BIOLOGICAL RESOURCES OF THE DEL MONTE FOREST

SPECIAL-STATUS SPECIES

DEL MONTE FOREST PRESERVATION AND DEVELOPMENT PLAN

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1.0 INTRODUCTION

This report was prepared by Zander Associates at the request of the Pebble Beach Company to evaluate the rare, threatened, endangered or otherwise sensitive species of plants and animals that occur within the Del Monte Forest Preservation and Development Plan (DMF Plan) area. These species are referred to here as special-status species. [1] Many such species have been recorded from the Del Monte Forest over time and their preservation has been at the heart of all land use planning for the forest. Most notably the California Coastal Act, as implemented in the Del Monte Forest through the Monterey County Local Coastal Plan (LCP) and the Del Monte Forest Area Land Use Plan (LUP), sets a rigorous standard of protection of for rare, threatened, endangered and other sensitive species and their habitats and requires that any development be properly sited and designed to avoid impacts that could degrade these resources.

The DMF Plan was developed with the intent of preserving and protecting sensitive biological resources within the Plan area in perpetuity, while providing for reasonable and appropriate land uses consistent with the DMF LUP. In the case of special-status species, the DMF Plan has eliminated many of the land uses, especially residential development, associated with previous development plans that could have compromised these resources. In addition, facilities now proposed by the DMF Plan have been sited and designed to substantially reduce impacts on these species and the habitats that support them, and to maximize habitat restoration and enhancement opportunities.

This report considers the existing conditions and effects of the DMF Plan on special-status species within the Plan area. The report is based on previous documentation of these resources in the Plan area developed through analysis of the formerly proposed Pebble Beach Lot Program, supplemented by more recent, site-specific review conducted by Zander Associates in cooperation with various investigators (see Appendices). Species-specific resources were evaluated in the field during 1999, 2000 and 2001. Directed surveys and habitat evaluations for a set of wildlife species and thorough, seasonally-timed searches for plant species were conducted throughout the forest.

The following section of this report presents an overview of the special-status species known or expected to occur in the Del Monte Forest Plan area. Subsequent sections provide detail on each species, evaluate their relationship to DMF Plan elements as proposed and provide a general program for special-status species management.

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[1] Special-status species are defined as those plants and animals listed, proposed for listing, or candidates for listing as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) under the Federal Endangered Species Act (ESA); those listed or proposed for listing as rare, threatened, or endangered by the CDFG under the California Endangered Species Act (CESA); plants occurring on lists 1B and 2 of the California Native Plant Society's *Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2001); and animals designated as "Species of Special Concern" by the CDFG. Special-status species also include CNPS List 4 plants that are specifically mentioned in Appendix A of the Del Monte Forest Land Use Plan (see Table 1 for listing definitions).

2.0 OVERVIEW OF SPECIAL-STATUS SPECIES IN THE DMF PLANNING AREA

2.1 Species Occurrences

The Del Monte Forest supports a rich array of endemic, limited-range, sensitive or otherwise special plant and animal species. Partly because of its geographic location at a transitional ecological juncture between the drought-tolerant systems of southern California and the more temperate conditions of the north coast, partly because of the influences of a regime of relatively abundant winter rains combined with a pattern of summer fog, and partly because the coastal Monterey pine forest on the Monterey Peninsula provides unique ecological niches for its associated vegetation and wildlife, the Del Monte Forest is home to 19 special-status plants and seven special-status animals. Of these species, eleven of the plants, but none of the wildlife species, are listed as rare, threatened or endangered by either the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG). Table 1 lists these species and also presents information on their regulatory status, general habitat requirements and distribution. Map locations for most of these species are provided in the Plates attached to this document.

The potential for new or expanded occurrences of special-status species in the Del Monte Forest has also been considered by various investigators. In its environmental review of the previously proposed Pebble Beach Lot Program, EIP Associates, working for Monterey County, evaluated the potential occurrence of some 22 special-status plants and 28 special-status animals, including 19 species listed as rare, threatened or endangered by state or federal resource agencies (EIP Associates, 1997). The final Lot Program Environmental Impact Report (EIR) compiled data and provided mapped information on the special-status species actually found in the forest and also identified the potential for others, especially wildlife species, to occur based on habitat opportunity, range, distribution and other factors. Jones and Stokes Associates (JSA), working under contract to CDFG, listed eleven special-status wildlife species and 14 special status plants potentially associated with the Monterey pine forest at Monterey and also identified 14 "priority" species endemic to the central coast that are of particular concern in conservation planning for the forest (Table 2) (JSA, 1996b). JSA also collected baseline information on six species of rare plants endemic to the central coast, all of which occur in the Del Monte Forest (JSA, 1996a). In recent years, others, largely at the direction of the Pebble Beach Company, have conducted systematic searches for key target species to verify the record and to update previous surveys. Summary results of these surveys are provided below under the appropriate species categories and copies of reports and other relevant background data are provided in the Appendices.

2.2 Special-Status Species Conservation Planning

Species conservation has been an essential consideration of planning from the early days of developing the Land Use Plan for the Del Monte Forest. Recognizing the importance and sensitivity of coastal dune species such as Tidestrom's lupine (*Lupinus tidestromii* var. *tidestromii*), Menzies' wallflower (*Erysimum menziesii*) and Monterey Indian paint brush (*Castilleja latifolia*), remnant dunes at Signal Hill and Indian Village were established as original

TABLE 1
SPECIAL-STATUS SPECIES KNOWN OR EXPECTED TO OCCUR
IN THE DEL MONTE FOREST PLAN AREA

Species	Status [1,2] Fed/CA/CNPS	Habitat	Distribution
Plants			
Hickman's onion *Allium hickmanii*	-/-/1B	Closed-cone conifer forest, chaparral, and grasslands	Monterey Peninsula, Fort Ord, Monterey Airport, and San Luis Obispo County
Hooker's manzanita *Arctostaphylos hookeri* ssp. *hookeri*	-/-/1B	Closed-cone conifer forest, and coastal scrub	Extensive at Fort Ord; scattered occurrences in the Monterey Peninsula, Seaside and Monterey Airport
sandmat manzanita * *A. pumila*	-/-/1B	Closed-cone conifer forest, and coastal dunes	Extensive at Fort Ord: Prunedale Hills: Larkin Valley: scattered sites on Monterey Peninsula
coastal dunes milk vetch * *Astragalus tener* var. *titi*	E/E/1B	Coastal terrace prairie	Limited to occurrences along 17-Mile Drive on Monterey Peninsula
Monterey paint brush * *Castilleja latifolia*	-/-/4	Coastal dunes around Monterey Bay	Monterey and Santa Cruz Counties
Monterery ceanothus * *Ceanothus cuneatus* ssp. *rigidus*	-/-/4	Maritime chaparral: closed-cone conifer forest on sandy hills and flats	North Coastal Monterey County
Monterey spineflower *Chorizanthe pungens* var. *pungens*	T/-/1B	Coastal dunes around Monterey Bay	Coastal southern Santa Cruz and northern Monterey Counties: Salinas coastal plain
Gowen cypress * *Cupressus goveniana*	T/-/1B	Closed-cone conifer forest in Monterey County	Only two occurrences: Monterey Peninsula and Lobos Ranch
Monterey cypress * *C. macrocarpa*	-/-/1B	Closed-cone conifer forest in Monterey County	Immediate coast on Monterey Peninsula and Point Lobos Ranch
Eastwood's ericameria * *Ericameria fasiculata*	-/-/1B	Closed-cone conifer forest; maritime chaparral: coastal scrub	Most at Fort Ord: also at Monterey Airport, Monterey Peninsula, Toro Park, and Prunedale Hills
Menzies' wallflower * *Erysimum menziesii* ssp. *menziesii*	E/E/1B	Coastal dunes	Dune habitats on the Monterey Peninsula; Asilomar and Pebble Beach
sand gilia *Gilia tenuiflora* ssp. *arenaria*	E/T/1B	Coastal dunes; coastal scrub (sandy sites) around Monterey Bay	Salinas River Beach, Asilomar State Beach, from Point Pinos to Point Joe, Fort Ord
beach layia *Layia carnosa*	E/E/1B	Coastal dunes	Dune habitats on the Monterey Peninsula
Tidestrom's lupine * *Lupinus tidestromii*	E/E/1B	Coastal dunes	Dune habitats on the Monterey Peninsula
Monterey pine *Pinus radiata*	-/-/1B	Closed-cone conifer forest on poor soils in summer fog zone	Coastal areas near Monterey, Ano Nuevo, and Cambria: two Mexican islands near Baja California
Yadon's piperia *Piperia yadonii*	E/-/1B	Chaparral; coastal scrub; and closed-cone conifer forest	Northern coastal Monterey County
Hickman's cinquefoil * *Potentilla hickmanii*	E/E/1B	Coastal bluff scrub; closed-cone conifer forest	Only 2 locations – Monterey Peninsula and San Mateo County coast
Monterey clover * *T. trichocalyx*	E/E/1B	Closed-cone conifer forest in recently burned sites	Known from the Monterey Peninsula
Pacific Grove clover * *Trifolium polyodon*	-/R/1B	Closed-cone conifer forest; coastal prairie, and meadow on mesic sites	Known from the Monterey Peninsula and Point Lobos

TABLE 1 (cont'd)
SPECIAL-STATUS SPECIES KNOWN OR EXPECTED TO OCCUR

IN THE DEL MONTE FOREST PLAN AREA

Species	Status [1,2] Fed/CA/CNPS	Habitat	Distribution
Wildlife			
black legless lizard *Anniella pulchra nigra*	-/CSC	Requires loose sandy soil for burrowing, moisture, warmth, and plant cover. Mostly associated with sand dune habitat	Restricted to small populations along the coast in Monterey and northern San Luis Obispo County
coast horned lizard *Phrynosoma coronatum frontale*	-/CSC	Occurs in areas with friable sandy soils with suitable prey base (mostly ants)	Central Valley from Tehama south to Tulare County and Coast Ranges from Sonoma south to San Diego County
sharp-shinned hawk *Accipter striatus*	-/CSC	Found in riparian forests, conifer forests, and oak woodlands	Sierra, Cascade, Klamath, and north Coast Ranges; along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey Counties; winters throughout state except at high elevations; breeds and winters throughout North America
Monterey dusky-footed woodrat *Neotoma fuscipes luciana*	-/CSC	Maritime chaparral and woodlands with moderate to dense cover and abundant dead wood for nest construction	Restricted to Monterey County and northern San Luis Obispo County
ringtail *Bassariscus astutus*	-/FP	Widespread in riparian areas and brush stands, most forest habitats	Sierra Nevada and Coast Ranges and the Sacramento Valley; potentially occurs in riparian woodlands in the Chico area
Monterey ornate shrew *Sorex ornatus salarius*	-/CSC	Typically found in riparian habitats	Restricted to Monterey Bay region; historical occurrences at the mouth of the Salinas River and Moss Landing in Monterey County
Pallid bat *Antrozus pallidus*	-/CSC	Rocky outcrops, cliffs, and crevices for roosting; access to open habitats required for foraging	Low elevations throughout California

***** Indicates that species (or significant occurrence) is listed as Environmentally Sensitive Habitat Area (ESHA) in Appendix A of the Del Monte Forest Land Use Plan.

[1] Status =Status of species relative to the Federal and State Endangered Species Acts, Fish and Game Code and CEQA.
- Fed =Federal status.
- E =Federally listed as endangered.
- T =Federally listed as threatened.
- CA =California status.
- E =State listed as endangered.
- T =State listed as threatened.
- CSC =California Department of Fish and Game "Species of Special Concern".
- FP =Fully protected against take or possession pursuant t Section 4700 of the Fish and Game Code of California.
- \- =No California or Federal status.
- CNPS =California Native Plant Society Listing (does not apply to wildlife species). CNPS is private organization.
- List 1B =Plants considered by CNPS to be rare, threatened or endangered in California and elsewhere and rare throughout their range.
- List 4 =Plants of limited distribution – a CNPS watch list. Plants in this category are of limited distribution in California and their vulnerability or susceptibility to threat appears low at this time. However, they are uncommon enough that their status should be monitored regularly.

[2] CNPS status does not apply to wildlife species.

TABLE 2
PRIORITY SPECIES FOR DEL MONTE FOREST CONSERVATION
AS IDENTIFIED BY JONES & STOKES ASSOCIATES

SPECIES	COMMENTS
Plants	
Hickman's onion *Allium hickmanii*	No colonies of this species will be removed by implementation of the DMF Plan. All significant occurrences of this plant are located in designated preserve areas.
Hooker's manzanita *Arctostaphylos hookeri* ssp. *hookeri*	Only minor impacts to this species will result from implementation of the DMF Plan. Over 85% of the Hooker's manzanita in the Del Monte Forest is located in designated preserve areas.
sandmat manzanita *Arctostaphylos pumila*	No colonies of this species will be removed by implementation of the DMF Plan. All significant occurrences of this plant are located in designated preserve areas.
Monterey ceanothus *Ceanothus cuneatus* var. *rigidus*	No colonies of this species will be removed by implementation of the DMF Plan. All significant occurrences of this plant are located in designated preserve areas.
Gowen cypress *Cupressus goveniana* ssp. *goveniana*	All naturally occurring stands of the species are located in designated preserve areas and will not be affected by implementation of the DMF Plan.
Monterey cypress *Cupressus macrocarpa*	All naturally occurring stands are already in designated preserve areas and will not be affected by implementation of DMF Plan.
Eastwood's ericameria *Ericameria fasiculata*	The only known occurrence of this species in the Del Monte Forest is in the S.F.B. Morse preserve which will not be affected by implementation of the DMF Plan.
Yadon's piperia *Piperia yadoni*	Only minor impacts to this species will result from implementation of DMF Plan. Over 75% of the Yadon's piperia in the Del Monte Forest is located in designated preserve areas.
Hickman's potentilla *Potentilla hickmanii*	This species will continue to be protected and actively managed for recovery through implementation of the DMF Plan.
Pacific Grove clover *Trifolium polyodon*	No Pacific Grove clover plants will be removed and the species will be actively managed for recovery through implementation of the DMF Plan.
Monterey clover *Trifolium trichocalyx*	No known locations of this species will be affected by implementation of the DMF Plan. The species will be actively managed for recovery.
Wildlife	
black legless lizard *Anniella pulchra nigra*	This species occurs at Spanish Bay but has not been found within the DMF Plan area, It could occur in the dune preserve areas. The DMF Plan will preserve all habitat for this species.
Monterey dusky-footed woodrat *Neotoma fuscipes*	This species occurs in the Pescadero Canyon watershed area (Area PQR). The DMF Plan will preserve all habitat for this species.
Monterey ornate shrew *Sorex ornatus salarius*	No records of this species exist in the DMF Plan area but it could occur in association with riparian drainages. Potential habitat for this species will be preserved through the DMF Plan.

Source: Monterey Pine Forest Conservation Strategy Report,
JSA, 1999b.

preservation areas in the 1984 DMF LUP. Indian Village itself was set aside as a measure to protect the habitat for Hickman's potentilla (*Potentilla hickmanii*) and Pacific Grove clover (*Trifolium polyodon*). Huckleberry Hill (including the S.F.B. Morse Preserve), with its unique stands of Gowen cypress (*Cupressus goveniana*) and Bishop pine (*Pinus muricata*) and significant occurrences of other special-status species including Eastwood's ericameria (*Ericameria fasiculata*), Hooker's manzanita (*Arctostaphylos hookeri*) and Monterey clover (*Trifolium trichocalyx*), was also established early as a natural open space habitat area.[2]

In its initial planning for the ultimate build out of the forest, the Pebble Beach Company spent considerable effort mapping special-status species locations throughout the forest and developing plans that avoided impacts to the extent feasible. Nonetheless, the original proposal for the Lot Program would have resulted in significant effects to quite a few of these species. In particular, the previously proposed forest golf course in the Pescadero watershed (Area PQR) would have disrupted an otherwise relatively unfragmented block of Monterey pine forest habitat supporting the most significant occurrences of Yadon's piperia (*Piperia yadonii*), Hickman's onion (*Allium hickmanii*) and sandmat manzanita (*Arctostaphylos pumila*), as well as the only known location for the Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*), in the Del Monte Forest. In response to the assessment conducted for that project, the Pebble Beach Company revised its plans and relocated the forest course to an area already fragmented by paved roads and various surrounding uses including the equestrian center, the Pebble Beach Golf Links Driving Range, the Cypress Point and Spyglass Hill Golf Courses and developed residential areas. This revised plan (Refined Alternative 2—RA2) reduced effects on special-status species but still resulted in significant impacts on Gowen cypress, Hooker's manzanita, Yadon's piperia, Hickman's onion and sandmat manzanita according to the Final EIR prepared for the project.

To mitigate those significant effects, the County of Monterey, in cooperation with its consultants, the Department of Fish and Game, and the Pebble Beach Company, prepared an Ecological Management Plan (EMP) and Ecological Management Implementation Plan (EMIP) for the Del Monte Forest (EIP Associates 1997 & Ecosynthesis Scientific and Regulatory Services 1999). The EMP and the EMIP constituted a comprehensive multi-species approach for the preservation and propagation of the Monterey pine forest habitat in the Del Monte Forest with an emphasis on special-status species preservation and long-term sustainability. The EMP and EMIP provided both habitat and species-specific management and monitoring prescriptions that allowed for long-term conservation in the context of forest build out as proposed by that project.

The development of the DMF (Measure A) Plan was based on the goal of improving and maintaining ecosystem health in the Monterey pine forest on the Monterey Peninsula beyond that proposed by the RA2 project. Habitat preserve areas were established by eliminating those areas as candidates for any future development based largely on the occurrence of suitable habitat for

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[2] The Huckleberry Hill Natural Habitat Area (NHA) was established in part as "premitigation" for the ultimate build out of the Del Monte Forest in accordance with the LUP. The allowable uses and densities under the LUP would have resulted in far greater impacts to Monterey pine forest habitat than the current DMF Plan. Maintaining and enhancing the Huckleberry Hill NHA as an open space preserve in perpetuity remains a critical component of the DMF Plan.

special-status species, including the Monterey pine (*Pinus radiata*) itself. Under the DMF Plan, all impacts to special-status species that accompanied previous forest build out proposals are

either eliminated or significantly reduced. Large areas, such as Areas G (±48 acres), Area H (±54 acres) and Area I-1 (±42 acres), previously proposed for residential development, are now dedicated natural open space with resulting elimination of direct impacts on the species that occur in those areas. Area L, adjacent to the sensitive species habitat at Indian Village, has also been established as a natural open space preserve, thus eliminating the threat of indirect effects (e.g. drainage modifications) that might compromise the long-term recovery of Hickman's potentilla and Pacific Grove clover in that area. A directed forest management plan that tiers off of the previous EMP remains a component of the DMF Plan. Species-specific and habitat-specific management measures are important parts of the forest management plan. The only residual impacts to special-status species that remain are those to Yadon's piperia, Hooker's manzanita and Monterey pine itself. Management measures designed to reduce impacts to the first two species and assure the long-term sustainability of all special-status species in the forest are further discussed below. Measures to reduce residual impacts to Monterey pine and the Monterey pine forest are discussed in the Forest Assessment and Management Report prepared under separate cover.

2.3 Special-Status Species as ESHA

One of the goals of the Del Monte Forest Land Use Plan (LUP) is to recognize and accommodate rare and endemic biotic resources. As such, the LUP identifies certain Environmentally Sensitive Habitat Areas (ESHAs) and affords protections through specific policies to all designated ESHAs. The LUP defines ESHAs as follows:

> *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.*

The LUP lists "the rare Monterey cypress and the endangered Gowen cypress forest communities, the endemic Monterey pine/Bishop pine association, remnants of the indigenous coastal sand dunes…" and other resources as examples of habitats "which have been determined to be *entirely or in part* environmentally sensitive…(emphasis added)." The LUP goes on to state that a complete listing of those examples is provided in LUP Appendix A. The Appendix A List includes specific rare, threatened and endangered species and their habitats and other sensitive species and their habitats that were determined to be especially valuable due to their special role in an ecosystem. However, Appendix A is not a comprehensive list of all special-status species that occur in the Del Monte Forest (many of which were considered sensitive at the time). For example, Hickman's onion, Hooker's manzanita, sand gilia, Tidestrom's lupine and beach layia do not appear on the Appendix A list. The Appendix A List also includes some locations (e.g. significant occurrences only) of some species and not other locations of the same species.

Monterey County, in its review of the Lot Program EIR mentioned previously, determined that the DMF LUP Appendix A list, as an attachment to a general plan level document, was a complete listing of ESHAs in the Del Monte Forest for planning purposes. Nonetheless, the

County considered impacts and mitigation measures to sensitive coastal resources through its review of the Lot Program EIR whether they were included on the Appendix A designated ESHA list or not. The County determined that, with the implementation of appropriate mitigation, including a comprehensive ecological management program (EMP), the previously proposed Lot Program was consistent with the provisions and policies of the DMF LUP governing development in and near designated ESHAs.

Coastal Commission staff, however, have disagreed with this treatment because they believe it does not adequately apply the ESHA definition and thereby protect a number of rare and sensitive species and habitats through application of LCP policies governing ESHAs (Grove 1999). Specifically, Coastal Commission staff have suggested that listed and other special-status species of all description, including Monterey pine and Monterey pine forest, could constitute ESHA. However, they have conceded that "rather than categorically describing all Monterey pine forest as ESHA, some Monterey pine habitat areas may meet the ESHA criteria while others may not" (Grove 1999).

Clearly the intent of the LUP is not to restrict all uses within the Del Monte Forest on the basis that some disruption to a relatively widespread special-status species such as Monterey pine, Hooker's manzanita or Yadon's piperia might occur. Rather the concepts of "significant disruption" and "significant occurrences" were developed to allow flexibility of judgement in the interpretation of LUP policies. Similarly, while the Appendix A list may not have been intended as a static list frozen in time without the benefit of periodic professional review and update, neither was it drafted in anticipation of frequent modification because the taxonomic or listing status of a species was revised by some organizations. As planning tools, the Appendix A list and the ESHA designation, as they apply to special-status species, should provide conservation guidance and a cautionary note for certain proposed uses in certain areas.

Obviously the rarer (i.e. limited in distribution within the forest) species are, the more localized the conservation effort needs to be. Thus, all of the remaining naturally occurring dune substrates supporting special-status dune species should be priority candidates for permanent preservation and would qualify as ESHA. Similarly, all known areas of Monterey clover, extensive stands of Gowen's cypress, Monterey cypress and the areas of Bishop pine/Monterey pine associations are appropriately so designated. Conversely, species that are widespread in the forest should not automatically be classified and protected as ESHA solely on the basis of a special listing status. Assuming an adequate representation of such species were included in an overall conservation and management program, some loss is acceptable as long as substantial and representative populations that conserve the species and their genetic diversity are placed in permanent protection.

The DMF Plan creates a conservation program intended to conserve a full range of species and genetic diversity, maintain a viable, self-sustaining ecosystem and improve and maintain ecosystem health. The DMF Plan establishes both the land area and the means (through reasonable economic return) to realize this conservation program. Over 700 acres of Del Monte Forest lands with a diversity of habitat subtypes and sensitive species will be set aside and managed as permanent open space under this plan. Land areas will be large and contiguous so that both natural processes and active management can occur. As with the Lot Program, the

DMF Plan was developed through consideration of impacts and mitigation measures to sensitive coastal resources whether they were included on the Appendix A designated ESHA list or not. Unlike the Lot Program, the DMF Plan has reduced those impacts by precluding any further residential development on Pebble Beach Company property in the Del Monte Forest. Determining the consistency of the Del Monte Forest Plan with the DMF LUP provisions and policies for the long-term preservation of the forests special-status species, whether or not they are designated ESHA, should not be difficult.

3.0 SPECIAL-STATUS PLANT SPECIES

As noted previously, extensive botanical surveys conducted in the forest over time have resulted in the observation of several species of special-status plants typically associated with closed cone coniferous forest and coastal dune and coastal terrace habitats. To update the record, comprehensive, seasonally-timed surveys of the entire Del Monte Forest were conducted throughout the spring and summer of 2001 by Mr. Vern Yadon. The results of Mr. Yadon's surveys are included in Appendix A.

Most of the special-status coastal dune species are restricted to dune habitats that are only marginally part of the Monterey pine forest (Monterey pine on young stabilized dunes subtype). Of the other species, some, such as Pacific Grove clover, Monterey clover and Hickman's potentilla, are limited in their distribution in the forest as discussed below. Other special-status plants such as Hickman's onion, Hooker's manzanita and Yadon's piperia occur in various locations throughout the forest as also discussed below. Brief descriptions including regulatory status, summary ecological and range information and DMF locations for each of the special-status plant species observed in the Del Monte Forest follow.

3.1 Hickman's Onion

Hickman's onion (*Allium hickmanii*), a CNPS List 1B species, is a small perennial herb that forms an underground bulb. It typically grows in small clearings within the forest where relatively shallow soil conditions, adequate moisture and competing vegetation permit.

This plant is of limited distribution, with small populations centered on the Monterey Peninsula, near Jolon in Monterey County, and in San Luis Obispo County. A relatively large (394 acres) occurrence has been reported at former Fort Ord, all of which will be preserved as base reuse proceeds. Approximately 9.5 acres of Hickman's onion is located on the east side of Hatton Canyon. Hickman's onion also occurs in the Carmel Valley. There are a few, relatively small groupings of Hickman's onion in the Del Monte Forest, including the approximate 5.8-acre occurrence at PQR and other smaller occurrences in Areas F-3, H, I-1 and V (See attached Plates). All observed populations of Hickman's onion have been preserved and protected in designated open space preserve areas or within appropriate setbacks by the DMF Plan. No plants will be removed by the DMF Plan.

3.2 Hooker's Manzanita

Hooker's manzanita (*Arctostaphylos hookeri*), a CNPS List 1B species, is a low-growing woody shrub (up to three feet high) that forms conspicuous mounds on sandy soils within the Monterey Pine Forest habitat. It is a common component of central coast maritime chaparral and closed-cone coniferous communities of the Monterey Bay region. The range of the species extends from southern Santa Cruz County south to Monterey County with the bulk of its population located at former Fort Ord. Approximately 5,217 acres (1,418 low, 2,506 medium, and 1,293 high density) of Hooker's manzanita occurs at former Ford Ord. Hooker's manzanita is found throughout the Del Monte Forest, and is found in Areas F-1, F-2, F-3, G, H, I-1, I-2, N, V and PQR covering a total of about 179 acres in densities ranging from low to high. A substantial population of Hooker's manzanita (the most abundant occurrence of the species within the DMF) is found in the Huckleberry Hill Natural Habitat Area which will preserved in perpetuity as natural open space.

3.3 Sandmat Manzanita

Sandmat manzanita (*Arctostaphylos pumila*), a CNPS List 1B species, is a spreading shrub that occurs primarily in central coast maritime chaparral and coastal scrub habitats with outliers in the closed-cone coniferous forests of the Monterey Peninsula. The species is located in Monterey County, with the population centered at Fort Ord. The plants found in the Del Monte Forest account for less than one percent of the total species population. Small occurrences are found in Areas I-1 and PQR. The southern location in Area PQR is the largest in the Del Monte Forest. This location constitutes a significant occurrence and is therefore designated ESHA under the LUP's definition. The area will be preserved and managed as permanent natural open space under the DMF Plan.

3.4 Monterey Ceanothus

Monterey ceanothus (*Ceanothus cuneatus*), a CNPS List 4 species, is a shrubby member of the buckthorn family with conspicuous blue blossoms in the early spring. It is often among one of the first woody colonizers after a fire and can be found in sandy hills and flats of maritime chaparral, closed-cone coniferous forests and coastal scrub. The species occurs in coastal areas of Monterey County from Prunedale through the Monterey Peninsula. The most abundant and probably most vigorous population of Monterey ceanothus is found on former Fort Ord. In the Del Monte Forest, the species is centered primarily in the Huckleberry Hill Natural Habitat Area. Monterey ceanothus is not considered rare, threatened or endangered by state or federal resource agencies or the CNPS, but the DMF LUP designates significant occurrences of the plant in the Del Monte Forest as ESHA. All significant occurrences of this species in the Del Monte Forest will be preserved as permanent natural open space.

3.5 Gowen Cypress

Gowen cypress (*Cupressus goveniana*) is listed as threatened by the U.S. Fish and Wildlife Service and also included on the CNPS 1B List. It is one of several members of the cypress family consisting of limited range tree species scattered in isolated populations throughout

California and elsewhere. This species is limited to a few highly restricted populations endemic to Monterey County. In the Del Monte Forest, it occurs primarily within the S.F.B. Morse Botanical Reserve and the Huckleberry Hill Natural Habitat Area. Isolated Gowen cypress also occurs in Areas F-1, F-2 and F-3. Gowen cypress trees that were planted as part of the quarry reclamation project also occur in the upper and lower sawmill quarry. Gowen cypress has also been introduced to other areas of the forest as a landscape element. All naturally occurring stands of Gowen cypress will be preserved through implementation of the DMF Plan.

3.6 Monterey Cypress

Monterey cypress (*Cupressus macrocarpa*), a CNPS List 1B species, is another one of several members of the cypress family consisting of limited range tree species scattered in isolated populations throughout California and elsewhere. This species is also limited to a few highly restricted populations endemic to Monterey County, notably at Cypress Point along the 17-Mile Drive. However, Monterey cypress is perhaps the most widely planted ornamental cypress in the world and has also been introduced to other areas of the forest as a landscape element. The only possibly naturally occurring native stands of Monterey cypress in the DMF Plan area occur on the Signal Hill Dune. This area will be preserved and permanently managed as natural open space through implementation of the DMF Plan.

3.7 Eastwood's Goldenfleece

Eastwood's goldenfleece (*Ericameria fasiculata*) , a CNPS List 1B species, is a woody member of the sunflower family that occurs in coastal dune and scrub, chaparral and closed-cone coniferous forest communities in Monterey County. Its range stretches from Prunedale to the Monterey Peninsula with the most abundant population found in the chaparral habitats on former Fort Ord. The only record for the species in the Del Monte Forest is from the Huckleberry Hill Natural Habitat Area (Yadon 2001). The DMF LUP designates this species' habitat in the Del Monte Forest as ESHA. All habitat for this species in the Del Monte Forest will be preserved as permanent natural open space.

3.8 Monterey Pine

Monterey pine (*Pinus radiata*), a CNPS List 1B species, is the dominant species in the Monterey pine forest habitat that occurs throughout the DMF. While this species is widely planted as an ornamental and commercial forest tree, the California Natural Diversity Data Base (CNDDB) lists only 11 extant natural occurrences of the Monterey pine forest habitat. The threats to the Monterey pine as a species are limited as the species is widely planted and survives over much of the world. The potential threat is to the specific genetic material presented by the tree on the Monterey Peninsula and the Monterey pine forest habitat within the tree's natural range on the Monterey Peninsula. These forests represent habitat which holds native genetic material of the Monterey pine. The threats to these forests include urbanization, fire suppression, and contamination of the gene pool through the introduction of non-native Monterey pine. In addition, pitch canker fungus may pose a threat to the tree on the Monterey Peninsula, thereby posing a potential threat to its habitat. Measures to insure the long-term sustainability of Monterey pine and the Monterey pine forest habitat on the Monterey Peninsula are intrinsic

components of the Del Monte Forest Plan. See the Monterey Pine Forest Report prepared under separate cover for details.

3.9 Yadon's Piperia

Yadon's piperia (*Piperia yadonii*), a federally endangered and CNPS List 1B species, is a relatively inconspicuous terrestrial orchid that produces strap-shaped basal leaves in the early spring and spike-like bloom stalks in the mid to late summer months. The plant is dormant from about September through January. Yadon's piperia was taxonomically segregated from the widespread Alaskan orchid (*Habenaria unalascensis*) in the early 1990's and was listed as endangered by the USFWS in 1996. Prior to the mid-1990's, this orchid was believed to be of limited occurrence within a small range on the Monterey Peninsula.

Prior to 1993, it was only known in the Del Monte Forest from a population somewhere near the center of Area PQR. A small population of five flowering plants was discovered in 1993 along a trail north of Seal Rock Creek in Area I-1. Yadon's piperia was not detected during earlier surveys perhaps because flowering was suppressed due to six years of drought. The potential effects of the drought led to the hypothesis that the plant may be more widespread within the DMF than previously believed. Additional study determined that the plant could be distinguished accurately by unique leaf characteristics. These circumstances (end of drought and ability to identify plant from leaves) indicated that further surveys were warranted. Accordingly, intensive surveys for leaves of Yadon's piperia were conducted by Pebble Beach Company consultants and EIP Associates botanists in 1995 and 1996 throughout the Monterey Peninsula. As predicted, they found Yadon's piperia to be much more extensive than previously believed.

Intensive surveys found dense groupings of this species throughout the Del Monte Forest especially in Huckleberry Hill, Area PQR and in areas adjacent to Stevenson Drive, Drake Road and Forest Lake Road. Similar dense concentrations were found at the Old Capitol site in the City of Monterey. A total of 45,721 plants (identified by basal leaves) were found in the development areas (largest concentration in Area PQR with 16,000 plants). Reconnaissance level surveys also detected populations of Yadon's piperia at Skyline Forest Drive, Veteran's Park, Point Lobos, Riley Ranch (east of Highway 1 near Point Lobos), Manzanita Park and vicinities to the east, and ridgetops north of Long Valley. These surveys found Yadon's piperia predominantly in the herbaceous understory subtype of the Monterey pine forest where conditions of shade, well-drained soils with moderate moisture retention abilities in the rainy season were present. Where conditions are too moist, it is displaced by Pacific reed grass. It also occurs inland with chaparral between or under the perimeter of shrubs on shallow soils. It does not occur where a Monterey pine canopy and shrubby understory co-exist. It has been observed colonizing disturbed sites such as old road cuts.

The apparent abundance of Yadon's piperia on the Del Monte Forest (over 55,000 plants) compared with the apparently limited occurrence elsewhere could be misleading. The surveys which detected the widespread and dense Del Monte occurrences were conducted by looking for leaves, but surveys in other areas were based on flowers. Recent studies conducted by locating a group of leaves, in a given plot, counting the number of plants, then returning to count flower stalks, caging to protect them from grazing animals, then returning to count flower stalks

determined that only about two percent of the plants produced observable flowers. When specimens were caged to protect them from grazing by wildlife, approximately 80 percent of the caged plants flowered It should be noted that caged specimens were selected with the expectation that they were likely to flower if protected. Still, the results demonstrate the substantial effect from herbivores on successful flower production and subsequent seed formation. Grazing by wildlife could even further reduce flower occurrence in an unprotected stand. Another factor which could lead to erroneous conclusions is that the surveys conducted in the DMF area were very intensive, using as many as 12 people to cover as much surface area as possible. It is likely that intensive surveys for leaves of Yadon's piperia throughout its range (from the Pajaro Hills south to Carmel Highlands) would find it to be much more abundant and widespread than previously believed.

3.10 Hickman's Potentilla

Hickman's potentilla (*Potentilla hickmanii*), a federal and state endangered and CNPS 1B species, is a small perennial herb in the rose family that dies back in the winter to a woody taproot. It was known historically from only three locations: 1) where originally collected in 1900 "near the reservoir which supplies Pacific Grove, along the road to Cypress Point" (Forest Lake or Pacific Grove Reservoir), 2) Moss Beach near Half Moon Bay in San Mateo County, and 3) in a meadow opening within Monterey pine forest at Indian Village in the Del Monte Forest (near Area L). It is believed to be extinct at the Pacific Grove reservoir site, and is only known to exist at the Indian Village location and at a second location in the hills above Martini Creek, in the Devil's Slide area of San Mateo County. Population numbers at the San Mateo location were approximately 2,000 in 1996 and 2,600 in 1995. The Indian Village population has fallen to as low as 14 individuals and presently consists of fewer than 40 plants (Doak, et. al. 2001). Most of these are growing in a small exclosure constructed for their protection by the Pebble Beach Company. However, some plants are located outside of the exclosure. The exclosure area and its surroundings were formerly a horseshoe pit and it is not clear whether the trampling and other disturbance may have had some benefits for the species (Doak, et. al. op. cit.). Ownership of the land at Indian Village has been transferred to the Del Monte Forest Foundation. CDFG recently sponsored an investigation into the ecological factors affecting recovery of Hickman's potentilla and the USFWS is currently preparing a recovery plan for this species.

3.11 Pacific Grove Clover

Pacific Grove clover (recognized locally in Monterey County as *Trifolium polyodon*), a state listed rare and CNPS 1B species, is a plant of uncertain taxonomic position, possibly of hybrid origin. It has been treated in the most recent update of the California flora (Jepson Manual) as a phase of *T. variegatum*, the most common and widespread native clover species in California. Pacific Grove clover is an annual herb limited to a few populations in Monterey County. Known locations for this plant include Point Lobos, Spanish Bay, Seventeen Mile Drive, Indian Village, Pebble Beach Equestrian Center, and an inland site near Highway 68. The habitat occupied by this species is typically without overstory and with shallow soils that are subject to saturation in the rainy season and desiccation during the summer. Pacific Grove clover is tolerant of (and may even benefit from) vegetation and soil disturbance (JSA 1996a). It has been found in

pastures, trails, horse training areas, parking areas, picnic grounds, abandoned roads, and under grandstands where it is regularly subject to disturbance regimes including horse and pedestrian trampling, vehicle traffic and parking, mowing, and horse and cattle grazing. Vegetation disturbance from trampling may be of benefit through the reduction of competitive cover. The heavy ground disturbance (e.g. regular active equestrian use, trampling and soil compaction) at the existing Pebble Beach Equestrian Center has not kept the clover from occurring there year after year (albeit in varied locations). According to Jones and Stokes Associates (JSA op.cit.), "much of the clover habitat at the equestrian center may be of artificial origin and artificially maintained by heavy disturbance….This site could be used for experimental studies of the relationship between the clover and various vegetation and ground disturbance levels …. infrequently used or unused areas at the equestrian center could be set aside for Pacific Grove clover protection."

3.12 Monterey Clover

Monterey clover (*Trifolium trichocalyx*) is listed as federally and state endangered and is also a CNPS 1B species. Monterey clover was observed in large numbers on the extreme northern portion of Area G, which is an area that was burned in the 1987 Pebble Beach fire. It has now disappeared under a dense growth of regenerating chaparral and Monterey pine saplings. This fire-adapted species occurs only in a few restricted populations in California.

The occurrence of Monterey clover located in Huckleberry Hill Natural Habitat Area, downslope and across the drainage paralleling the "panhandle" of Area G appears to be unique in the Del Monte Forest. This particularly healthy condition suggests that fire plays a role in the distribution of Monterey clover, but the nature of the dependency upon fire (reduction of competition, stimulation of germination, or alteration of soil nutrient levels or other characteristics) is not yet clearly established. All areas known to have supported this species will be preserved by the DMF Plan.

3.13 Coastal Dune Habitat Species

Monterey Indian paint brush, Monterey spineflower (*Chorizanthe pungens* var. *pungens*), Menzies' wallflower, beach layia (*Layia carnosa*), sand gilia (*Gilia tenuiflora* var. *arenaria*) and Tidestrom's lupine (see Table 1 for regulatory standing of each) have all been observed in the dune habitats associated with Signal Hill and Indian Village. All of these sensitive endemic dune species depend on seed for their reproduction and continued survival. These species rely on specific conditions and do not tolerate a high degree of human use, although, with adequate controls to limit access, human use is not incompatible. The DMF Plan will set aside all occupied habitat for these species as permanent open space and provide appropriate management to assure the long-term sustainability of these species and the dune habitat overall. See the Coastal Dune Report prepared under separate cover for details.

3.14 Other Species

Other plant species considered by various reviewers over time have not been included in this discussion because they do not fit the criteria for special-status as defined herein. Examples of

such species would include CNPS List 4 ("watch list") species known to occur in the forest such as small-leaved lomatium (*Lomatium parvifolium*), adder's tongue fern (*Ophioglossum californicum*) or Gairdner's yampah (*Perideridia gairdnerii*). Relatively common species with no listing status that have been considered special by virtue of their associations in the forest, such as Bishop pine or coast buckwheat (*Eriogonum parvifolium*), have also been omitted in this review. These and other species are considered important to the overall health and vigor of the Monterey pine forest ecosystem. All of them are well-represented in the preserve areas established by the DMF Plan (see Appendix A). For example, the Bishop pine/Gowen cypress association occurs in the Huckleberry Hill preserve area, adder's tongue fern has been recorded from the moist meadow in Area PQR and Gairdner's yampah was found in Area's PQR and H as well as Indian Village and the S.F.B. Morse Reserve. All of these locations will be managed as natural open space in perpetuity with management criteria directed toward preserving these species and their habitat.

4.0 SPECIAL-STATUS WILDLIFE SPECIES

Several special-status animal species including the black legless lizard (*Anniella pulchra nigra*), the coast-horned lizard (*Phrynosoma coronatum frontale*), the Monterey dusky footed woodrat (*Neotoma fuscipes luciana*), the pallid bat (*Antrozous pallidus*), the sharp-shinned hawk (*Accipiter striatus*), the ringtail (*Bassariscus astutus*) and the Monterey ornate shrew (*Sorex ornatus salarius*) have been observed in the Del Monte Forest area over time or are expected to occur in habitats associated with Monterey pine forest. In addition, various other raptor species, which are not considered special-status species *per se*, but are afforded certain protections during their nesting seasons, have been observed in the forest. Some special-status wildlife species with potential to occur in the forest or on the Monterey Peninsula have been eliminated from further consideration because of unsuitable habitat and range characteristics or as a result of directed searches. A brief summary of the regulatory standing, biology and forestwide distribution of the special-status wildlife species known or suspected to occur in the Del Monte Forest Plan area is presented in Section 4.1. Section 4.2 presents a summary of the key species eliminated from further consideration and the rationale for eliminating them.

4.1 Special-Status Wildlife Species Known or Expected to Occur in the DMF

4.1.1 Black Legless Lizard

The black legless lizard (*Anniella pulchra nigra*) was last proposed for federal listing as endangered in 1997 but was withdrawn as a federal candidate based on new information regarding its range and distribution. It remains a California species of special concern. It is typically found in dune habitats supporting bush lupine and mock heather. It requires friable (easily crumbled or pulverized) soils with relatively open or incomplete plant cover. Thus, dunes dominated by cover of invasive non-native species, especially ice plant mats, have reduced habitat values for legless lizard.

Black legless lizards have been found in the dune habitats at Spanish Bay; remnant dunes in Areas M, N & L provide potential habitat for this species and its near relative, the silvery legless

lizard. The potential for the species to occur in the disturbed areas around Spyglass Pit is low due to isolation from other dune systems, past disturbances, a relatively low degree of litter development, and the domination by non-native vegetation (principally ice plant mats) in much of the area. Random hand surveys in the duff layer of native dune shrubs during the late spring of 1994 and systematic raking surveys conducted in May 1995 revealed no evidence of legless lizards in the areas of remnant sands adjacent to Spyglass Pit. Areas of native dominated dune scrub associated with the Spyglass Hill and Indian Village remnant dunes are more likely to support occurrences of these animals. All such areas will be preserved and managed as natural open space with implementation of the DMF Plan.

4.1.2 Coast Horned Lizard

The coast horned lizard (*Phrynosoma coronatum frontale*), a California species of special concern, requires friable soils for cover and insects (primarily ants and beetles) for food. This species typically is found in open, usually sandy areas between shrubs in dunes, coastal scrub and chaparral habitats near a reliable food source. The majority of Monterey Pine Forest habitat in the Del Monte Forest Plan area is mostly closed canopy with very few open areas and, therefore, provides marginal habitat for this species. However, the chaparral habitats in the Huckleberry Hill area and the upper areas of remnant dune at Signal Hill and the entrance to Indian Village provide potentially suitable habitat for this species. All of these areas will be preserved as natural open space under the DMF Plan.

4.1.3 Monterey Dusky-Footed Woodrat

The Monterey dusky-footed woodrat (*Neotoma fuscipes luciana*), a California species of special concern, is endemic to the Monterey Peninsula. It is one of eleven subspecies of woodrat which occur generally in evergreen oak woodland habitats from Oregon to Baja California. It prefers forest habitats with moderate canopy and a relatively dense brushy understory with suitable nest building materials. Some forest habitats in the Del Monte Forest Plan area, especially in ravines, provide suitable habitat for this species. Systematic surveys were conducted for the Monterey dusky-footed woodrat throughout the forest in July 1994. No evidence of woodrats was found except on a portion of Area PQR in a dense, poison-oak dominated drainage ravine that is tributary to Pescadero Creek (see Plates). A small population comprised of six active nests or stick houses was identified in this area. The extent of the population in this drainage could not be determined in July due to the density of poison oak along much of the drainage course. However, several return visits during the winter of 1995, when much of the shrubby and herbaceous understory was leafless, confirmed the absence of additional woodrat nests beyond those previously observed. Subsequent return visits to the area have confirmed the persistence of this colony of woodrats over time. The area will be preserved as part of the DMF Plan.

4.1.4 Pallid Bat

The pallid bat (*Antrozous pallidus*), a California species of special concern, is associated with oak woodlands in coastal California. It is expected in habitats with an abundance of mature oak trees because it uses tree cavities for daytime roosting areas. Habitat and acoustic surveys were conducted by specialists for bats on August 4, 1994 and September 7 and 8, 1994, respectively.

The habitat survey, focusing on the presence of large diameter trees with cavities or other potential roosting areas, found conditions for tree-roosting bats to be suitable in many areas throughout the forest (Areas G, H, B, C, N,O,U, K, L, M, and PQR). Acoustic surveys showed high levels of bat activity in most of those areas (Areas G,H, I-1, B, C and PQR). Acoustic analysis of bat calls identified most of the calls as being those of common forest dwellers. However, five sequences within the frequency range and not distinguishable from the pallid bat were noted, primarily in Areas B, C, K, L, and PQR near mature oaks and/or streamcourses. As this frequency range is shared by the common brown bat, the surveys do not confirm the presence of the pallid bat, however, it was judged possible that the latter species occurs within the DMF Plan area.

4.1.5 Ringtail

The ringtail (*Bassariscus astutus*), a fully protected species under the California Fish and Game Code, is a widely distributed relative of the raccoon that inhabits a variety of riparian habitats. The riparian and forest habitats within the DMF Plan area could support this species, although there are no records of the animal in the forest. The preservation and protection of all riparian habitat within open space preservation areas along with directed ecological management of the forest should result in a minimal effect, if any, on the ringtail.

4.1.6 Monterey Ornate Shrew

The Monterey ornate shrew (*Sorex ornatus salarius*), a California species of special concern, is an endemic subspecies of shrew that occurs on the Monterey Peninsula. This insectivore prefers riparian habitats and other moist microclimates. The riparian and forest habitats within the DMF Plan area could support this species, although there are no records of the animal in the forest. The preservation and protection of all riparian habitat within open space preservation areas along with directed ecological management of the forest should result in a minimal effect, if any, on this species should it occur.

4.1.7 Raptors and Owls

The sharp-shinned hawk (*Accipiter striatus*), a California species of special concern, is a forest and woodland species that was observed nesting in dense Monterey pine forest canopy adjacent to Area B in 1993. Return surveys in 2001 did not locate a nest site or breeding evidence for this species in the forest (Tenney 2001—See Appendix B). Nonetheless, both the sharp-shinned hawk and another special-status raptor, the Cooper's hawk (*Accipiter cooperi*), have the potential to occur in the habitats within the forest. Other more common raptor species, such as the American kestrel (*Falco sparverius*), red-tailed hawk and red-shouldered hawk (*Buteo jamaicensis* and *B. lineatus*), have been observed in the forest and may also utilize the forest habitat for nesting. However, these species typically forage in more open country. Several species of common owls such as the great horned owl (*Bubo virginianus*), western screech owl (*Otus kenicottii*), and barn owl (*Tyto alba*) may also utilize the forest habitat in the Plan area for all or part of their life cycle. However, great-horned owls are probably the only breeding owls in the Del Monte Forest (Tenney 2001). Both great-horned owl nests recorded during the 2001

avian survey work occur in preserve areas, one in Huckleberry Hill and the other in Pescadero Canyon (see Appendix B).

4.2 Key Special-Status Wildlife Eliminated from Further Consideration

4.2.1 Smith's Blue Butterfly

The Smith's blue butterfly (*Euphilotes enoptes smithi*), a federally listed endangered species, utilizes several species of buckwheat (*Eriogonum* spp.) that occur in sand dune habitats for both larval and adult food plants. This butterfly has not been recorded in the Pebble Beach area; there are gaps in its distribution between the City of Monterey shoreline and the Carmel Valley area. Although apparently suitable habitat and host plants for this species occurs in the vicinity of Areas M, N and L, no butterflies have been recorded and none were observed in these areas or anywhere along the entire 17-Mile Drive during regular, seasonally-timed surveys of the conducted during the summer of 2000 (Arnold 2000—Appendix C). In any case, the remnant dunes in these areas would be protected and preserved in permanent open space; therefore, potentially suitable habitat for the Smith's blue butterfly lies outside the project impact area.

4.2.2 Monarch Butterfly

The monarch butterfly (*Danaus plexippus*), although not technically considered a special-status species, is a species of local interest which has been included in past assessments of the Del Monte Forest. It is one of the few North American insects known to migrate long distances during its life cycle. Migratory and/or overwintering aggregations have been observed from Marin County south to Baja California; aggregations often occur regularly at the same sites, but may be absent for several successive years before returning again in great numbers. Suitable temporary or winter-long roost sites occur in dense groves of blue gum (eucalyptus), pine, and cypress within a mile or two (maximum) of the ocean, ideally where the topography is conducive to the pooling of cool air. In addition to protection from temperature extremes and dry air, overwintering monarchs require sources of water and (floral) nectar. Suitable roost sites are therefore widely scattered along the coast; many are subject to development or other adverse impacts.

No monarch butterfly aggregation sites have been recorded from the DMF Plan area, although suitably dense forest cover and topography near drainages occurs in Areas H, I-1, and PQR. All areas were surveyed on one or more dates in December 1993 and January 1994 (Murphy 1994). Area PQR was judged to offer the most suitable butterfly habitat and was therefore surveyed repeatedly; although individual butterflies were observed, no aggregations were observed in any of the DMF Plan areas.

4.2.3 California Red-Legged Frog

The California red-legged frog (*Rana aurora draytonii*), a federally-listed threatened species and a California species of special concern, is a highly aquatic species that frequents slow moving perennial creeks and adjacent uplands for reproduction, cover, and movement. No such habitat occurs in the Del Monte Forest Plan area. At best, the drainages within the DMF Plan areas

support only marginal habitat for this species because of their intermittent hydrology. The drainages in areas I-1, H and PQR will be set aside as permanent open space as part of the DMF Plan. Protocol-level surveys for red-legged frogs in areas proposed for development as part of the DMF Plan were conducted over a period of two years and no red-legged frogs were observed in those areas (Froke 2000—See Appendix D).

4.2.4 California Tiger Salamander

The California tiger salamander (*Ambystoma californiense*), a federal candidate for listing and a California species of special concern, inhabits open grassland or oak savannah with small mammal burrows, in close proximity to potential breeding habitat in temporary ponds (typically vernal pools). Critical to this species' aquatic habitat is the absence of predators, such as fish and large predatory insects, that occur in permanent or semi-permanent water bodies. No suitable combination of habitat occurs in the project area. This conclusion is substantiated by records of the CNDDB and Pacific Grove Natural History Museum, which report no collections or sightings of this animal in or near the Del Monte Forest (Yadon, pers. com.). The closest known occurrence is on Fort Ord (one mile west of Laguna Seca Raceway), where suitable habitat combinations do occur. It is therefore highly unlikely that this species occurs in the DMF Plan area.

4.2.5 Western Snowy Plover

The western snowy plover (*Charadrius alexandrinus nivosus*), a federally-listed threatened species and a California species of special concern, inhabits sandy marine and estuarine shores along the coast of California. It is known to nest in the sand dunes along the Monterey coast and, as a ground nester, is very susceptible to disturbance. There are no records of nesting western snowy plover along the shoreline areas of the Del Monte Forest. Situated as they are some distance from the water, the dune habitats within the Del Monte Forest Plan area do not even provide suitable potential nesting sites for this plover. Critical habitat and other USFWS maps of the habitat of the snowy plover confirm that the DMF Plan area lies outside the nesting range of the species.

4.2.6 Burrowing Owl/Short-eared Owl

Both the burrowing owl and the short-eared owl are California species of special concern. The short-eared owl occurs throughout the United States in open country almost exclusively, typically grasslands and marshes. It nests and roosts on the ground in dense cover, either in tall herbaceous vegetation or in semi-pen thickets (for example, of willows). Such roosting areas must be located adjacent to suitable, extensive grassland or wetland foraging habitat. The burrowing owl also requires extensive open grassland habitat for foraging and roosting. Neither suitable foraging habitat nor particularly suitable roosting areas occur within the DMF Plan area for either species.

4.2.7 Other Bird Species

The CNDDB, CDFG, and other sources indicate that six species of special-status birds-of-prey (raptors) may utilize habitats such as those of DMF Plan area for all or some of their life cycle.

Four raptor species that may occur in the DMF Plan area depend significantly on habitat elements that are not present in the Plan area (golden eagle, northern harrier, prairie falcon, peregrine falcon). Therefore, further discussion of these species is not warranted. Also, other bird species including the black swift (*Cypseloides niger*), yellow warbler (*Dendroica petechia brewsteri*), and California horned lark (*Eremophila alpestris actia*) all require habitat elements not found within the Del Monte Forest Plan area.

5.0 SPECIAL-STATUS SPECIES OCCURRENCES IN RELATIONSHIP TO DMF PLAN

5.1 Preserve Areas

5.1.1 Special-Status Wildlife Species

The large blocks of Monterey pine forest within the preserve areas to be established by the Del Monte Forest Plan, especially the Huckleberry Hill Natural Habitat Area (NHA), the Pescadero Canyon (Area PQR) area and the former subdivisions (Areas G, H, I-1) adjacent to them, will create large, contiguous habitat areas for the long-term sustainability of most of the special-status animals with potential to occur in the forest. For example, these habitat areas, under an appropriate management regime (see below), will provide viable nesting, roosting, resting and foraging opportunities for a variety of bird, bat, owl and raptor species, the ringtail, the Monterey dusky-footed woodrat and the Monterey ornate shrew along with more common forest wildlife. The key to the preservation of these "generalist" forest inhabitants is meaningful habitat preservation and management, which will be accomplished by setting aside and ecologically managing over 700 acres of Monterey pine forest habitat in perpetuity as provided in the DMF Plan.

More specific area or niche-dependent wildlife species such as those associated with sand dune habitats or aquatic systems will also be afforded habitat protection by the DMF Plan. The remnant dune habitats with potential to support black legless lizards and coast horned lizards located in areas M, N & L will be avoided and restored in conformance with the dune conservation, enhancement and restoration program discussed elsewhere (see Coastal Dunes Report prepared under separate cover). While they do not technically constitute aquatic systems, seasonal wetlands and riparian drainage courses that could potentially provide retreat habitat and movement corridors for red-legged frogs and Monterey ornate shrew occur in Huckleberry Hill, Pescadero Canyon (Area PQR), Areas, G, H and I-1. In addition, the watershed adjacent to the downstream reaches of Seal Rock Creek in the vicinity of Indian Village (Area L), perhaps the one truly natural aquatic system potentially influenced by the DMF Plan, will also be set aside as a preserve area, thus further protecting the integrity of this system and its associated wildlife.

5.1.2 Special-Status Plants

Special-status plant species found in the Del Monte Forest can be separated into two general categories based on their range and distribution in the forest: those species with narrowly defined occurrences in the forest and those species that are more widespread and abundant. The

former category is best exemplified by Hickman's potentilla, Pacific Grove clover, Monterey clover, Monterey cypress (indigenous natural range only), Gowen's cypress (naturally occurring), sandmat manzanita (significant occurrences), and the coastal dune species. Some of these species (e.g. Hickman's potentilla, Monterey cypress, Gowen's cypress, some dune species) are truly limited in their range and merit the highest conservation measures. Others are either more widely distributed outside of the Del Monte Forest (e.g. sandmat manzanita with over 6,500 acres preserved at Fort Ord,) or apparently limited as a result of the vagaries of taxonomy (in the case of Pacific Grove clover) or forest ecology (in the case of Monterey clover and fire-dependency). Nonetheless, under existing conditions, all these plants are of limited occurrence in the Del Monte Forest and their locations have been carefully considered in the development of the Del Monte Forest Plan so that no significant disruption of their habitat will occur as a result of development proposed by the DMF Plan. Furthermore, all areas within the forest supporting these species (with the exception of the small area of Pacific Grove clover at the equestrian center that will be within the footprint of the new golf course) have been set aside as open space preserve areas in the DMF Plan.

The other category of special-status plants in the DMF Plan area consists of those species that are abundant throughout the forest and may or may not also be more widespread outside the forest. These plants include Hooker's manzanita, Yadon's piperia and, most conspicuously, Monterey pine itself. Monterey pine is abundant throughout the Plan area (not to mention throughout the world as a landscape and commercial tree) and its presence defines the primary habitat type on the entire Monterey Peninsula. The intent of designating Monterey pine as a special-status species was not for the purpose of protecting every tree, but rather to provide a means of addressing the protection of a sustainable population of Monterey pines in the context of a viable forest habitat (see Grove 1999 and Monterey Pine Forest Report prepared under separate cover). In that context, the DMF Plan has established preserve areas that include large blocks of Monterey pine forest in the Huckleberry Hill and Pescadero Canyon (Area PQR) areas and the former subdivision areas (Areas G, H, I-1) adjacent to them. The DMF Plan has been formulated on the premise that the key to the preservation of Monterey pine as a species is meaningful habitat preservation and management of over 700 acres of contiguous Monterey pine forest habitat in perpetuity.

Similar to Monterey pine, Yadon's piperia and Hooker's manzanita occur throughout the Del Monte Forest. In the case of Hooker's manzanita, it is also relatively widespread within its limited geographic range outside the forest (e.g. over 5,000 acres of Hooker's manzanita habitat are in preservation status at former Fort Ord). Hooker's manzanita is a common to abundant component of the understory of Monterey pine forest and mixed conifer forest at higher elevations within Del Monte Forest. Specifically, it is one of the most abundant shrubs within unburned portions of the Huckleberry Hill N.H.A. Consequently, preservation of a substantial extent of the Del Monte Forest population of Hooker's manzanita has already occurred, in a large patch of preserved habitat set aside in anticipation of the ultimate buildout of the Del Monte Forest, including the Del Monte Forest Plan. Over 80 percent of the known occurrence of this species in the Del Monte Forest is in DMF Plan-designated preserve areas.

Yadon's piperia is also distributed more widely than the Del Monte Forest, but the center of its distribution appears to be the DMF. The total population of Yadon's piperia is now believed to

exceed 80,000 individuals, ranging from Blohm Ranch and Prunedale in Northern Monterey County southward to Palo Colorado Canyon in the Big Sur area. Approximately 17,000 plants occur in areas under protective land use designations, both within and outside Del Monte Forest. Approximately 46,000 plants occur within the Del Monte Forest Plan area. Within the Del Monte Forest, the largest population (approximately 16,000) occurs in the Pescadero Canyon area (Area PQR), and probably extends into adjacent unsurveyed land. The second largest population (approximately 8,000) occurs in the Huckleberry Hill N.H.A. Smaller populations are found in other locations in the Del Monte Forest (i.e. Areas G, H, I-1 and L), which are set aside as open space preserve areas by the DMF Plan. In past discussions regarding the impacts of the previously proposed Lot Program, the Pebble Beach Company and the California Department of Fish and Game reached agreement on appropriate mitigation for the loss of Yadon's piperia that would have resulted from the RA2 project (Hunter 1999). Mitigation acceptable to CDFG included initial preservation of a minimum of 72 percent of the known population of Yadon's piperia in the forest and phased residential development of Areas G ,H and I-1 only if a transplanting program in other areas was successful. The DMF Plan preserves over 75 percent of the Yadon's piperia in the forest and has eliminated all development in Areas G, H and I-1, setting them aside as permanent natural open space. Thus the mitigation for Yadon's piperia previously specified by CDFG will be realized through implementation of the DMF Plan.

5.2 Development Areas

5.2.1 Special-Status Wildlife Species

No significant habitat for any of the special-status animals observed or expected to occur in the Del Monte Forest occurs in any of the areas proposed for development as apart of the DMF Plan. The proposed golf course area is perhaps the largest block of Monterey pine forest under consideration for development, but the area is already fragmented, surrounded by residential and active (e.g. golf courses, equestrian center, driving range) recreational uses and isolated from other similar blocks of forest, thereby detracting from its overall habitat viability for forest-dependent wildlife (see also Monterey pine forest ESHA discussion above). Seasonal wetlands and a small area of freshwater marsh with potential to provide non-breeding (e.g. retreat, movement) habitat for the California red-legged frog occur in this area, but no red-legged frogs have been recorded from the area and recent, systematic, protocol-level surveys for the frog were negative in this area (See Appendix D). In any case, all wetlands in the golf course area will be avoided and suitable buffers will be established to preserve existing habitat values (see wetlands section). Dune-associated sensitive wildlife species such as black legless lizards and coast horned lizards could potentially be found within the limits of the designated dune rehabilitation area planned for golf course use. However, such occurrences would likely be ephemeral (e.g. movement through the area) given the degraded nature of the dune substrates in the area. In addition, an active relocation effort prior to construction would reduce the potential for harm to these species or any significant disruption of their habitat. Directed, seasonally-timed surveys for Smith's blue butterfly during the summer 2000 flight season failed to locate any of these butterflies in any locations along the 17-Mile Drive, including Areas M & N (See Appendix C).

5.2.2 Special-Status Plants

Golf Course, Clubhouse, Maintenance Facility and Golf Cottages (Areas MNOUV)

The special-status plant species that occur in and near the new golf course area are Monterey pine, Hooker's manzanita, Hickman's onion, Yadon's piperia, Pacific Grove clover, beach layia, Tidestrom's lupine and Monterey spineflower. An assessment of the occurrence within development areas and project-related effects on Monterey pine and Monterey pine forest habitat is presented in the Forest Management report prepared under separate cover.

Two relatively large populations of Yadon's piperia, consisting of approximately 6,000 plants in each, are found scattered through Areas N and O in the new golf course area. Another, smaller population occurs along Forest Lake Road in Area V. The analysis conducted for the EIR on the Lot Program estimated the occupied acreage of Yadon's piperia habitat within the golf course footprint to be about 41.73 acres. An area of slightly less than two acres (1.85 acres) was also identified for low density (3.7% total cover/acre) Hooker's manzanita in Area O. Small (totaling about 0.02-acre) isolated occurrences of Hickman's onion are found within the golf course footprint, adjacent to the existing driving range in Area V along Forest Lake Road. In the existing equestrian center, a small, disjunct patch of Pacific Grove clover was identified in May 1995, in a disturbed area heavily used as a practice ring and for other equestrian events. The area occupied by Pacific Grove clover in 1995 was estimated at about 0.40-acre. Subsequent surveys have confirmed the continued presence of this plant in the equestrian center area (see Appendix A), but because of the active disturbance regime in the area and the annual nature of the clover, the occupied area and population numbers vary from year to year. The other group of special-status plants (beach layia, Tidestrom's lupine, Monterey spineflower) associated with the golf course area occur in the remnant dune substrates in Area M. Mapped locations for all these occurrences are presented in the attached Plates.

Except for Hooker's manzanita and Yadon's piperia, all occurrences of special-status plant species within the golf course footprint will be avoided through golf course design. The Hickman's onion colonies will have no greater encroachment than exists today with the current Pebble Beach Driving Range. The Pacific Grove clover area will be included as a managed habitat element within the new golf course with all necessary procedures (e.g. managed/experimental disturbance regime as recommended by Jones and Stokes Associates) to assure its long-term survival. All of the occurrences of dune species are outside of the golf course footprint and will be included within the area set aside as permanent open space preserve.

Employee Housing (Area B)

The only special-status plant species found in Area B (besides Monterey pine) is Yadon's piperia, which occurs east of the existing maintenance access road through the area. This road defines the eastern limit for any development activity. All piperia in Area B will be set aside in a permanent open space preservation area.

Spanish Bay Driving Range (Area C)

The only special-status plant species found in Area C is Monterey pine.

New Equestrian Center (Upper and Lower Sawmill Quarry)

In addition to Monterey pines, the sawmill quarry area supports a considerable number of planted Gowen cypress (estimated by the Lot Program EIR at 536 trees) and Bishop pines (estimated by the Lot Program EIR at 273 trees). The Sawmill site has served as a restoration area for Gowen cypress and Bishop pine as part of the quarry reclamation plan. These trees were planted in the degraded habitat remaining in the floor of the two sawmill quarries after excavation of all topsoil and much additional fill material. Although this revegetation effort has met with modest success (i.e. many of the planted trees are surviving) in spite of the lack of suitable soil conditions, the trees have not formed a viable forest community. Sufficient opportunity exists in degraded areas within the Huckleberry Hill NHA to replant both Gowen cypress and Bishop pine in the context of restoration of a mixed Monterey pine-bishop pine-Gowen cypress forest habitat.

Residential Lots

Mapped locations for Yadon's piperia, Hooker's manzanita and Hickman's onion occur in Areas F1—F3, I-2 , J & K and in those areas of Area PQR proposed as infill lots. While all occurrences of Hickman's onion will be avoided with adequate setbacks from lot building envelopes, residential development in these locations will result in some minor displacement of the piperia and the manzanita. An analysis of specific building envelopes and impacts on these species will be prepared under separate cover as lot-specific plans are finalized.

Other Facilities

None of the other facilities proposed as part of the DMF Plan (e.g. Employee Housing at the Corporate Yard, Improvements to the Pebble Beach Lodge or Inn at Spanish Bay) will occur in areas known to support special-status plants. Biological reports were prepared by Mr. Vern Yadon for proposed improvements to the Lodge at Pebble Beach and the Inn at Spanish Bay (see Appendix A). Existing uses and disturbance regimes at the Pebble Beach Corporate Yard preclude the establishment of any sensitive species.

6.0 SPECIAL-STATUS SPECIES MANAGEMENT PROGRAM

As noted above, the preservation and appropriate management of large, contiguous blocks of Monterey pine forest habitat will assure the long-term sustainability of most of the special-status animals with potential to occur in the forest and many of the plants that are well-distributed throughout the forest. Preservation, enhancement and restoration of remnant dunes and wetlands, as specified in additional biological resource reports prepared under separate cover, will provide added habitat value for those species adapted to those particular environments. In addition to the general habitat enhancement and restoration activities for the various habitat types

in the DMF specified in those other reports, directed species-specific efforts will also occur for the following special-status animals and plants.

6.1 Special-Status Wildlife

6.1.1 Legless Lizard and Coast Horned Lizard

Prior to any construction in disturbed dune or near remnant dune areas, directed surveys for both coast-horned and legless lizards will occur. Legless lizards are fossorial (burrowing) animals so that adequate pre-construction surveys will involve systematic, subsurface searching. If any coast-horned or legless lizards are found, they will be captured and released into nearby remnant dune areas. The limits of these dune areas will be clearly staked and fenced with small mesh construction fencing, buried to a minimum depth of six to ten inches below grade to reduce the likelihood of lizard reentry into the construction zone. During construction of the golf course and related facilities in the vicinity of the dunes, a qualified biologist will be on hand with the authority to temporarily stop construction activities until any coast-horned or legless lizards found can be successfully relocated. Even if some coast-horned or legless lizards are present under pre-restoration conditions, the improved habitat conditions that will result from removal of weeds and establishment of diverse native vegetation in the remnant dune areas can reasonably be expected to support additional individuals.

6.1.2 Nesting Raptors

As noted previously, the Del Monte Forest area currently support potential nesting habitat for several species of hawks and owls. Birds-of-prey are protected against take, including destruction of nests, pursuant to Section 3503.5 of the Fish and Game Code. Disturbance from construction activities or destruction to any active raptor nest would be in violation of the Fish and Game Code.

In the mild climate of the coastal region, hawks and owls will typically begin their nesting activity in March. Hawks may have young present at the nest site as late as June 30. Therefore, tree removal that occurs from July 1 through February 28 would likely not result in harm to nesting raptors. If tree removal is to occur at any time between March 1 and June 30, then the following procedures shall be followed.

- A pre-tree removal breeding season survey (March 1 through June 30) of the trees planned for removal during construction of the golf course and other Plan improvements shall be conducted by a qualified biologist to determine if any active birds-of-prey nests occur in the trees to be removed.

- Birds-of-prey nesting surveys shall be conducted during the season when trees are to be removed and shall be valid for only that season. Subsequent surveys shall be required if the tree removal is delayed into the next season.

If these surveys reveal no nesting birds-of-prey in any trees to be removed, then no further measures shall be required. If any active bird-of-prey nests be found in any trees to be removed, then the following procedures shall be followed.

- All bird-of-prey nest sites shall be avoided during the breeding season while the nest is occupied with adults and/or young (March 1 through June 30). Avoidance will include the establishment of a site-specific, non-disturbance buffer zone around the nest site that prohibits vegetation and tree removal, as recommended by a qualified biologist. Tree removal can begin after June 30 or when a qualified biologist determines that the nest is no longer being used for that season.

6.1.3 Bat Species

Surveys conducted in 1994 concluded that the pallid bat is likely to occur in the Del Monte Forest area. Removal of tree roosting sites could directly impact this species and eliminate potential habitat with an adverse effect on population levels. Clearing of forest habitat may remove foraging habitat, but the increase of edge habitat and more moist, irrigated environment could balance this effect by increasing forage habitat and insect availability in the long-term.

As noted above, the establishment of open space forest set-asides and appropriate ecological management (in particular, provisions that dead trees or snags be left or created), will provide ample habitat opportunities for "generalist" wildlife including bat species.

In addition, efforts will be made to construct artificial roosts in open space preserve areas. Design of experimental roosts for bat species will be undertaken with advice from experts in those species. The roosts will be incorporated into bridges, culverts, or other structures that receive little human intrusion, and use by bats monitored. Insect control programs will use best management practices, and will not be undertaken without consultation from experts to minimize effects to bats from direct or food chain poisoning or through reduction of their food base. Monitoring of tree removals (perhaps in concert with that for raptors) will be conducted to assess the presence of bats in trees to be removed and document the characteristics of those trees.

6.2 Special-Status Plants

Several populations or subpopulations of the special-status plants (e.g. Hickman's onion, Yadon's piperia, Hooker's manzanita) will be preserved and managed in place in the context of recreational or residential development. In addition, planting of special-status plant species that are known from the project area enhances habitat values and contributes to the mitigation of direct or indirect impacts upon those species. The species listed below are expected to be managed and planted or transplanted to one degree or another as elements of the overall forest management program. Ecological enhancement actions, other than planting, will also be undertaken for Monterey clover and Hickman's potentilla

6.2.1 Gowen's Cypress and Bishop Pine

Both planted Gowen cypress and bishop pine trees are expected to be removed to construct the new equestrian center. This direct impact will be mitigated by restoration of approximately 1.6 acres of Gowen cypress and bishop pine forest habitat in an existing cleared area (formerly a skeet shooting practice area) within the Huckleberry Hill Natural Area.

Restoration in the former skeet shooting site will be achieved by first eliminating existing non-native vegetation and native species that do not occur within Gowen cypress forest or mixed conifer forest. Elimination of undesirable and non-target vegetation may be accomplished by means of slashing, uprooting, or by means of herbicide (glyphosate or equivalent). This vegetation elimination may be phased in order to avoid creating an excess of disturbed open ground, which is conducive to invasion by noxious weeds. Following elimination of competing vegetation, or concurrent with it under the phased-removal approach, Gowen cypress and bishop pine seedlings grown from Huckleberry Hill seed stock shall be outplanted during the fall, with the objective of achieving sapling densities averaging at least 400 per acre. Initial planting densities will be 10-30% higher than the target density (exact percentage to be determined). Replacement planting will be carried out as specified under the monitoring criteria and contingent action sections of the overall forest management program (see above).

Restoration of the unsurfaced road segments will be carried out by planting Gowen cypress seedlings at densities similar to those of the skeet shooting restoration area. For road segments where site study suggests that the soils may be so compacted as to prevent establishment or to substantially retard growth, soils may be ripped to a depth of 6-12 inches prior to planting. At present, placement of additional "topsoil" on road areas to be restored is not proposed, because this seems likely to favor the growth of weedy species over Gowen cypress, bishop pine and their normal associates. As needed, erosion control will be applied on a site specific basis, using such means as roughening the soil surface; small water bars; mulching with either rock, wood, or bark chips; and/or planting of appropriate (non-competitive) nurse species.

Restoration of replacement Gowen cypress/bishop pine habitat shall be initiated prior to construction of the equestrian center.

6.2.2 Yadon's Piperia

Monitoring of experimental transplants within the Del Monte Forest has shown that survivorship of approximately 70% (possibly higher) can be achieved with this piperia in suitable sites. Plants will be salvaged from construction areas prior to any work in those areas. The exact locations of plants to be transplanted ("donor" plants or sites) will be marked when in leaf or flower. Corms (bulb-like underground stems) will be transplanted preferably when dormant, but may also be successfully transplanted if recovered late in the vegetative growth period (e.g., April). Donor plants will be removed from naturally or artificially moistened soil to minimize damage, and will be planted in locations with suitable soils (sandy loam), moderate surface hydrology, and limited competing vegetation or overstory. Propagation from collected seed will also be attempted. Subpopulations (or colonies) of Yadon's piperia will be translocated to the nearest suitable site, but not intermixed with existing subpopulations. To the extent feasible, translocated subpopulations shall be kept together.

Yadon's piperia appears to be able to grow and thrive over long periods of time in relatively restricted areas where suitable conditions exist. These conditions include appropriate soils (and possibly mycorhizzal fungi), moisture regimes, canopy cover and other factors. Most importantly, competition from dense understory plants seems to exclude the piperia. Also, deer browse (or weed-whacking) can be a problem for successful flowering and fruiting, possibly

resulting in the elimination of plants. Piperia maintained in open space areas in the context of development (e.g. between golf course fairways) will be managed in its natural context. Drainage will not be altered and a natural mix of understory species will be maintained. No excessive understory clearing or weed-whacking to maintain "rough" areas for golf or "park-like" conditions will occur in designated piperia conservation areas.

6.2.3 Hooker's and Sandmat Manzanita

These species are both widely used horticulturally, thus can be expected to be readily established by transplantation or by propagation (from local stock) in the nursery and outplanting in suitable site(s). For the purposes of ecological management, where these species are ecologically appropriate, mature fruits will be collected and cleaned, scarified or otherwise pretreated, and the resulting seeds distributed. Alternatively, plants may be started in the nursery and outplanted in late fall or early winter (thus, under ordinary climatic conditions, generally in November or December). Existing occurrences of these species in the context of development can be managed successfully as long as natural vegetation, soils and drainage patterns are maintained.

6.2.4 Hickman's Onion

Restoration of Hickman's onion habitat in the wet meadow in Area PQR, where a trail crosses the existing occurrences, will be implemented by propagation of individuals in the nursery collected from the surrounding occurrence and outplanting of the resulting plants. Other suitable sites in preserved open space areas may also be enhanced in a similar manner. Soil may be scarified or not, and/or may be seeded with native species that co-occur with Hickman's onion, according to the judgment of Pebble Beach Company resource staff who are experienced in transplantation/outplanting of the species. Existing occurrences of Hickman's onion in the context of development can be managed successfully as long as natural vegetation, soils and drainage patterns are maintained.

6.2.5 Pacific Grove Clover

This species is closely related to, or belongs taxonomically within, the common and widespread white-tip clover (*Trifolium variegatum*), which sometimes grows as a weed in lawns. Both species are adapted to soils that are seasonally moist at some distance below the surface. Whereas white-tip clover is a facultative-wetland species, Pacific Grove clover seems to occur in sites that are similar to or slightly drier than wet meadows that meet jurisdictional wetland criteria (that is, corresponding to a plant community including facultative and upland species). Pacific Grove clover apparently occurs more abundantly where competition from taller species (e.g., grasses) is minimal or reduced. Reduction of competing vegetation may either result from substrate (coarse sandy surface vs. loamy surface layer that is more conducive to growth of grasses) or from disturbance (intentional or otherwise).

Re-establishment and enhancement of the Pacific Grove Clover population within the golf course or establishment of new occurrences will be achieved by the following steps:

- Select a site or sites that is/are ecologically as similar to the existing occurrences as can be found. If feasible in the context of project development, the preferred alternative is to expand the existing occurrence in directions that will not conflict with golf course elements. Alternatively, another ecologically appropriate site may be located within the golf course, or, if a suitable mitigation site cannot be found within the golf course, an off-site mitigation area shall be used.

- Modify the mitigation site(s) to achieve facultative or facultative-upland hydrology, establish a soil surface and profile similar to that of the existing occurrences, and minimize competing vegetation. This modification may include light grading, placement of soil (with its seed bank) salvaged from the area designated to be affected by golf course development, and/or placement of other suitable soil materials (specifically, coarse materials that are less conducive to the growth of competing vegetation).

- Plant the mitigation site with locally-collected Pacific Grove clover seed supplemented with other species that occur with it in the existing occurrence of greatest Pacific Grove clover abundance. Seed may also be acquired from the existing occurrence by harvesting a very thin layer of soil and seed bank (probably one to three inches thick; to be confirmed by nursery experimentation) from narrow strips (one to two feet wide), to total no more than 10% of the area (thus, a maximum of approximately 1,300 square feet).

6.2.6 Hickman's Potentilla

This plant occurs in a vernally moist, grassy/weedy area at Indian Village on lands owned by the Del Monte Forest Foundation off of Pebble Beach Company property. The occurrence is protected by a post-and-cable exclosure, and the property owners, Department of Fish and Game, and Pebble Beach Company collaborate in the continued monitoring, protection, and recovery efforts to benefit the species. As part of the Del Monte Forest Plan, the area surrounding Indian Village (Area L) will be established as a permanent open space preserve. The Pebble Beach Company shall continue to participate in the ongoing efforts to protect and enhance this species and its habitat by contributing to the management of the site and its watershed, monitoring and regulating use of the area to the extent feasible and other means as deemed appropriate in collaboration with the Del Monte Forest Foundation and CDFG. Appropriate signage directing pedestrians to use pathways away from the occurrence shall be installed and/or improvements to the exclosure may be made if necessary.

6.2.7 Monterey Clover

This species exists as a seed bank in several very limited occurrences, specifically in Area G and in other areas around the Huckleberry Hill NHA. At present, the plant has been observed only in areas that have recently burned.

Contingent upon permission from the California Department of Fish and Game and local fire protection agencies, experimental ecological management to regenerate the seed bank will be achieved by locating recent or historic occurrences within Area G and/or in other existing

conserved habitat areas as precisely as possible and treating them according to a prescribed burning treatment for Monterey pine forest.

6.2.8 Dune Species

Four endemic dune species that are either state- or federally listed, or both, occur in dune areas in the vicinity of the golf course: Tidestrom's lupine, beach layia, sand gilia and Monterey spineflower. Direct impact on the dune habitat areas where the plants occur is not proposed, but expansion of the populations of these species is proposed to be undertaken (contingent upon Department of Fish and Game approval for collection of seeds) in areas of dune habitat that are restored and created as described above under the section on dune habitat. For each of these species, at least two new colonies will be established by distributing seed collected from the existing occurrences, supplemented by seed from individuals propagated in the nursery. The number of seeds to be collected will be limited to a small percentage of the fruits from any one plant. Scarification prior to propagation or distribution in the field will be applied as appropriate to each species.

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APPENDIX A
PLANT SURVEYS

Survey data from Vern Yadon

APPENDIX B
2001 AVIAN SURVEYS

Chris Tenney Report

APPENDIX C
2000 SMITH'S BLUE BUTTERFLY SURVEYS

Dick Arnold's Report

APPENDIX D
1999 & 2000 California Red-legged Frog Surveys

Report from Golfauna

PLATES

Note: the plates included here were produced by WWD Engineering and include an aerial photograph of each DMF/PDP area with the special status species locations identified. Graphics for this section should be obtained from WWD.