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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 <u>habitat</u> 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
Monterey pine -- Undeveloped	Monterey pine forest with natural or relatively undisturbed understory	1881
Monterey pine -- Rural	Monterey pine forest with "rural" development underneath, lots greater than 1 acre	567
Monterey pine -- Suburban	Monterey pine canopy, usually over 20% cover with structures and yards underneath	634
Scattered *Monterey pine* -- Urban	Scattered Monterey pine, up to 20% canopy cover (golf course, urban parks)	53
Sparse *Monterey pine* -- 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
Allium hickmannii	Hickman's onion			CNPS 1B
Arctostaphylos pumila	Sandmat manzanita			CNPS 1B
Arctostaphylos hookeri ssp. *Hookeri*	Hooker's manzanita			CNPS 1B
Arctostaphylos montereyensis	Monterey Manzanita			CNPS 1B
Ceanothus cuneatus var. *rigidus*	Monterey ceanothus			CNPS List 4
Cordylanthus rigidus var. *littoralis*	Seaside bird's-beak		Endangered	CNPS 1B
Cupressus goveniana ssp. *goveniana*	Gowen cypress	Threatened (1998)		CNPS 1B
Cupressus macrocarpa	Monterey cypress			CNPS 1B
Ericameria fasciculata	Eastwood's ericameria			CNPS 1B
Horkelia cuneata ssp. *sericea*	Wedge-leaved horkelia			CNPS 1B
Lomatium parvifolium	Small-leaved lomatium			CNPS List 4
Malacothamnus palmeri var. *involucratus*	Carmel Valley Bush Mallow			CNPS 1B
Malacothrix saxatilis var. *arachnoidea*	Carmel Vally Malacothrix			CNPS 1B
Potentilla hickmannii	Hickman's cinquefoil	Endangered (1998)	Endangered	CNPS 1B
Pinus radiata	Monterey pine			CNPS 1B
Piperia yadonii	Yadon's rein orchid	Endangered (1998)		CNPS 1B
Piperia michaelii	Michael's Rein Orchid			CNPS List 4
Trifolium trichocalyx	Monterey clover	Endangered	Endangered	CNPS 1B
Trifolium polyodon (phase of Trifolium Variegatum)	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
Sorex ornatus salarius	Monterey ornate shrew			SSC
Neotoma fuscipes luciana	Monterey dusky-footed woodrat			SSC
Taxidea taxus	American badger			
Accipiter striatus	Sharp-shinned hawk			SSC
Accipiter cooperi	Cooper's hawk			SSC
Aquila chrysaetos	Golden Eagle			SSC
Falco peregrinus anatum	American Peregrine Falcon	De-listed	Endangered	SSC
Falco columbarius	Merlin			SSC
Cypseloides niger	Black swift			SSC
Rana aurora draytonii	California Red-legged frog	Threatened (1996)		SSC (1994)
Clemmys marmorata pallida	Southwestern pond turtle			SSC (1994)
Euphilotes enoptes smithi	Smith's Blue butterfly	Endangered		SSC
Antrozous pallidus	Pallid bat			SSC (2000)
Phrynosoma coronatum frontale	California horned lizard			SSC (1994)
Anniella pulchra nigra	California black legless lizard			SSC (1994)
Anniella pulchra pulchra	Silvery legless lizard			SSC (1994)
Danaus plexippus	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. Researcher 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 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.

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[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); 1permit 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 case[80] 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 EHSA 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 polices 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 EHSA 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 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 of 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 EHSA 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. Fortuitously, 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.