbolic fencing (ropes or wire) with interpretive signs informing the public to respect the fenced area, enforcement of leash laws, and enclosure fencing where necessary to prevent access by unleashed animals.

If plover habitat is destroyed, purchase and protect high quality habitat elsewhere.

Monitoring Protocol and Success Criteria For Mitigation:

*Monitoring:*¹⁰⁷

Ensure that monitoring efforts are established and maintained to provide information on nesting activities, including nesting locations, threats to nesting birds, eggs, and young, and population recruitment (success of fledgling young).

*Monitoring Protocol*¹⁰⁸:

- *Data regarding use trends and environmental resources can provide important information*

¹⁰⁶ Adapted from California Department of Parks and Recreation, *Western Snowy Plover Systemwide Management Guidelines*, March 2002.

¹⁰⁷ From Western Snowy Plover Management Directives memorandum distributed to California Department of Parks and Recreation District Superintendents June 28, 2002, as follow-up to release of Western Snowy Plover Systemwide Management Guidelines, released March 2002.

¹⁰⁸ Modified from Point Reyes Bird Observatory, "Nesting of the California Least Tern and Snowy Plover at Oceano Dunes State Vehicular Recreation Area, San Luis Obispo County, California in 2002" prepared for the California Department of Parks and Recreation, November 2002.

regarding the effectiveness of various management approaches to protect snowy plovers.

- *Monitoring of plover habitat should be conducted daily during nesting season to locate nests and broods, and, when needed, to trigger protective measures for vulnerable nests or broods. Monitoring goals should include locating all plover nests in the study area, protecting nests when necessary, ascertaining nest fate, and banding plover chicks to provide an accurate estimate of fledging rate.*
- *Monitoring should be conducted in a manner to minimize disturbance or adverse effects on all adult birds, nests, or chicks.*
- *Seasonal exclosures should be monitored by periodic entry on foot as well as extensive observation with binoculars and spotting scopes from outside the exclosure. Monitoring of exclosures may also be conducted using a vehicle as a blind, by driving very slowly on smooth, hard-packed sand in the lower exposed intertidal zone.*
- *Exclusion fences should be used and located at least 100 feet away from any known nesting site. Extending the period of time for seasonal protective fencing through fall and winter may facilitate the development of natural habitat features (e.g., micro-topography) that can enhance nesting and chick rearing habitat.*
- *Estimate snowy plover clutch hatching dates from known egg laying dates or by floating eggs. Nests are considered to have hatched if at least one egg has hatched. Each brood of chicks should be given a unique color band combination. Plover chicks surviving to 28 days or older from the time of hatch may be considered fledged. Map locations of nests, seasonal exclosures and buffer areas using GPS technology. Identify the presence of potential mammalian and avian predators by direct observation of predators and signs (e.g., tracks, scat, prey remains).*
- *A predator management plan should be developed and implemented to identify appropriate responses to mammalian and avian predators. Protocols should ensure that management actions are implemented in a timely manner for individual predators posing serious threats to plover reproductive success. Shrikes, raptors, corvids, and coyotes should be among the avian and mammalian predators included in the management plan.*

*Success Criteria*¹⁰⁹:

Objective: To achieve well-distributed increases in numbers and productivity of breeding adult birds. Protection of snowy plover habitat and protection of snowy plover broods and nests should be measures of success. The USFWS Draft Recovery Plan for the Pacific Coast population of the Western snowy plover includes the following recovery criteria: 1) maintain for 10 years an average

¹⁰⁹ Adapted from US Fish and Wildlife Service Region 1, *Western Snowy Plover (Charadrius alexandrinus nivosus) Pacific Coast Population Draft Recovery Plan*, May 2001.

of 400 breeding adults in the Sonoma to Monterey recovery unit; 2) maintain a 5-year average productivity of at least 1.0 fledged chick per male in each recovery unit in the last 5 years prior to delisting; 3) have in place participation plans among cooperating agencies, landowners and conservation organizations to assure protection and management of breeding, wintering and migration areas listed in Appendix B of Recovery Plan, the maintain the subpopulation sizes, and average productivity specified in criteria 1 and 2 above.

Buffer Or Setback Requirements: *Habitat delineation should include an additional buffer of at least 100-feet, and the habitat and buffer should be fenced. The size of areas where public access may need to be restricted shall be determined by site specific evaluation of the extent of habitat area, measurement of distance at which snowy plovers react to disturbance, and a determination or finding by a qualified biologist on the preferred habitat for snowy plovers.*

Types Of Uses Allowed In The Buffer: *Limited public access that does not disturb the plover; e.g., no camping, fires, fireworks, equestrian use, hang gliding, kite flying, ball tossing, and the like.*

Mitigation Measures Required For New Development Adjacent To Or Nearby The Habitat To Prevent Adverse Impacts: *Conduct monitoring and implement a predator management plan. Maintain coastal dune habitat and restore degraded habitat areas. Maintain and restore native landscaping. Require dogs to be on leashes where disturbance to plover would be avoided, otherwise prohibit dogs from beaches that provide plover nesting habitat*

Agencies To Consult With: *US Fish & Wildlife Service; California Department of Fish and Game; California Department of Parks and Recreation; Point Reyes Bird Observatory*

Actions To Take: *Prepare a regional Habitat Conservation Plan (HCP) to protect western snowy plover nesting, foraging, and over-wintering habitat pursuant to Section 10 of the Endangered Species Act. The HCP shall address all beaches within the County's jurisdiction, not already covered by other Habitat Conservation Plans. Monitor and manage wintering and migration areas to maximize snowy plover population survival. Review progress towards snowy plover recovery annually and revise recovery efforts as appropriate. Work with land owners/managers to make certain that current and future use of these habitat areas are designed and managed in accordance with habitat continuance and enhancement. Dedicate staff and funding toward snowy plover coordination, recovery implementation, and enforcement. Undertake public information and education programs with regard to snowy plover protection. Maintain coastal dune habitat and restore degraded areas as appropriate. Eliminate European beach grass intruding on nesting areas.*

Reference Documents: <http://www.friendsofthedunes.org/snowy.plover/snowy.plover.shtml#top>. *Draft Western Snowy Plover Habitat Management Plan for the North Beaches of the Monterey District, California Department of Parks and Recreation. Draft Snowy Plover Recovery Plan, US Fish & Wildlife Service, May 2001. Western Snowy Plover Systemwide Management Guidelines, prepared by California Department of Parks and Recreation, March 2002; and Western Snowy*

Plover Management Directives Memorandum, dated June 28, 2002.

d. Issue SH-31: Protection of Coastal Dunes

This subchapter addresses the following concern identified through issue scoping: **Ensure that coastal dunes are appropriately protected as environmentally sensitive habitat with regards to development and public use.**

Sand dunes occur along portions of the County's coastal zone and in neighboring jurisdictions. Some of the County's sand dunes are publicly owned (e.g., Salinas River State Beach, Salinas River National Wildlife Refuge, Fort Ord). Sand dunes in the Carmel Area are limited to locations on Carmel River State Beach. Privately owned dunes include commercial/institutional ownerships in Moss Landing, golf courses in Del Monte Forest, and 22 residential parcels in Del Monte Forest.¹¹⁰ When dune lots are developed in the Forest, required easements are given to the Del Monte Forest Foundation, a non-profit organization. Recently, the Foundation has begun annual monitoring for permit condition compliance and ecosystem health and follow-up with recommendations to property owners and reporting to the Foundation board.¹¹¹ This effort should be continued as stated in Recommendation SH-31.4.

The LCP recognizes dunes as environmentally sensitive habitat areas and contains specific policies for their protection for all segments except the Carmel Area.¹¹² This means that non-resource-dependent development would be prohibited on coastal dunes. However, the last sentence of *Del Monte Forest Land Use Plan* policy 16 states that lots of record in named dune areas may be developed provided new adverse impacts are prevented and enhancement measures are undertaken. For the other segments where there is no such explicit exemption, development on lots of record containing ESHA that otherwise might not be allowed, may be permitted under *Code* Section 20.02.060.B, provided in part,

¹¹⁰ In Del Monte Forest three types of dunes are present: youngest, middle-aged, and oldest, according to Jones & Stokes Associates, Inc., *The Monterey Ecological Staircase: The Nature of Vegetation and Soils on Different Geomorphic Surfaces on the Monterey Peninsula with an Emphasis on Monterey Pine Forest*, September 1994. The youngest dunes have a dune scrub habitat consisting of Bush monkeyflower, mock heather, bush lupine, beach sagewort, and coast buckwheat. The middle-aged and oldest dunes support a Monterey pine forest habitat, but do contain some species associated with dune habitat.

¹¹¹ Personal communication, Steve Staub, September 4, 2003.

¹¹² Policies specifically referencing dunes include:

Del Monte Forest LUP: Policy 16 states that native sand dune habitat along the shore of the Spanish Bay planning area, on Signal Hill, and adjacent to 17-mile drive in Spyglass Cypress planning area shall be preserved through scenic easement or conservation easement. Existing lots of record in these dune areas may be developed provided new adverse impacts are prevented and enhancement measures are undertaken;

Del Monte Forest LUP Policy 18 limits uses of sand dune habitat to scientific, educational or recreational activities dependent on the resource –except in Spanish Bay

Del Monte Forest LUP Policy 19 restricts parking along 17-mile drive to designated turnouts to prevent further degradation of dune habitat.

Big Sur LUP Policy 3.3.3(1) restricts uses of sand dune habitat to scientific & educational activities. Recreation areas are to be directed away from the sand dunes and toward the beach. Prohibits all off-road vehicle use in dune areas

... that any development being approved is the least environmentally damaging alternative project. In order to make this finding, the development shall be required to minimize development of structures and impervious surfaces to the amount needed to reduce environmental impacts to the greatest extent possible and shall be required to locate the development on the least environmentally sensitive portion of the parcel.

This section is more protective of ESHAs such as dunes than *Del Monte Forest LUP* policy 16. Also, policy 16 does not explicitly distinguish between developments on vacant parcels versus intensification of use. As a result, the LCP does not fully protect this environmentally sensitive habitat area in Del Monte Forest. Recommendation SH-31.1 addresses this concern and would strengthen protection of dune habitat in the *Del Monte Forest LUP*, by deleting the last sentence of policy 16. That would leave *Code Section 20.02.060.B* as the operative provision when addressing development on dunes along with Recommendation SH-28.4 which gives more specific guidance for developing parcels that contain ESHA, such as dunes.

The Commission has addressed protection of the Monterey Dune system in permit review. Given that the natural dune system has been reduced and fragmented increasing the threats to survival of its unique species, each incremental loss of dune area constitutes an adverse impact. However, absent more explicit LCP language, the County has not fully addressed the cumulative impacts to the overall dune system in review of individual permits. This matter recently was highlighted in an appeal of a County-issued permit to expand an existing 2,250 square foot house with 600 square feet of paving to a 5,469 square foot house with 5,209 square feet of paving on Seventeen Mile Drive in the Asilomar dunes area of Del Monte Forest.¹¹³ The Commission found that coastal dunes in the County are an extremely limited environmental resource of statewide significance:

Oceanfront dunes provide unique, sensitive habitat values. Throughout its history, the Commission has placed a high priority on the protection and preservation of dune systems, including the Asilomar Dune system (Examples include Bonnano, Griggs & Miller 3-83-110; Page 3-96-102; Knight 3-99-071 Baldacci 3-01-013 and Child 3-02-023). The native landscape of the Asilomar Dunes comprises a community of coastal plants and associated animal life distinct from all other areas of California. For these reasons, this landscape is worthy of maximum protection and restoration.

Coastal dune ecosystems are threatened by the loss, fragmentation and disruption of habitat associated with development. For example, of the 27 dune fields in coastal California, the Monterey Bay dune system is one of the largest covering about 40 square miles. However, less than half of the dune field has survived urbanization, conversion to military or agricultural uses, sand mining, and shoreline erosion...

One of the most critical functions of the dune system is its role as a habitat for a very unique flora and fauna. Species present in this habitat are specially adapted to the conditions and opportunities found in dunes. Dune plants in particular play a special role by both

¹¹³ Coastal Commission coastal permit appeal A-3-MCO-02-058, findings adopted 9-10-03 (County coastal permit PLN000239).

stabilizing the dunes from the effects of wind erosion and hosting rare fauna. However, as the natural dune system has been reduced and fragmented, the risk of extinction has increased for many of these species. Thus, each new impact within the dunes system has and will continue to contribute to the cumulative decline of these species.

Because of the cumulative impacts to the overall dune system from incremental development, the LCP should ensure long-term protection of the dune system. Recommendation SH-31.3 suggests development of an overall dune conservation and management plan to guide preservation and restoration of the Asilomar Dune complex. The current LCP relies heavily on biological consultant's reports to identify the dune habitat and measures to avoid and mitigate impacts, but protection could be enhanced if the LCP contained more specific guidance for preparing such reports. In addition, assessments should emphasize identifying and protecting the overall dune system from cumulative impacts. Recommendation SH-31.2 suggests development of improved guidance for preparation of biological reports to increase protection of dune habitat. Recommendations in Issues SH-1 ESHA Identification, SH-6 Mitigation for Habitat Loss, and SH-15 Public Agency Coordination outline some of the elements that would be in a guidance document, including how to identify environmentally sensitive habitat areas and mitigation measures for any adverse impacts. Development of such guidance will help assure that adequate habitat is identified and management measures are developed to ensure full protection of the overall dune system consistent with the Coastal Act. Table SH-31a provides an example of the format that a guidance document for coastal sand dunes could take and its contents. Such guidance can be developed and provided, perhaps in loose-leaf form for each environmentally sensitive habitat area.

Table SH-31a Example of Potential Guidance Document Format and Information to be Included when Identifying and Describing Coastal Dune ESHA

<p>Name of ESHA: <i>Sand dunes</i></p>
<p>Basis for ESHA Determination: <i>Sand dunes constitute a rare habitat that supports a very unique flora and fauna. Species present in this habitat are specially adapted to the conditions and opportunities found in dunes. Dune plants in particular play a special role by both stabilizing the dunes from the effects of wind erosion and hosting rare fauna. However, as the natural dune system has been reduced and fragmented, the risk of extinction has increased for many of these species.</i></p> <p><i>Rare and endangered native dune plants in the Asilomar Dune complex include Menzie's wallflower (only three known locales for the species), Tidestrom's lupine, Dune gilia, Coastal dunes milk-vetch, Beach layia, and Monterey spineflower. The dunes also provide habitat for rare and endangered animal species, including Smith's blue butterfly, the globose dune beetle, and the black legless lizard.</i></p> <p><i>Rare and endangered native plant and animal species in the Flandrian dunes of the Monterey Dune</i></p>

complex include Coast wallflower, Menzie's wallflower (only three known locales for the species), Dune gilia, and Monterey spineflower. Listed rare threatened, endangered, and other sensitive plant species are found in both Recent and Flandrian dunes. Examples include Seaside painted cup, and both Dune and Coast buckwheat. The buckwheat is a host plant for the endangered Smith's blue butterfly. The globose dune beetle is found along the beach strand on the seaward margin of recent dunes, and the endangered Snowy plover nests on barren areas in both Recent and Flandrian dunes. The Salinas kangaroo rat was historically found on the native grasslands of the pre-Flandrian dunes north of Marina. Even if this extremely rare species is no longer present, the remnant pre-Flandrian dune surface west of the Highway 1 freeway represents an appropriate location for reintroduction. The western snowy plover, federally listed as a threatened species and a California species of special concern, forages along the shoreline and nests in the foredunes.

Background Information: Coastal dunes are sand accumulations formed by aeolian (or wind-transported) deposition. Sand dunes may occur wherever there is a large supply of sand, enough wind to transport individual sand particles, and a place in which they can accumulate. The two main types of coastal sand dunes are (1) vegetated and (2) transverse dune ridges, which are generally migrating and bare of vegetation. Dunes consist of various zones: 1. Beach and foredunes, which have rapidly shifting sand and are constantly exposed to wind and salt spray. 2. Mid-dunes, which are slightly more elevated and protected, with less wind, less salt spray, and less blowing sand, and which have more upright, bushy and denser vegetation. 3. Back dunes, which are usually wider, higher, and have more relief, and are well stabilized. 4. Transition zones to inland communities.¹¹⁴

Locations:

Asilomar area: Spanish Bay resort complex, seaward portions of Monterey Peninsula Country Club golf course, both sides of 17 Mile Drive from Seal Rock Creek to Fan Shell Beach, and inland to include the seaward portions of the Spyglass Golf Course and the dunes around the abandoned Spyglass Quarry.

North Monterey County: All of former Ft. Ord, except for small areas within the Toro and Salinas River floodplains; all of the Armstrong Ranch and Lonestar Industries lands north of Marina, except for the low-lying agricultural bottomlands in the Salinas River floodplain; the dune strand seaward of the Old Salinas River and the artichoke fields west of Hwy. 1; Watertank Hill and the undeveloped back beach areas seaward of the Old Salinas River channel in Moss Landing; and the dune strand seaward of the abandoned Pajaro Valley Consolidated Rail Road alignment north of

Moss Landing. The natural dune complex does not include the dune-like habitat mitigation area alongside Hwy. 1, north of the Elkhorn Yacht Club.

¹¹⁴ Monterey Bay Dune Coalition, *Monterey Bay Dunes: A Strategy for Preservation*, May 1991, page 15.

Habitat Delineation:

Entire area of active sand dunes, with or without vegetation cover is environmentally sensitive coastal dune habitat.

Additionally, for stable, vegetated dunes, the following factors should be evaluated in delineating environmentally sensitive habitat:

- *Presence of typical sand dune species (see above);*
- *Presence of species and plant communities that are ESHA in their own right (e.g., Monterey pine forest)*
- *Presence of the physical substrates that support or could support the above species.*

Acceptable Resource-Dependent Uses In This ESHA:

- *Scientific study*
- *Habitat enhancement measures, particularly including: grading to restore natural dune landforms; temporary open-slat sand fences to minimize wind erosion effects; removal of exotic species; removal of lead and other toxic substances; removal of non-resource dependent development; and installations needed to properly enable and manage public use within dune habitats, such as interpretive exhibits, boardwalks, wire mesh plover nesting enclosures and bird viewing blinds*
- *Limited public access*
- *In limited circumstances and areas, and in order to restore native habitat, grazing with associated minor agricultural improvements such as electric fencing, watering troughs, acceptable only inland from Recent and Flandrian-era dunes.*

Mitigation Measures for Development in Habitat:

- *For scientific study: Install any necessary structures that can not be feasibly located elsewhere only in existing disturbed areas*
- *For public access: Install boardwalks through dunes; prepare and follow access management plans for any new areas that are opened to public use, or where a substantial increase in public use can be expected as a result of the project*
- *For residences allowed on existing lots of record to prevent an unconstitutional takings: minimize footprint; locate on least sensitive portion of property; locate to minimize fragmenting the habitat; protect entire remainder of property; provide compensatory*

mitigation (see below); maintain dune stability and integrity; prevent erosion and prepare and follow an erosion control plan

- *For each acre of disturbed dune perform compensatory mitigation at 3 acres of newly restored habitat; choose a mitigation area that is located within a naturally occurring dune system that is unnaturally without vegetation; fence proposed restoration area with continuous exclusionary fencing, at least 4-feet high maintained throughout construction period; collect seeds from sand dunes as close by as possible; use high quality sand for dune creation areas; plant native species appropriate to the site according to an approved planting table; deed restrict restoration area for permanent dune habitat.*
- *Remove or control of invasive plant species that were not components of the historic vegetation*

Monitoring Protocol and Success Criteria For Restoration Mitigation: *Identify a healthy, protected dune area as a reference site for comparing the restoration site; Based on observations at the reference site, set revegetation goals, such as at least 10% of the restoration area shall be covered with native plants at the end of one year; 25% coverage at the end of two years; 40% coverage at the end of three years; Monitor for at least five years using a qualified biologist and prepare monitoring reports; Strive for absence of exotic species (set target such as never to exceed 1% of area based on reference site); Assess final performance criteria three years after the end of all maintenance and remediation activities, except weeding; Maintain good health of plants and of dune contour.*

Buffer Or Setback Requirements: *No generic standard; determine on a case-by-case basis, if a buffer is necessary and, if so, the criteria for uses or management measures for the buffer.*

Uses Allowed In The Buffer: *If a residence is allowed in dunes then adjacent to the residential structure allow: wooden boardwalks, not to exceed 4 ft. in width; no other structures, paving or landscaping that reduces the amount of sandy surface available for native plant growth; residential landscaping and maintenance activities that do not materially harm, or have the potential to harm, the viability of the protected natural dune habitat.*

Mitigation Measures Required For New Development Adjacent To or Nearby The Habitat To Prevent Adverse Impacts: *No generic measures; determine on a case-by-case basis*

Agencies To Consult: *US Fish & Wildlife Service; State Parks and Recreation; California Department of Fish and Game, the California Department of Parks and Recreation,*

Actions To Take:

- *Prepare a management plan for the dune system*
- *Management of coastal dunes generally requires exotic control and simultaneous control of unnatural erosion. The latter may dictate methods, e.g. poisoning iceplant and leaving the root structure rather than hand removal in some cases. It may also require planting native vegetation. It may require interim physical stabilization with sand fences, rice straw, jute netting, etc.*

Reference Documents:

William S. Cooper, *Coastal Dunes of California*. The Geological Society of America, Memoir 104. Boulder, CO, 1967.

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