SAND CITY

PROPOSED

HABITAT CONSERVATION PLAN

DRAFT

FEBRUARY 1993

PREPARED BY
THE CITY OF SAND CITY
AND
THOMAS REID ASSOCIATES

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PREFACE

The City of Sand City, Thomas Reid Associates (TRA), and other interested third parties have labored over four years in preparation of this Habitat Conservation Plan (HCP). By its very nature, an HCP presents a very difficult planning exercise involving scientific, legal, financial, administration, and long-term management elements. A very emotional dynamic is created when these elements are added to issues of property rights, growth and development, open space, and conservation.

Beyond these difficulties, the Endangered Species Act has created a very complex process for conservation and development within areas of rare or endangered species. Even in areas of thousands of acres, the process to approve a plan to protect species and allow development is difficult.

However, it is doubtful that the Act was designed for existing small, urbanized areas, where habitat has been isolated by years of commercial and industrial activity. No where is that more relevant or difficult than in Sand City.

The City of Sand City would like reviewers of this HCP is be aware of four major compelling factors in the development and implementation of this HCP.

1. Although the HCP proposes new habitat areas in the coastal zone, west of Highway One, surveys of that area show no endangered species at present. Areas suitable for dune stabilization and removal of invasive ice plant are already required by the Sand City Local Coastal Program (LCP) to promote enhancement of rare or endangered species in landscaping or habitat plans. This applies to development plans for both private and public land owners and uses.

   Without rare or endangered species present, any development along the coast is <u>not dependent</u> on approval of the city-wide HCP. The Sand City HCP uses the LCP requirements as part of its efforts to mitigate potential species habitat loss from development <u>not</u> in the coastal zone west of Highway One. The HCP is proposing the area west of Highway

for the creation of new habitat for rare and endangered species, helping to promote gene diversity and new populations of species.

2. Sand City is a municipality of only 350 acres and the HCP is dealing with a potential loss of habitat of less than 14 acres. With regards to the regional context for species of concern, this represents a less than significant amount of habitat loss when compared to the much larger universe of the species on the Central coast.

   This universe includes vast areas in Fort Ord, Carmel Valley, Big Sur, Salinas River, Moss Landing, Marina, and Santa Cruz County. With regards to the Smith Blue butterfly, TRA states that "This loss is not considered significant to the long-term survival of the butterfly throughout its range".

   Given the large universe of these species, it is apparent that even if the Sand City HCP were 100% successful, its small and isolated habitat size will most likely not assist the larger population in its long-term survival. The HCP as proposed would add new connecting elements where none exists at present, a new element of potential dispersal of SBB north to Fort Ord and south to Roberts Lake in Seaside and the coastal area north of Monterey. The proposed city-wide HCP will be beneficial to the Sand City population but are only marginal in the total universe of the species. The City's biological consultant has concluded that if extripation of the Sand City Smith Blue butterfly were to occur, it would still not be a significant loss to the larger universe along the Central Coast.

3. The small and fragmented land parcels which make up the areas of concern in the HCP are in direct contrast to other plans approved in the state or the region. As a stark example the City of Marina HCP involves only a few land owners and over 626 acres of habitat. This provides the ability for both conservation and species protection as well as enough development rights for the property owners to set aside this much land for habitat. This luxury is not available to Sand City. There are no large parcels to utilize such a beneficial habitat and financial arrangement. In contrast, the primary habitat area (the East Dunes) has many land owners and is only approximately 14 acres in size.

4. The City of Sand City has already (in 1989) created new and enhanced habitat in advance of take in Sand City and before approval of this HCP. This was done, in accordance with the City's LCP and General Plan, by conditioning a major shopping center (Sand Dollar Shopping Center/Costco) to set aside over seven (7) acres. This area was cleared of ice plant and planted with rare and endangered species including

coastal and dune buckwheat and various supporting plants from the maritime chaparral species.

The City currently monitors this area for biological success. This effort by the city to create new habitat in advance of take has been very successful with recent monitoring (1992) showing expansion of Smith Blue Butterfly population and vigorous rare plants. Additional plantings of Monterey Dune Gilia are currently going on as well, and will be monitoring through 1992 and inventoried in the spring of 1993.

5. The difficulties in developing a workable and effective HCP strategy, continue to mount as new species and habitat are listed as endangered or are proposed for listing. Based on new information and suggestions from the Service, this Draft HCP could undergo additional and extensive modifications.

6. With the recent habitat information on Fort Ord, there is a special opportunity to create a more suitable, regional habitat area or "bank" within the thousands of acres within the military installation. This is being proposed as an Alternative (see Section 5.5 in Draft HCP) approach for mitigation of incidental species or habitat "take" in Sand City.

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1.1 Introduction

The City of Sand City is a coastal community located just north of the City of Monterey (see Figure 1). Actions by the City of Sand City in allowing urban development as specified in its Local Coastal Program and General Plan may result in an incidental take of species protected by state and federal law. Accordingly, the City of Sand City is the lead agency seeking a permit under Section 10(a) of the Endangered Species Act from the U.S. Department of Interior Fish and Wildlife Service (hereinafter referred to as "Service"). In support of the application, the City proposes to implement a Habitat Conservation Plan (HCP) to meet the requirements of law for a Section 10(a) permit.

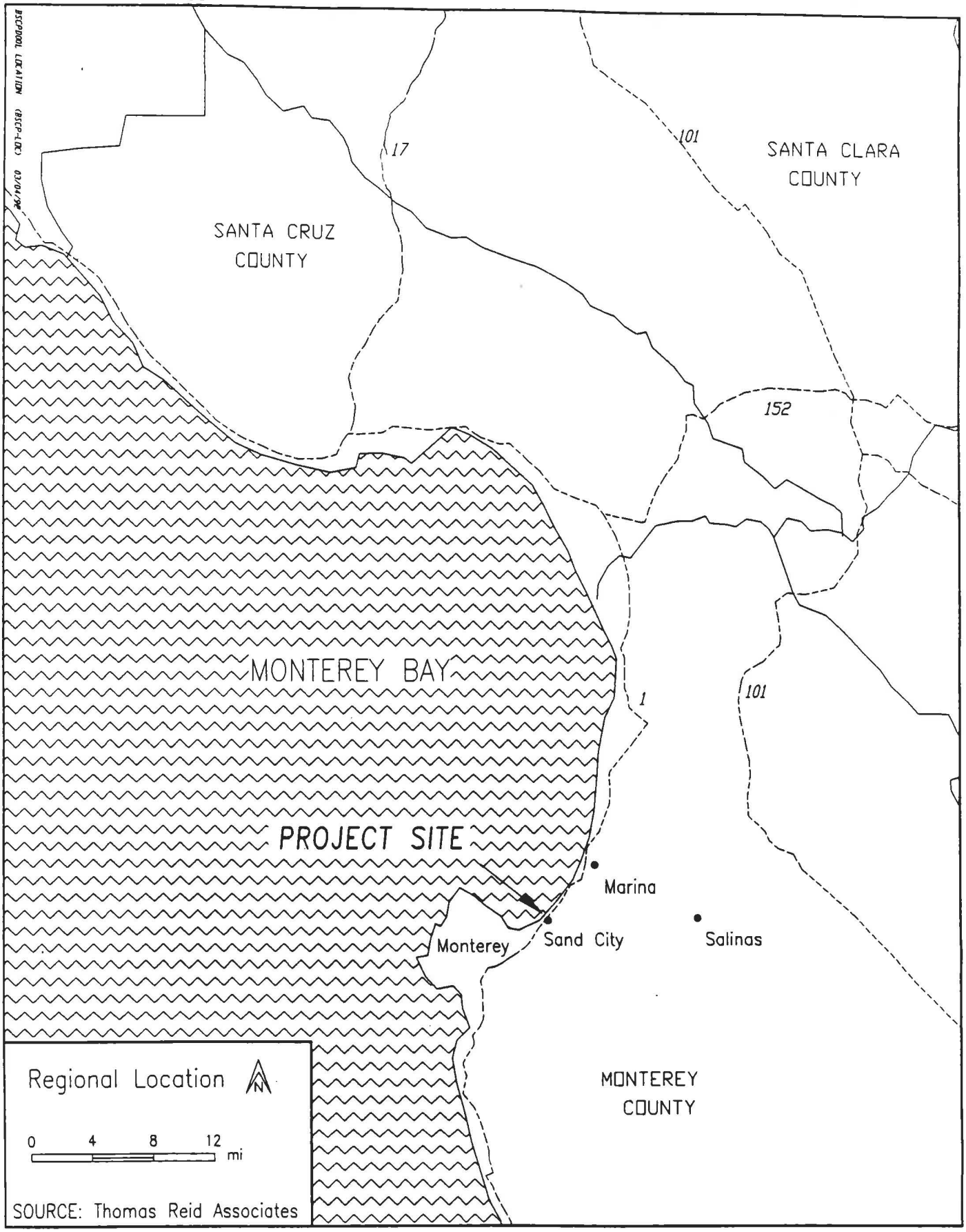
The HCP would serve as detailed terms and conditions for actions under the permit. The HCP is integrated with the City's LCP and General Plan and provides a delineation of where conservation and development should occur within the City. Figure 2 shows the Proposed HCP Land Use Plan and Map which is the basis for this HCP. The HCP Land Use Plan shows the location of preserved habitat, restored habitat (habitat corridors), and areas where development is allowed. The HCP Land Use Plan has the City broken down into various sub areas, indicated by circled capital letters on the map. Land uses and activities proposed for each of these sub areas is described in the table following the map. Land uses described are meant to balance conservation with the need for residential, commercial, and visitor-serving, coastal dependent uses in the City.

An important consideration in the development of this HCP is the fact that the coastal area of Sand City west of Highway One does not contain existing rare or endangered plant or animal species. It is an area where massive sand mining operations have degraded the dune environment. This area is proposed for extensive dune restoration and revegetation in concert with public and private development activities. One area which contains several coastal buckwheat plants is severely impacted by ice plant and no known populations of Smith Blue Butterfly have been observed there.

Chapter 2 describes the biological resources of concern which are the focus of the HCP effort. Chapter 3 describes policies and regulations which govern land use in the area.

The HCP would be carried out pursuant to an agreement entered into by the City and other signatories involved with actions under the Section 10(a) permit. Chapter 4 describes how the HCP will be implemented, and participant roles in the HCP. It describes how the Plan will be administered, how it will be funded, how it can be amended, and how the US Fish and Wildlife Service can enforce the Plan.

FIGURE 1 -- PROJECT LOCATION



Proposed development in Sand City, especially the "East Dunes" will result in "take" of the Coastal and dune buckwheat plant which is the host plant for the federally endangered Smith's Blue Butterfly. It will also result in a "take" of the dune gilia (gilia), which has been proposed for listing as a federally endangered species. The City is aware that the HCP must create a program to compensate for this "incidental take". The Proposed HCP is the City's effort to develop a comprehensive plan for replacing and enhancing the habitat which would be removed as result of the development.

In addition to the Proposed HCP, there are four additional alternatives discussed in Chapter 5:

- The no project, or status quo, alternative would result if no incidental take permit is issued by the USFWS. No project would probably result in continued conflicts between private property owners and rare and endangered species, and continued piece meal development in and around the East Dunes.

- The maximum conservation of existing habitat would require the City or other agency to purchase over 227 full lots and 42 partial lots from individual property owners, estimated as high as $ 6.6 million (based on $25,000 per lot). These lots are 25' x 75/90' and are owned by numerous individuals and businesses.

- The High Density Habitat Preservation and Development alternative would preserve the highest density habitat in the East Dunes, allowing development to take place on the low density habitat.

- The Regional Habitat Mitigation Banking Program proposes an off-site (Fort Ord) habitat preserve land set-aside and financing program to mitigate all or some portion of any incidental "take" in Sand City.

The City believes that the Proposed HCP is the most feasible City-wide conservation effort which the City and property owners can undertake from the considerations of costs, property rights, housing, land use constraints, and survival of the species. The City believes it is a habitat and funding program that will be successful for the survival of endangered species as they currently exist in Sand City. It is a program that has the potential to actually increase sensitive habitat and species population in Sand City.

The reality that the Proposed HCP addresses is that if nothing is done, piece meal development, invasive non-native plants, and destruction from human recreation and animals will certainly continue to degrade the dwindling buckwheat and dune gilia plants and may eventually eliminate these species from Sand

City. The Proposed HCP is the best effort the City can practically implement and will provide extensive habitat preservation and enhancement.

1.2 Purpose

Sand City's believes the Proposed HCP will enable the City to satisfactorily provide the mitigation necessary to obtain a Section 10(a) "incidental take" permit from the U.S. Fish and Wildlife Service. This permit will cover the entire City so that habitat conservation will be successfully carried throughout the community and will allow development and redevelopment activities to proceed in the City in a lawful manner.

1.3 Goals of the Proposed Habitat Conservation Plan

Sand City has the following goals for this Habitat Conservation Planning Program. The City's Proposed Habitat Conservation Plan will:

1. Develop a balance between the needs of the City, property owners rights, and protection of rare and endangered species;

2. Assist the City in achieving the development objectives outlined in the City's planning documents (General Plan, Local Coastal Program, Redevelopment Plan and Zoning Ordinances);

3. Protect and enhance the designated habitat areas of the City as depicted in the Proposed HCP;

4. Create new habitat areas and corridors as proposed in this plan;

5. Help to ensure the survival of endangered or threatened species located in the Sand City general area;

6. Incorporate these goals and objectives in the City's planning documents and programs, including revisions or amendments to these documents as necessary;

7. Satisfy the objectives and work program of the California Coastal Conservancy grant contract.

TABLE 1
INDEX OF NOTES ON SAND CITY'S PROPOSED HABITAT CONSERVATION PLAN LAND USE PLAN MAP

The following index is a summarized description of the alphabetical notes shown on Figure 2 -- Sand City's Proposed HCP Land Use Plan map. Letters below correspond to letter areas on map.

A. *The Proposed HCP Map shows an extension of new habitat corridor along Highway One Right-of Way and Sand Dunes Drive through Sand City from Fort Ord to Monterey and Seaside Habitat Areas.*

B. *The City's Proposed HCP proposes that the existing Sand Dunes Drive would be widened for a scenic drive, parking lane, bicycle way, and habitat corridors.*

C. *The existing active recreation beach area along the Southern Sand City-Seaside border would be recognized as "defacto" active beach area.*

D. *In the Sand City Coastal Area south of the Sewer Treatment Plant/Bay Avenue, there are 185 lots of record above the Mean High Tide line. There are seven recorded streets (or public right-of-ways) in this area- Bay, Moss, Ortiz, Vista del Mar, Rey, Pebble, and Sand Dunes Drive. As of May 1991, 84 of the lots in this area were owned by the California Department of Parks and Recreation, and 27 were owned by or under mortgage to the Monterey Peninsula Regional Parks District. It is probable that these "public" lots would be with-held from development that was proposed in the Sand City LCP and would remain as open space-public park area. Sand City's HCP would propose that these lots remain as "passive open space" to enhance habitat value. There are still 74 lots in private ownership in this area that would have certain development rights under Sand City's growth policies.*

E. *Most of the Sewer Treatment Plant site was sold recently to the State Parks Department (Blocks 7 & 8). A small corner site was retained for a sewage pumping station and a future site was reserved for the pumping station in the event the existing station has to be relocated because of coastal erosion.*

In the Proposed Sand City HCP, this area (which is designated and zoned "public facility") would be reserved for habitat restoration and preservation. The City of Sand City has conditioned the California Department of State Parks and Recreation to plant two varieties of native grass seed on the sewer plant site as an interim measure until a final plan is presented by State Parks and approved by the City. Additionally, State Parks is in the process of preparing an interim land use plan for this area which will extend the Monterey State Beach to the north. Development of this plan would be subject to environmental review and issuance of a coastal development permit by the City.

Block 8 on the west side of the Sewer plant site still has 22 lots in private ownership. Block 9 on the east side of Sewer plant site has approximately 38 lots. In May 1991, 8 of these lots (in block 9) were owned by the Regional Parks District and 30 lots were in private ownership.

F. *In this plan, the lee side dune areas along Sand Dunes Drive would be used to create new habitat "stepping stones" in this area of the City.*

G. *In the area south of Tioga Avenue (bounded by Sand Dunes Drive, Vista Del Mar Street, and Fell Street), there are 224 lots of record and all of these lots are above the existing bluff top as*

of June 1991. There are 9 platted streets in this area-Fell, Tenth, Ninth, Eight, Seventh, Sixth, Tioga, Sand Dunes Drive, and Vista del Mar.

In May 1991, the Regional Parks District either owned or held mortgages on 65 of these lots. There were 159 lots still in private ownership. Under Sand City's growth policies, these private lots could be developed with single family homes, clustered housing, apartments, condominiums, or even mobile homes.

It is possible that an agreement could be reached between the private property owners and the Monterey Peninsula Regional Park District to transfer or exchange properties to allow for more orderly consolidation of land which would allow public and private development in this area.

H. It must be pointed out that there are five blocks with 113 lots that are seaward of the 1990 Mean High Water line in the Sand City Coastal Area south of Tioga Avenue.

I. This plan includes a graphic illustration of a "stepping stone" pattern of habitat-coastal landscaping areas and corridor linkages that would be required of private/public developments as they occur along the Sand City Coast. This is a conceptual-schematic illustration only in this HCP. The actual location, size, and type of landscaping would be determined in project plans and the City's review process.

J. The City's Proposed HCP illustrates the potential for Coastal fore dune (and back dune) restoration and native landscaping that would be required in private (and public) development along the Sand City Coast. As pointed out above this is a schematic illustration only and the actual location and extent of restoration would be determined in project plans and the City's review process.

K. This HCP map recommends the extension of Sand Dunes Drive with defined parking areas, bicycle lanes, habitat corridor and specified limited public access areas, with educational-interpretive signage.

L. The City's Proposed HCP includes the development nodes that are allowed by the City's certified LCP.

M. This Site is a more definitive illustration of the amount and extent of habitat area that can be created as a condition of private project approval (as illustrated by the Sand of Monterey proposed project). This will be a key area of "stepping stones" of habitat, linked south along the corridor area mapped as A, B, F, I, N, D, and P.

N. The existing buckwheat plants located in a large ice plant field along the Sand City-Fort Ord border are proposed for major preservation and enhancement in Sand City's HCP, and this would be made a condition of approval for development of this site.

O. The Sand City HCP provides a corridor connection (on both sides of Highway One) through the entire City from Fort Ord to Monterey and Seaside Habitat Areas. (From Ord Avenue interchange to the Canyon Del Rey Interchange).

P. The Sand City Habitat program would provide the appropriate landscaping, lighting and other conditions to create a habitat connection through the Highway One-Ord Avenue interchange. This would provide a linkage between the west side and East side habitat corridors. If necessary, hand collection of butterflies and transport to other habitat areas would be proposed and monitored for success of relocation.

Q. *This is an example of corridor creation on private property. This habitat corridor would be provided along the slope area (adjacent to Highway One) through the Granite Construction Site. Other private properties would be proposed for this habitat corridor along the Highway One slope through the City. (See notes F,L,R,T,U, & V)*

R. *The City area north of Playa is being studied for Master Site Redevelopment plan (and EIR) with the possibility of a consolidated habitat set aside. This area has the potential of being developed in a manner similar to the Sand Dollar Shopping Center. The existing habitat adjacent to the Freeway is proposed for set aside (see #S) and the smaller habitat areas will receive further consideration in a site specific habitat plan (See #T).*

S. *Private property adjacent to Highway One (North of Playa Avenue) has been proposed in previous City documents as a habitat preserve. This area would be formalized in the City's HCP for preservation and enhancement. This will be another key area of "stepping stone" habitat, linked by corridors.*

T. *There is a small, poor quality habitat area north of Playa Avenue on Monterey Sand Co. property, along the S.P. railroad. A site specific mini-habitat plan is being prepared by Monterey Sand Co. that will address this area.*

U. *Habitat pre-mitigation has already proven successful at the Sand Dollar Shopping Center, as required by the City's LCP and General Plan, and imposed on the shopping center as a condition of project approval.*

Out of a 30+or- acre shopping center development, there were 7.6 acres of dune habitat proposed for preservation and enhancement under a Biological Management Plan that was prepared by Harding Lawson Associates. This dune area is presently under going restoration, and the program is making excellent progress. It provides a key "stepping stone" linking the west side habitats north and south.

V. *This East Dunes area is proposed for PUD development in the City's Proposed HCP with specified on-site and off-site mitigation as outlined in the Plan. A habitat corridor would be created alongside the Highway One Freeway to maintain the habitat linkage through this area of the City. Refer to the plan text for a further description of the proposed mitigation for the proposed habitat "take" in this area. There are approximately 277 full lots and 42 partial lots of record in the East Dunes general habitat area as originally described by Reid in 1989.*

There are 14 platted streets in the East Dunes area-(Alta, Farmer, Park, Fell, Ocean View, Scott, Lincoln, East, Hayes, Beach, Fir, Afton, Myrle, 6th Way.)

The Habitat corridor along Highway One right of way will include 43 private lots of record. This private parcel set aside will be finalized in the East Dunes PUD.

It is estimated that the new or enhanced habitat land areas proposed for mitigation for "take" in the East Dunes will approximate almost 7:1 (7 acres of habitat pre 1 acre of take). The exact amount of land and its precise location will be finalized in the formal U. S. Fish and Wildlife Service 10A application, arrived at after negotiations with the Service. All acreage figures presented are estimates and will be finalized with the Service when the HCP is approved.

W. *This is another example of where a habitat corridor can be created on private property by the City's HCP by using the lee dune slope along the Highway One Freeway. This will allow a connection to the Roberts Lake Habitat area. The corridor will be created through a Transfer Density Credit Program that provides a Planned Unit Development in the East Dunes.*

X. *This plan recognizes that Sand City is only a small part of the Monterey Bay dunes environment and the central coast habitat region as well as the Smith's Blue Butterfly range. The Sand City program would provide for on-site and off-site mitigation within the Sand City area and would create the opportunity to link the Sand City habitat areas together and to connect the Sand City areas to other habitat areas within the Monterey Bay Region. In addition, the Sand City program would propose a system of development fees that could be used within the City and within the Region to enhance the habitat areas of regional significance.*

Y. *This area is the beach front along the Sand City waterfront. Under the Proposed HCP this area would be used for public beach access and recreation.*

1.4 Objectives of the Proposed Habitat Conservation Plan

1. Secure and create a "Stepping Stone" pattern of habitat areas of sufficient size for Smith's blue butterfly to use as dispersal corridors.

2. Create opportunities for primary dispersion of Smith's blue between areas of maintained habitat through linking corridors on the east side of highway from the southern Seaside boundary along the CalTrans right-of-way (ROW), through the East Dunes, the Sand Dollar habitat mitigation area (Area U on Figure 2) and north of Playa (Area S) to Sands of Monterey site (Area N on Figure 2) and Fort Ord.

3. Expand the Monterey dune gilia habitat in all area of maintained habitat where appropriate for species enhancement;

4. Develop a habitat area in the East Dunes that also serves as a linking corridor and require a Specific Plan designation for this area (Area "V" on Figure 2); and provide for a Planned Unit Development (PUD) building envelope which will be used in conjunction with a program of transfer development credits and financing of habitat conservation by use of a funding mechanism such as a benefit assessment district, or Mello-Roos. See Section 4.0 for more details.

5. Prepare a detailed habitat restoration/enhancement program for all preserved habitat to enhance survival of Smith's blue butterfly and other species of concern in Sand City;

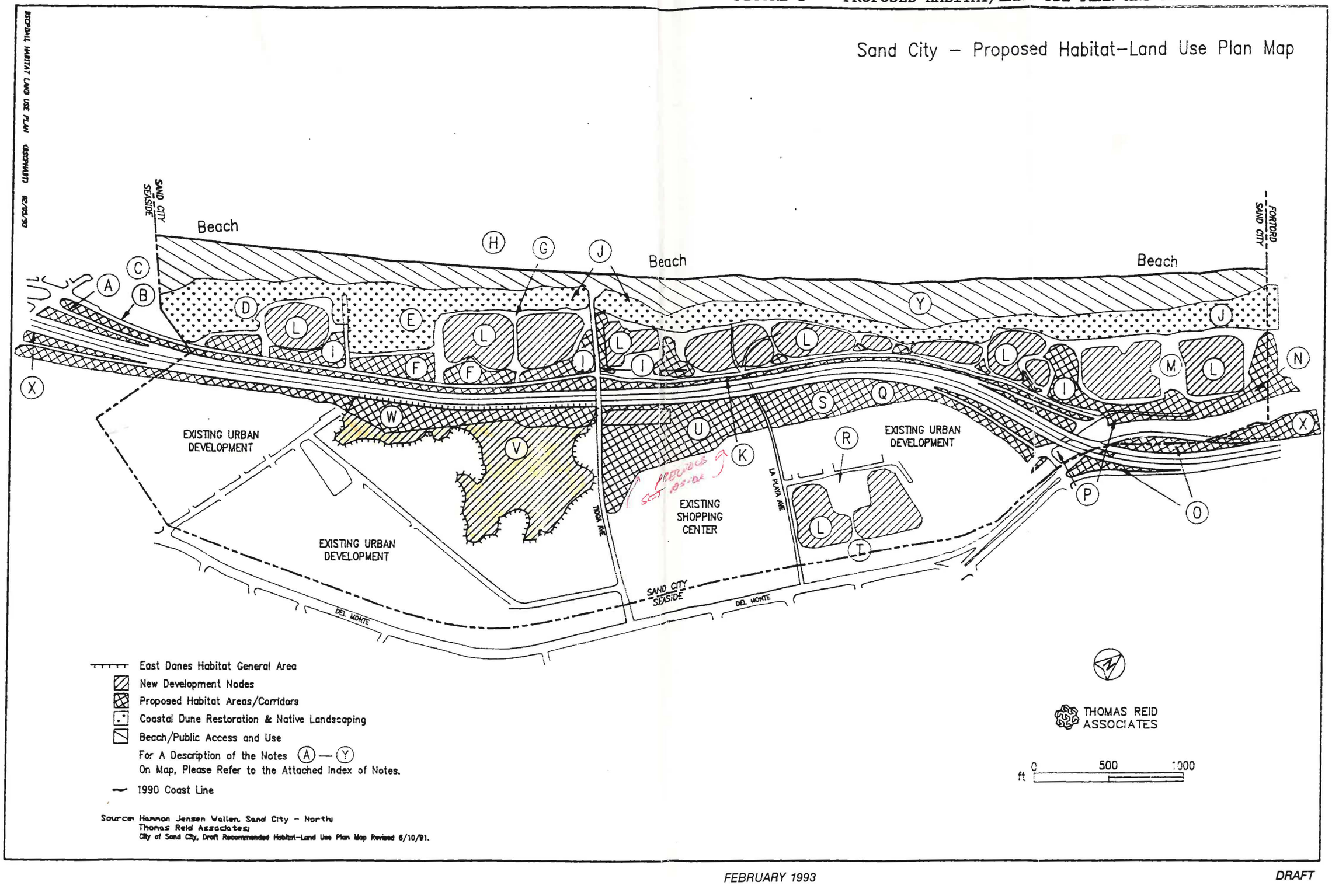
6. Create areas of maintained habitat and opportunities for possible secondary Smith's blue dispersal through linking corridors on the west side of Highway 1 where leeside dune protection is appropriate (Areas A, B, F, I, N, O, and P).

   This corridor linkage can be provided by the plan from the Sands of Monterey site and Fort Ord, along the CalTrans and Sand Dunes Drive right-of-way (ROW), mixed with appropriate project habitat areas at each development site to the north end of the City (see Figure 2);

   In the area south of Bay Avenue, larger areas of State and Regional Park land holdings will be restored to appropriate habitat for Smith's blue, dune gilia, maritime chaparral, and the snowy plover (see Figure 2);

7. Restore or maintain an appropriate mix of plant species in all preserved habitat areas. The habitat preserves should contain plant species supportive to the Smith's blue butterfly, dune gilia and maritime chaparral. For Smith's Blue this means planting two types of buckwheat (Eriogonum) in separate locations to encourage speciation (E. latifolium in frontal dunes and E. parvifolium in rear dunes).

FIGURE 2 -- PROPOSED HABITAT/LAND USE PLAN AND MAP



1.5 Pre-mitigation Area Recognition

SAND DOLLAR SHOPPING CENTER SET-ASIDE

The City is utilizing the creation of new enhanced habitat near the Sand Dollar Shopping Center for a portion of the mitigation for take in the East Dunes. This habitat area (SD Pre-mitigation) is a highly successful creation of enhanced habitat, employing native plant revegetation of degraded sand dunes.

The 7.6 acre site should be utilized to compensate in part for the Phase I development in the East Dunes.

As background for this discussion, the USFWS and CDFG should be aware of the following:

a. The SD Pre-mitigation area was required as part of implementing provisions from the Sand City Local Coastal Program and the Sand City General Plan. The LCP and GP require conditions placed upon development project which effect habitat areas.

b. This resulted in conditions of project approval for (#12-14) habitat restoration and land set-aside for the Sand Dollar Shopping Center. (See attached Appendix A containing Sand City Resolution #SC-8 (1989) requiring the creation of this habitat area and a "Biological Resource Management Plan". The City continues to monitor the condition and implementation of these conditions and the success of the SD Pre-mitigation area.

The stated goal of the Resource Management Plan is:

> "The primary goal of this resource management plan is to provide 7.6 acres of an enhanced, unified, and permanently maintained and protected block of central dune scrub habitat on the project site that will support microclimates suitable for expansion of the resident population of Smith's blue butterfly, in conjunction with commercial development on a portion of the remainder of the site."

c. The SD Pre-migitation Biological Management Pla was done before completion or approval of the Sand City HCP, however, the key point is that the City's approved planning documents (LCP, GP, and Redevelopment Plan) <u>all</u> call for preservation of rare and endangered species habitat in the whole city, <u>including</u> the Sand Dollar area.

d. The SD Pre-mitigation area of 7.6 acres was designed to satisfy city planning requirements and enhancement of a degraded dune scrub habitat area. The general pre-mitigation area had some concentrations of coastal buckwheat and also some evidence of single Smith blue butterfly. Black legless lizard was also observed.

The SD Pre-mitigation area was chosen for enhancement and set-aside because of its potential for re-creation of habitat and repair from years of sand mining activity. It was not just an area for mitigation for the Sand Dollar Shopping Center and the loss of four isolated plants. The plants themselves did not support a population of Smith's blue butterfly.

This loss was considered insignificant and "should not be considered adverse to the resident population of Smith's blue butterfly" (see page 18, Paragraph 4 of the Resource Management Plan).

In this regard, the SD Pre-mitigation area provided an opportunity to enhance an area for an endangered species and to implement provisions of the Sand City LCP, GP, and Redevelopment Plan.

It is relevant that the City receives credit for this habitat area as part of its habitat conservation areas and is credited as partial pre-mitigation for potential future "take" situations.

Other points regarding the Pre-mitigation area at Sand Dollar:

i. City Action and approval established the Habitat area - not some other governmental action. The City's HCP consultant, Thomas Reid Associates, worked with developer's consultant, Harding Lawson Associates, to develop the "Biological Management Plan". The City is monitoring activities conducted under the Plan and will assist in the transfer of responsibility (through the offer to dedicate) for stewardship from the present owner to a responsible agency.

ii. The "Offer to Dedicate" agreement for the SD Pre-mitigation habitat area should be implemented by the City. The dedication offer was worked out between the City and developer. The City may be the "agency" which must accept the dedication; and the City will be responsible for long-term success, if no other appropriate agency will assume the offer to dedicate.

1.6 Overview of Proposed Habitat Conservation Plan Land Use Map

1. Some of the new habitat corridors will use the Caltrans and Sand Dunes Drive right-of-way on the westside of Highway 1. (See Figure 2 Areas K, F, I, N, P, and X). Corridors will also use existing leeside dunes areas, allowing for successful planting of native habitat and not interfering with the regional sewer plant utility easement lines;

2. Expands and enhances the existing buckwheat habitat on the Sands of Monterey site (See Figure 2 Area N), and connects this to the colonies north in Fort Ord, and then expands southerly through the Highway 1/Ord Avenue interchange to connect to an expanded and enhanced habitat north of Playa Avenue, thereby providing steeping stone corridor to the newly established habitat west of Costco/Sand Dollar Shopping Center;

3. Provides for re-planting the entire Caltrans right-of-way east and west of Highway 1 with native plants;

4. Encourages large clusters of native and endangered habitat, where feasible, southerly along the east side of Highway 1 to connect habitat in the East Dunes;

5. Creates an East Dunes habitat corridor to link habitat areas to the north and to the south. Development must conform to a Specific Plan and property owners must agree to a joint venture agreement for transfer development credits which identifies developable areas and conserved habitat areas. See Section 4.0 for details.

6. Provides for a mitigation monitoring program to be administered by the Sand City Planning, and Police Departments, with contracted biological services for species and habitat evaluation.

7. Recognizes the enhanced habitat area (7.4 acre) at the Sand Dollar Shopping Center as a pre-mitigation measure and it use as major stepping stone connector to the corridor system.

8. Recognizes the California State Parks and Recreation land holdings south of Bay Avenue, and wiil require these area to be enhanced and restored for appropriate habitat.

1.7 Proposed Habitat Conservation Plan Elements

The following are the key elements of the Proposed HCP. Refer to Chapter 4 for specific details on plan implementation.

1. Stepping Stone Habitat Areas

   a. Secure and create a "Stepping Stone" pattern of habitat areas of sufficient size for Smith's blue butterfly to use as dispersal corridors so that natural biological processes for that species survival can eventually occur without human interaction and management. Stepping stone habitat areas would be created in the following areas as shown in Figure 2:

      o the Sands of Monterey site, Area M/N on Figure 2 (as a condition of project approval),

- o on the West side Highway 1, State and Regional Park lands, Areas D and E on Figure 2 (as a condition of project approval),
- o north of Playa Avenue area, Area S and Q on Figure 2 (as a condition of project approval)
- o at the Sand Dollar Shopping Center mitigation area, Area U on Figure 2 (existing)
- o at the East Dunes high density area, Area W on Figure 2 (as part of specific plan and condition of Planned Unit Development approval)
- o where appropriate, at each project site on the west side of Highway One at areas D, E, F, G, I, J, and M.

2. Corridor Creation and Gene Dispersal

a. East-side Corridor: Focus primary Smith's blue butterfly corridor and habitat preservation on the east side of Highway 1; extending corridor north and south through the "East Dunes". West side habitat corridor will also be planted to attract Smith's blue as part of the Highway 1 ROW planting and use of habitat set-aside on both public and private property.

b. West-side Corridor: Utilize Caltrans and Sand Dunes Drive (existing and proposed) right-of-way for re-vegetation to native, maritime chaparral corridors, funded through the Caltrans Environmental Enhancement Program and other programs.

c. Require that the Sands of Monterey site on the northern most end of Sand City to connect to adjacent habitat on Fort Ord for continuing dispersal to north (Figure 2, Area N).

d. Provide for possible dispersal to the south from Sands of Monterey site via Highway 1 west side corridor and east side corridor (Figure 2, Area N and P).

Smith's blue dispersal to the south will be along the Highway 1/Sand Dunes Drive ROW corridor, however dispersal is constrained on the west by lack of existing habitat and high winds (there have been no observed Smith's blue butterflies); freeway underpass is possible constraint to dispersal to the east side corridor although high density habitat creation in the right-of-way and underpass area would provide opportunity for butterfly activity (Figure 2, Area P).

e. Increase the possible dispersal of Smith's blue along the east side corridor from the Sands of Monterey site

and the Fort Ord colony, through the underpass by including high density habitat and certain kinds of high intensity lighting, which will be tested and utilized to simulate day light environments (Areas Q, R, O, and X on Figure 2). This will create an opportunity for Smith's blue to extend their range to the larger more desirable habitat on the east side of Highway 1.

f. Collection and Relocation of Smith's blues butterfly: To further encourage and promote gene dispersal north and south through the City along the east side habitat areas and corridors, a program for collection of butterfly larvae will be instituted as part of the Proposed HCP.

Guidelines will be utilized similar to those provided by HLA Associates for the Sand Dollar Shopping Center Phase II HCP. All work will be performed by a qualified biologist in accordance with conditions of a federal 10(a) permit and a state Scientific Collector's Permit.

g. In addition, with approval from the USFWS, the Proposed HCP will institute a program of Smith's blue butterfly capture and transplant from the Fort Ord colony to the existing populations on the east side populations at North of Playa, Sand Dollar, and East Dunes corridor.

3. Development in the East Dunes

a. Provides for high density residential planned unit development (PUD) in the East Dunes (Area V on Figure 2)

b. Creates habitat corridor to connect to Sand Dollar Shopping Center to the north, extending south along Caltrans ROW and 100' strip adjacent to ROW, to the Seaside city limits (Area W on Figure 2).

c. Addresses the development goals of the City and follows the Certified Local Coastal Plan for housing and commercial development on both sides of Highway 1;

4. Development on the West Side of Highway 1

a. Conditions "west side" public and private development projects for establishment of frontal and rear dune in native habitat where appropriate in required erosion setbacks and along Sand Dunes Drive alignment.

b. Standards for each property established by the City as a condition of project approval

1.8 Conservation Parameters of the Proposed Habitat Conservation Plan

The City's believes that the Proposed Habitat Conservation and Land Use Plan represents the most practical effort for the City and the property owners in Sand City for conservation of endangered and native plants and species. The Proposed HCP represents a model example of how a small urban city (350 acres), with surrounding intensive commercial and industrial uses, can conserve endangered habitat and still provide housing and moderate growth.

Conservation in Sand City means:

1. Creation of New Habitat:

   In area of extensive sand mining, where native plants have been eliminated, the Proposed HCP will condition future projects, both public and private, to restore the area to appropriate native dune habitat. This will be a planting program to promote natural dune environments and could assist in the dispersal and gene flow evolution for the Smith's blue butterfly. See Figure 2 for area of new habitat creation.

2. Preservation of Existing Habitat:

   Existing buckwheat and dune gilia plants will be preserved by the approval of this map (except in the East Dunes take area), and will then undergo extensive restoration and enhancement.

3. Restoration[1]:

   Many native plant areas in Sand City have been neglected and the Proposed HCP will provide a program for removal of invasive plants such as iceplant. This plant is wide spread and has continued to threaten the survival of the dune gilia and both species of buckwheat. Industrial and commercial activity combined with past sand mining and increasing public recreation has resulted in severe damage to native and endangered plants.

   The Proposed HCP will continue the successful restoration efforts which the City initiated with the Sand Dollar Shopping Center. More than seven (7+) acres has been seeded and planted with native plants and buckwheat and the effort is anticipated to yield strong evidence of Smith's Blue

[1] See Appendix A for a report on Sand City Dune Restoration Techniques, prepared by Pacific Open Space, August 9, 1989. The report describes appropriate restoration techniques for dune environments, and restoration prescriptions for areas within Sand City.

butterfly survival and rare and threatened plant resurgence.

4. Enhancement:

Areas of existing plants will be enhanced with plantings of associate native plants to re-create the most appropriate system of dune, maritime, and coastal habitat systems. This was done at the Sand Dollar site, and is proposed for the Sands of Monterey site, and the area north of Playa Avenue which is in the Sand Dollar Phase II area.

1.9 Key Advantages of the Proposed HCP for USFWS

Considerations or mitigation for "take", as proposed in this HCP has several destint advantages for the USFWS and other agencies concerned with rare, threatened, or endangered species. Please refer to Figure 2 and the map annotations for references to areas discussed..

1. The most obvious gain for habitat conservation, even with take in the East Dunes, is the extensive additional areas of officially designated and protected habitat areas that will occur in the City. An estimated 50+/- acres of private and city public land will be conserved for an estimated 13+/- acres of take.

   The HCP will also designate state and regional park land to be part of the habitat stepping stone and corridor system. This will include an estimated 20+/- acres of state parks and regional park's land holdings west of Highway 1.

   This brings the protected and enhanced habitat area to over an estimated 70 acres (6:1 ratio). (As noted earlier exact acreage figures and locations will be finalized after negotiations with the Service. All figures at this point are approximations.)

2. Equally obvious is the prevention of the on-going deterioration of the native and endangered habitat that is occurring from invasive iceplant and human activity (recreational, commercial, industrial, trash, and garbage discards). This will continue to go on without the Proposed HCP and could mean the eventual elimination of the buckwheat habitat for the Smith's Blue butterfly and reduction of dune gilia populations in Sand City.

3. The Proposed HCP will enable conditions for public and private developments west of Highway 1 which will create frontal and rear dune habitat conservation (Figure 2, Notes "D, E, F, I, and J"). In the area where State Parks and the Regional Park District own property (Figure 2, Notes "D and E"), priority will be given to preserving and restoring habitat and promoting passive open space with educational and interpretive signage. The HCP includes this land as

mitigation for "take" by requiring state and regional parks to use this area for habitat revegetation and enhancement and not for active public recreation which would eliminate this area for habitat conservation.

The HCP component for habitat set-aside, as a condition of development project approval, is a way to achieve habitat conservation and long term maintenance of habitat with reduced costs to the City and other public agencies.

4. The City will restrict, by virtue of the Proposed HCP, active recreation in sensitive habitat areas and allow public access through defined board walks and supervised educational and nature groups. This will prevent the need for massive parking lots and other recreational encouraging activities from sensitive areas, keeping such activity in the State Parks area near the Monterey Beach Hotel.

5. Beside protecting and promoting restored habitat in these areas, educational signage and limited access will be promoted in development project conditions in areas both west and east of Highway 1.

6. The widening of Sand Dunes Drive and the creation of a bike path will add five additional feet of habitat along the road. This will promote passive recreation along the Drive and keeping active recreation away from the rare and endangered species.

7. The City is in the process of applying for several State funded grant programs related to habitat conservation. One is the Caltrans "Environmental Enhancement Mitigation" and another is the Habitat Conservation Fund from the State Parks and Recreation. This will provide funding for planting of additional areas appropriate for rare and endangered plants.

   These funds will assist in acquistion (fee or conservation easements), construction, and long-term management of habitat corridors and stepping stone areas. In addition, these funds can be used for resource conservation and dune stablization along the new Sand City bicycle trail. Dune stablization can utilize native planting which can encourage re-establishment of rare and endangered species.

8. On the east side of Highway 1 the right-of-way (ROW) corridor will be combined with private development habitat set asides and corridors through the Ord Avenue/Highway 1 interchange, the four acre north of Playa Avenue habitat area, the seven acre Sand Dollar habitat area, the East Dunes corridor, and the southern extension of the corridor.

9. Educational signage and public awareness will be part of all public and private developments as a condition of project

approval including observation platforms, protective boardwalks, restrictive areas, seasonal information and restrictions.

10. Funding: funds from private landowners will be collected by one or more of the following methods: a benefit assessment district, joint venture agreements, MOU's, deed restrictions, and/or conditions of project approval. The Proposed HCP will condition project developments for payment of habitat fees, and create an on-going Habitat Maintenance District (HMD) as long as necessary to secure viable populations of habitat and Smith Blue butterflies until an area can be naturally self-sufficient. The mitigation fee and fund will be structured to create a yearly budget for long-term (in perpetuity) intervention for species survival. See Section 4.0 for further discussion on funding implementation.

2. BIOLOGICAL ISSUES

2.1 Vegetation Communities

Sand City is built on the Monterey Bay dune system, which extends from north of Monterey harbor northward to just beyond the Salinas River mouth in Monterey County, California. The system is comprised of three dune types defined by their geologic age: 1) recent dunes, formed from recent alluvial depositions of the Salinas and Pajaro Rivers, 2) Flandrian dunes formed and stabilized during the Wisconsin glaciation, and 3) pre-Flandrian dunes formed and stabilized before the Wisconsin glaciation (Cooper 1967, Pavlik, 1980).

The dune system in Sand City has been severely degraded by sand-mining, the spread of ice plant, and through urbanization. These effects have left very little dune vegetation in Sand City. Figure 3 shows areas both of disturbed and vegetated dunes.

The pre-Flandrian dunes support a restricted and rapidly disappearing habitat type known as maritime chaparral (Griffin, 1978). Many rare, threatened and endangered (RTE) plant species are endemic to maritime chaparral, including two of the species found during this survey. There are other RTE plant species that occur on the recent and Flandrian dunes as well (Zoger and Pavlik 1987).

2.2 Rare Plants

There were three RTE plant species found in the eastern parcel of Sand City: sand mat manzanita (Arctostaphylos pumila Nuttall), Ceanothus rigidus Nuttall and dune gilia (Gilia tenuiflora Benth. ssp. arenaria (Benth.) A.& V. Grant) (Figure 3).

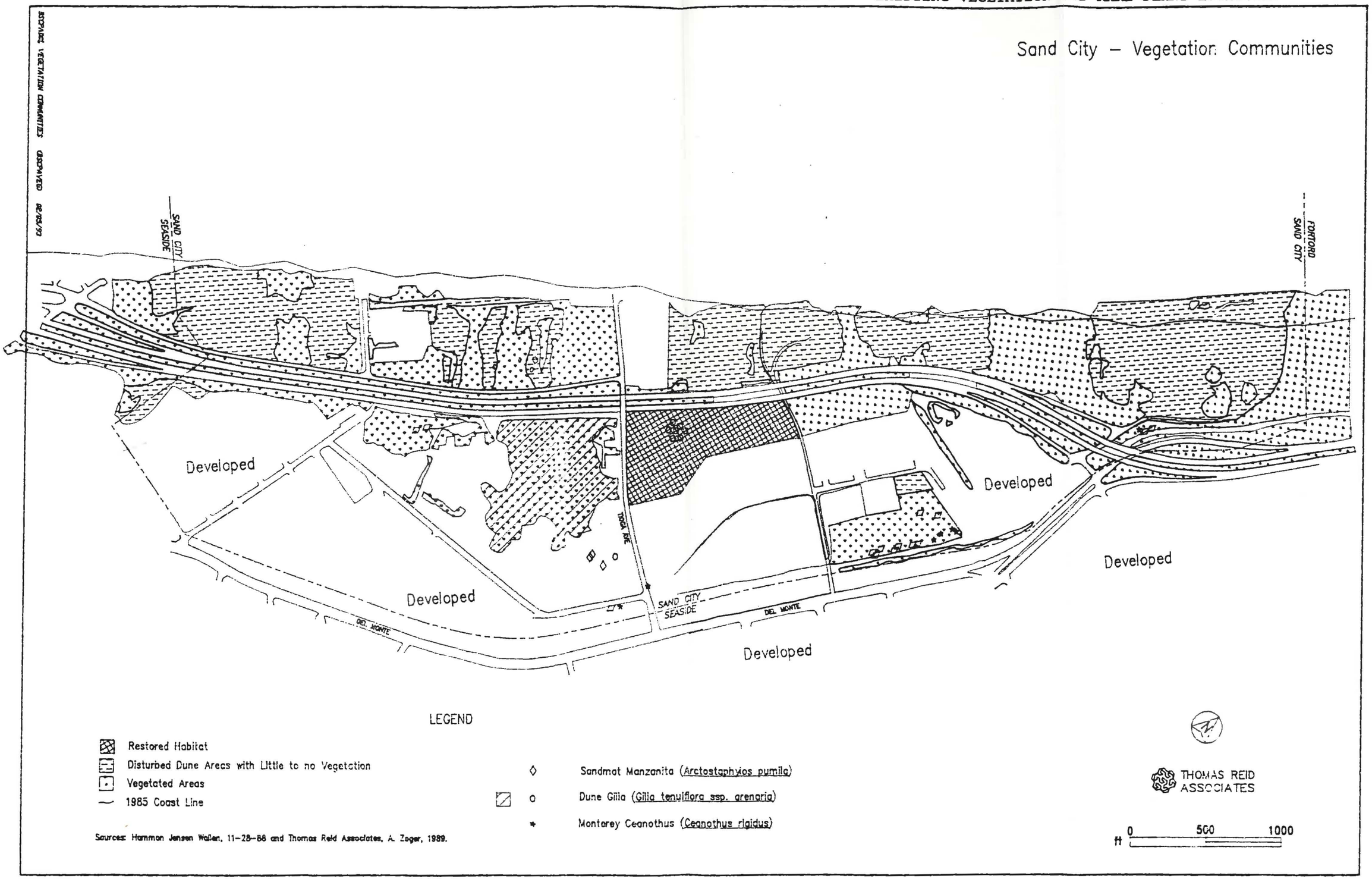
Using the habitat requirements of each taxon and information from institutions and individuals, known populations and new populations of Arctostaphylos pumila, Ceanothus rigidus and Gilia tenuiflora ssp. arenaria were located and described in 1987 and reconfirmed in 1989. Both the previously known and the new populations are shown in Figure 3.

In addition two other plants have the potential to occur in Sand City, the Monterey spineflower (Chorizanthe pugens var pugens) and Eastwood's golden fleece (Ericameria fasciculata).

2.2.1 Dune Gilia

Dune gilia (or sand gilia) (Gilia tenuiflora ssp. arenaria) is an annual that occurs on Flandrian dunes from just north of Monterey Bay harbor to just north of the Salinas River mouth (Zoger and Pavlik 1987). It is limited to the Monterey Bay dunes. There are six recorded major populations scattered up and down Monterey Bay.

FIGURE 3 -- EXISTING VEGETATION AND RARE PLANT LOCATIONS



In March 1991 the dune gilia was proposed for listing as endangered by the U.S. Fish and Wildlife Service. The USFWS published a notice of the proposed rule in the Federal Register on March 22, 1991 (Vol. 56, No. 56). In June 1992 the dune gilia was added to the federal endangered species list. The federal register notice lists the following threats to the species survival:

- The construction of a golf course at Spanish Bay eliminated a portion of the population in 1987.
- Populations on state lands are threatened by illegal off road vehicle use and trampling by hikers and equestrians.
- Urban development at Marina, Seaside and Sand City threaten populations in those areas.

In the spring of 1992, surveys for dune gilia were performed at Fort Ord for the U.S. Army. Preliminary results of those surveys indicate that there is a relatively large population of dune gilia at Fort Ord (Jack Massera, pers. comm., 5/21/92). Published results of the surveys will not be available until late in 1992. Previous to the studies at Fort Ord, the Sand City population of dune gilia was the largest recorded population.

Rare plant surveys performed in Sand City in 1987 found two separate gilia populations there. The two populations comprised a total of 5,090 individuals with a density of 0.391 per square meter (m2). 1986-87 was a particularly dry year, thus only 0.37% of the population was still flowering, with 99% of the population senescent at the time of the survey (late May 1987).

Because most botanists use the bright purple flower as a search image for this species in the field, and very few of the individuals were still in bloom, it is likely that the 1987 census underestimated the size of the population. In addition, the poor rainfall year would have resulted in a smaller population of this annual species because many seeds in the seed bank probably remained dormant. As of result of the poor year in 1987, the gilia populations were resurveyed in April 1989.

During the April 1989 survey, the population found in the East Dunes area was estimated to contain roughly 34,650 individuals with a density of 3.08 plants per m2. The second population, located on the Monterey Sand property north of Tioga Road, consisted of about 70 individuals in 1989.

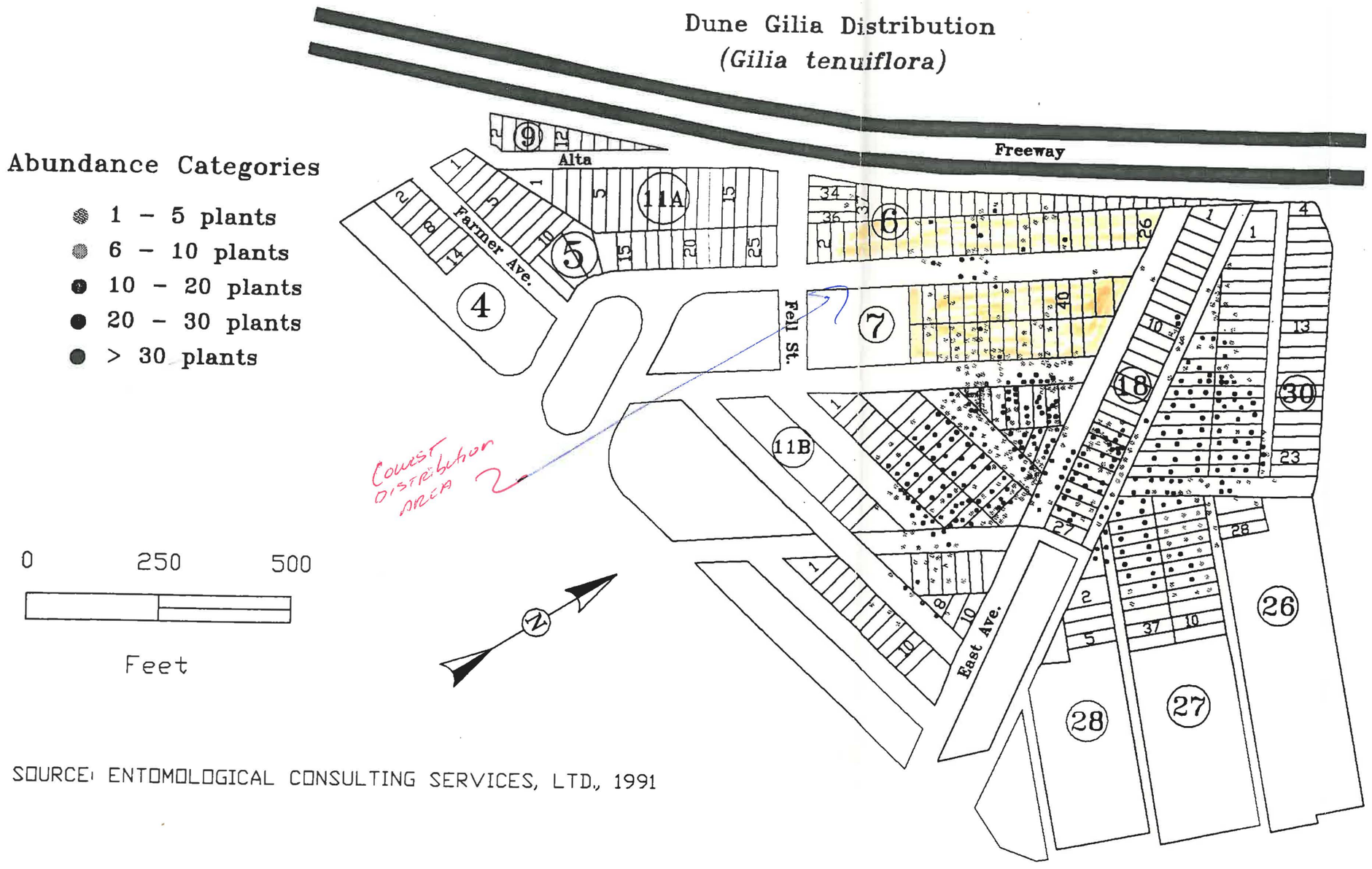
In 1991, Richard Arnold, Ph.D. conducted a survey of the dune gilia at the East Dunes for the City of Sand City. Dr. Arnold counted 11,743 plants in the East Dunes as compared to 75 plants in the Sand Dollar Phase I mitigation area (see Figure 4). Refer to the full report "Habitat Assessments for the Endangered Smith's Blue Butterfly and Candidate Monterey Bay Dune Gilia in

FIGURE 4 -- DISTRIBUTION OF DUNE GILIA AT THE EAST DUNES -- 1991

EAST DUNE STUDY SITE

Dune Gilia Distribution

(Gilia tenuiflora)



SOURCE: ENTOMOLOGICAL CONSULTING SERVICES, LTD., 1991

Sand City, California", for more details. The continuing drought conditions in 1990 and 1991 probably resulted in the decline of the gilia population in the East Dunes from what it was in 1989.

2.2.2 Sandmat Manzanita

Sandmat Manzanita (Arctostaphylos pumila) is a low growing shrub that characteristically occurs on pre-Flandrian dunes in maritime chaparral around the Monterey Bay (Griffin, 1978). In 1987, 1988 and 1989, sandmat manzanita was found in the eastern parcel of Sand City in an area that had been disturbed by sand mining in the past. There were also a few outlying individuals found growing in other open areas of Sand City (see Figure 3). In 1987, A total of 51 individuals were counted, and the population had a density of 0.017/m2. Of the total 3,000 m2 area that A. pumila occupied, A. pumila contributed 45.7% cover. The population was in good condition with no apparent disease or insect damage. The population of sandmat manzanita found in Sand City is not associated with a maritime chaparral community (Harding Lawson, 1991). It is found in a relatively flat, wind protected area on land that had been historically sand mined. There is a relatively large population of this plant at Fort Ord (Jack Massera, pers. comm., 5/21/92). Published details of the sandmat manzanita population status at Fort Ord will be available in late 1992.

2.2.3 Monterey Ceanothus

Monterey ceanothus (Ceanothus rigidus) is a large shrub that is found on pre-Flandrian sand hills and flats within maritime chaparral in the Monterey Peninsula (Griffin, 1978). In Sand City in 1987, a total of 113 individuals were counted, with a density of 0.038/m2 (see Figure 3). Of the total 3,000 m2 area that C. rigidus occupied, C. rigidus contributed 3.5% cover. Several of the individuals had unidentified caterpillars on their branches and leaves. No serious damage due to these or any other insects was observed. As with the sandmat manzanita, the Monterey ceanothus is not associated with a maritime chaparral community in Sand City (Harding Lawson, 1991). Monterey ceanothus is found in maritime chaparral plant communities at Fort Ord (Jack Massera, pers. comm., 5/21/92).

2.3.4 Monterey Spineflower and Eastwood's Golden Fleece

Chorizanthe pungens var. pungens (Monterey spineflower)

Chorizanthe pungens var. pungens has been found as close to the ocean as the strand and as far inland as the pre-Flandrian dune surface. It is associated with many different species, including Ambrosia chamissonis, Artemisia pycnocephala and Ericameria ericoides. It has a wide habitat range and tends to occur on bare sandy patches where there is not much vegetation cover (V. Yadon, personal communication, 5/87). The Monterey spineflower is proposed for listing as an endangered species by

the U.S. Fish and Wildlife Service. It is ranked by the State as very threatened and is on CNPS list 1B with a rare, endangered, distribution code of 3-3-3. This code designation means the plant has a limited occurrence, is endangered throughout its range, and is endemic to California.

In addition, there are two other species of Chorizanthe found in the coastal area of Monterey County, C. cuspidata and C. diffusa. These are very similar in appearance to C. pungens var pungens. These three can be easily mistaken for each other in the field and can only be distinguished by careful examination using a dissection microscope. Notes from the 1987 botanical surveys conducted in Sand City by Zoger and Pavlik indicate the presence of Chorizanthe cuspidata at Sand City. C. pugens var pugens was not noted on the species list.

Additional studies should be conducted in the spring to verify the species of Chorizanthe at Sand City and to map the distribution of any C. pugens var pungens found.

Eicameria fasciculata (Eastwood's golden fleece)

Eastwood's golden fleece is on the CNPS List 1B, and has a rare, endangered, distribution code of 3-3-3. This code designation means the plant has a limited occurrence, is endangered throughout its range, and is endemic to California. It is currently a Federal Candidate species, category 1. The plant is typically associated with Maritime chaparral plant communities. According to the 1988 CNPS Inventory the plant is threatened by development and disturbance.

The 1987 plant survey performed by Pavlik and Zoger noted Ericameria ericoides on the eastern side of the City. No E. fasciculata was noted on the plant list. Studies should be conducted in the spring to verify the species of Ericameria found in Sand City. Any E. fasciculata discovered should be mapped.

2.3 Smith's Blue Butterfly

2.3.1 Background

Smith's blue butterfly (Euphilotes enoptes smithi) is found along the coastal dunes of Monterey County north from Marina Dunes, south to Point Gorda. More inland populations are found in Carmel Valley. The larvae (caterpillar form) feed on two species of buckwheat: the seacliff buckwheat, Eriogonum parvifolium, used to the south, and the coast buckwheat, Eriogonum latifolium, used in the north. While the overall distribution of Smith's blue is smaller than the geographic range of its larval food plants, Sand City is clearly within the present range of the butterfly.

Several surveys of the federally listed endangered Smith's blue butterfly were performed at Sand City in the past few years

including those by Thomas Reid Associates (TRA) in 1987, Kellner in 1988, and Arnold in 1991. Results of those surveys are discussed in separate reports prepared by each author (see reference section). Below is a summary of the result of the various studies.

2.3.2 Description of the Butterfly

Smith's blue is a small lycaenid butterfly. The adults have a 1 inch wingspan. The wing has a pale grey underside speckled with black dots and a reddish-orange band on the hind-wing border. The topside of the male is a lustrous blue, the female has a brown topside with a band of orange bordering the hind wing (1984 Smith's Blue Recovery Plan). Larvae are slug-shaped and vary from in color from cream to pale yellow or rose, changing with the color of the flowerheads on which they are feeding.

2.3.3 Subspecies Relationships

The species Euphilotes enoptes comprises nine described subspecies, including Smith's blue (Euphilotes enoptes smithi). The following paragraph is a general introduction to the species biology adapted from Langston (1975).

The species group distribution is restricted to western North America, Western Canada and Baja California. Adults are closely associated with their host plants, several species of wild buckwheat, Eriogonum (Polygonaceae). Eggs are deposited on late buds or early flower heads of the buckwheat plants. Young larvae feed solely on the flowerheads of the plant. Each subspecies is generally restricted to one or a few closely related host species of buckwheat. There is only one generation per year. Depending upon subspecies, the adults may fly in early-late spring, summer, or early fall.

Smith's blue was originally described in 1954 by R.H.T. Mattoni from specimens collected on 20 Aug. 1948 at Burns Creek, State Highway One, Monterey County, California. Dr. Jerry A. Powell found many along Tioga Ave. south of Fort Ord (in the Seaside Dunes) on 4 July 1959. Robert Langston confirmed it at the Seaside Dunes (later Sand City) in 1962, 1963, 1969, 1971, 1986 and 1987.

Two other subspecies of Euphilotes enoptes are found in the greater San Francisco Bay Area. E. e. bayensis is found in the northern San Francisco Bay area: including Marin, Contra Costa, and Solano Counties, ranging northward in Sonoma, Mendocino and Humboldt Counties. E. e. tildeni is also more widespread than smithi: it occurs in the inner coast range foothills and mountains in Santa Clara, Stanislaus, San Benito, Monterey, San Luis Obispo, Kern and Ventura Counties.

The most recent distribution of Smith's blue is described in the U.S. Fish and Wildlife Service (USFWS) Smith's Blue Butterfly

Recovery Plan (1984). The Plan lists 21 Smith's blue butterfly collection localities and threats to the habitat at each location. The coastal localities extend north from the Salinas National Wildlife Refuge south to Point Gorda. The Sand City site is described in the Recovery Plan as being threatened by iceplant and unrestricted foot traffic. See Section 3.1.2 for more discussion of the Smith's Blue Butterfly Recovery Plan.

2.3.4 Life Cycle

The following is summarized from the Smith's Blue Recovery Plan (USFWS 1984). Smith's blue butterflies are univoltine -- there is only a single generation per year. The butterflies overwinter as pupae, emerging as adults in the late spring or early summer. The males emerge a few days to a week ahead of the females. Once the females emerge, they are quickly mated. All courtship and mating behavior takes place around the buckwheat plants.

The females lay their eggs singly on flower heads of the plants. The larvae hatch in about a week. After hatching the larvae begin eating the flowering heads of the buckwheat. As larvae grow they molt, passing through 5 growing stages (or instars). Following the fifth instar stage the larvae pupate (August - November), and then overwinter in the leaf litter at the base of the plants.

2.3.5 Larval Food Plants

Smith's blue is known to use two buckwheat species as larval food plants: seacliff or dune buckwheat, Eriogonum parvifolium, and coast buckwheat, Eriogonum latifolium. In California, Eriogonum parvifolium is found in dunes and hillsides along the California coast from Monterey County south to San Diego County (Abrams, 1944). Sand City is near the northern range limit for Eriogonum parvifolium and the butterfly. The dune buckwheat is a shrub with slender leafy branches. It has a single inflorescence; the flower is white aging to a pale rose color. Eriogonum latifolium is found in bluffs and dunes along the coast from Oregon south to San Luis Obispo (Munz 1968). It has mostly basal oval leaves and also has a single white or pale rose inflorescence.

2.3.6 Oviposition Suitability

Female butterflies lay their eggs singly on the buds and newly opened flowering heads of buckwheat. Because the plants bloom earlier in the more sheltered aft dunes, the earliest emerging adults are found flying in these locations. The adults subsequently emerge in the mid dunes, and ultimately in the more exposed areas of the fore dunes.

2.3.7 Nectaring

Adult Smith's blue butterflies nectar (feed) almost exclusively on buckwheat flowers. Under inclement weather conditions when butterflies do not get sufficient warmth from sunlight to allow flight, adult feeding is also curtailed.

2.3.8 Interaction with Other Animal Species

There are several species of lepidoptera which also feed on buckwheat species at Sand City: the Mormon metalmark (Apodemia mormo), the green hairstreak (Callophrys viridis), the acmon blue (Plebejus acmon), and the common hairstreak (Strymon melinus pudica). These species overlap in flight period with Smith's blue. The extent of larval competition among these species is not known, however, due to the abundance of buckwheat relative to the distribution of the butterfly at Sand City, competitive exclusion among the species is not likely to occur across large portions of the habitat.

As with other lycaenids, Smith's Blue larvae appear to be tended by ants during later instars (Arnold 1980). Arnold also observed predation by spiders and occasionally heavy parasitism by wasps. The role of other species in Smith's blue population dynamics is unknown.

2.3.9 Dispersal and Barriers to Movement

Smith's blue is a weak flying species and long distance dispersal is certainly extremely rare. Mark-release-recapture studies are required to demonstrate actual movement of individuals and were not done for the Sand City study. Arnold (1983) examined Smith's blue at Fort Ord and at the Marina State Beach (1986), reporting common dispersal of distances of a few hundred yards. Flight usually occurs within one or two meters above the ground. Observations of extended flight -- more than a few minutes for an individual butterfly -- are rare.

Since Smith's blue spends the majority of its time in short flights within patches of buckwheat, any area of non-habitat, such as active mining areas, large blow-outs, or extensive dense patches of vegetation which does not contain buckwheat (such as ice plant), will act as barriers to dispersal. Where there is no visual continuity of habitat, as with areas of urban development or plantings of shrubs or trees, the barrier is likely to be significant. Some dispersal may be passive, by the wind, but the typical response of adults under high wind conditions is to avoid flight altogether.

2.3.10 Smith's Blue Host Plants at Sand City

The distribution of Eriogonum parvifolium and E. latifolium were mapped in 1987 by Thomas Reid Associates (TRA), in 1988 by LSA Associates, in 1989 by TRA, and in 1991 by Arnold. The results of the host plant mapping is shown in Figures 5 and 6. The Smith's blue has been observed to utilize both host plants at Sand City (Arnold, Kellner, Langston) so that the combined distribution of both plants defines the extent of the butterflies existing habitat area in Sand City.

The 1991 Arnold study also provided density estimates for the host plants at the East Dunes and included comparisons of those densities with densities found at the Marina Dunes and at Fort Ord. The study stated that densities of both buckwheats and their flowering stalks are substantially lower in Sand City than at the high quality habitats at Fort Ord and Marina State Beach. Dr. Arnold also expressed in the report, that habitat quality in Sand City could be considerable improved with proper management and revegetation.

2.3.11 Smith's Blue Adults at Sand City

Data collected on the adult distribution of Smith's blue butterfly in Sand City in 1987 by TRA and 1988 by Kellner indicate that the butterfly is associated with all major patches of Eriogonum found there. Small isolated patches of Eriogonum (less than 10 or so plants) did not appear to support the butterfly. The density of Smith's blue butterfly at Sand City identified from the 1987 and 1988 surveys is shown in Figure 5.

Arnold conducted an adult Smith's blue survey of the East Dunes between July 18th and August 29th 1991. A total of 172 Smith's blue butterflies were observed on seven days. The results of that study are provided in his report "1991 Monitoring Studies of the Endangered Smith's Blue Butterfly at the East Dunes Area of Sand City, California".

2.3.12 Habitat Requirements for Species Conservation

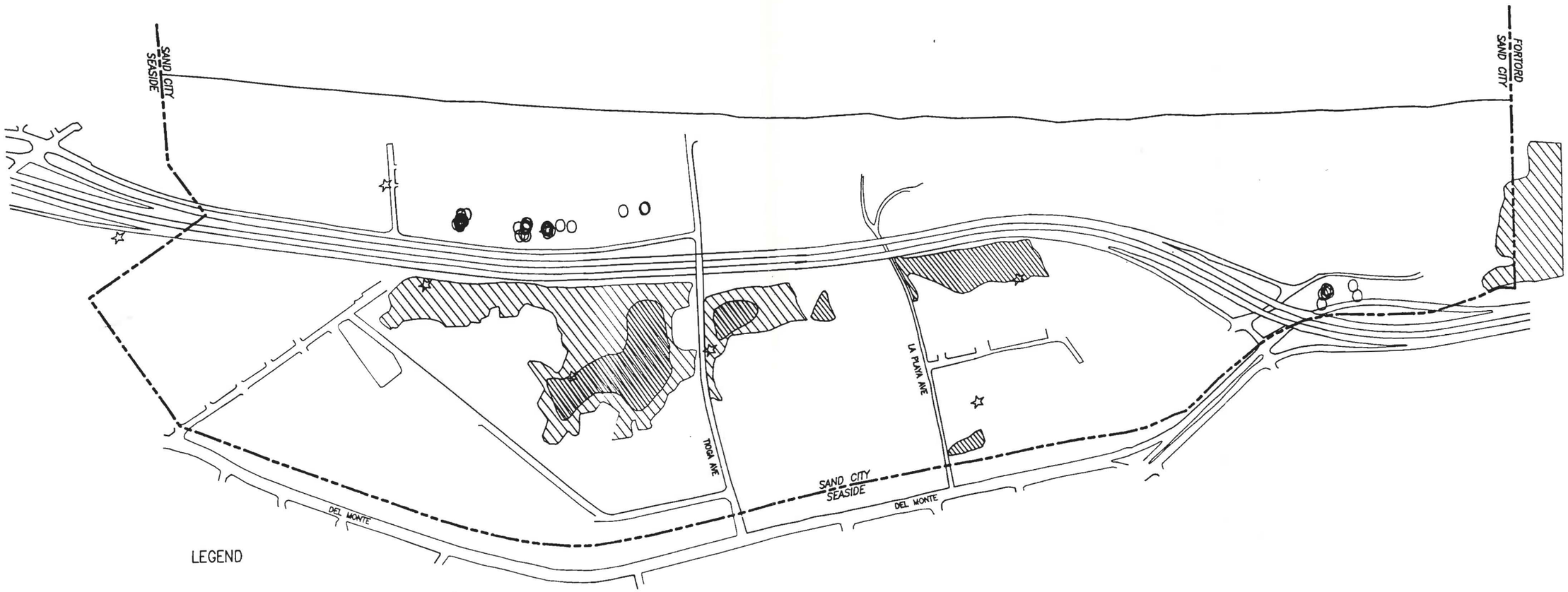
a. Objectives

The population of Smith's blue at Sand City is only a small part of the entire population. As such, whatever conservation is achieved at Sand City will affect and be affected by conservation efforts elsewhere in the butterfly's range. With minor updating for recent studies, the U.S. Fish and Wildlife Recovery Plan is a good guide to the sort of range-wide protection that would be appropriate to maximize the long term survival of Smith's Blue. Refer to Section 3.1.2 for further discussion of the Smith's Blue Butterfly Recovery Plan.

In considering what conservation objectives are appropriate for the Sand City population of Smith's blue, it is important to

FIGURE 5 -- SMITH'S BLUE BUTTERFLY AND BLACK LEGLESS LIZARD

Sand City – Smith's Blue Butterfly and Black Legless Lizard



LEGEND

- ○ Scattered Buckwheat Plants with no Butterflies Observed
- ☆ Black Legless Lizard, 1989
- ▨ Smith's Blue Butterfly (Euphilotes enoptes smithi) – High Density Habitat and Adu : Observations
- ▧ Smith's Blue Butterfly (Euphilotes enoptes smithi) – Low Density Habitat and Adu : Observations
- ~ 1985 Coast Line

Source: LSA Associates, Inc., Thomas Reid Associates, and Richard Arnold, Ph.D.

THOMAS REID ASSOCIATES

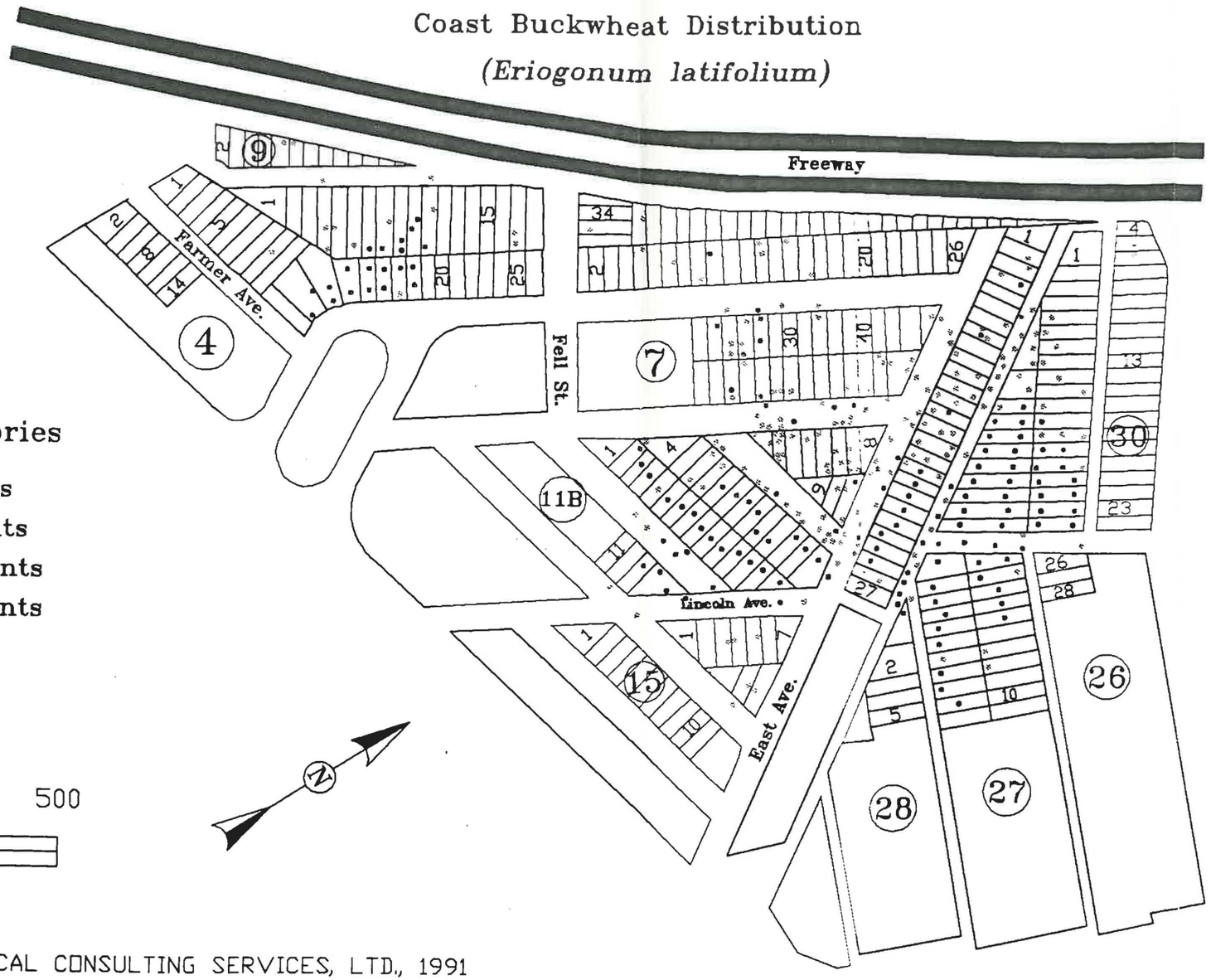
ft 0 500 1000

FIGURE 6 -- SMITH'S BLUE BUTTERFLY HOST PLANT DISTRIBUTION, EAST DUNES -- 1991

EAST DUNE STUDY SITE

Coast Buckwheat Distribution

(Eriogonum latifolium)



Abundance Categories

- 1 – 5 plants
- 6 – 10 plants
- 10 – 20 plants
- 20 – 30 plants
- > 30 plants

0 250 500

Feet

SOURCE: ENTOMOLOGICAL CONSULTING SERVICES, LTD., 1991

consider the proximity of this colony to other colonies, both to the north and south, and the need to maintain habitat dispersal corridors between the colonies. Because the Smith's blue butterfly habitat in Sand City is already so small and fragmented, it may not be practical to attempt to establish large preserves in this area. Instead it is more important to maintain and expand habitat corridors along the coast to encourage and facilitate dispersal between the coastal dune colonies. This is in fact one of the Recovery Plan objectives identified for this population (page 52).

b. Resource Quality Within Colonies

The quality of habitat for Smith's blue is similar over the Sand City study area. Most of the stands of the butterfly's host plants have already been invaded by ice plant or are threatened by invading ice plant. According to Arnold (1991) the density of buckwheat flowering stalks are much lower throughout Sand City than at known colonies at Fort Ord and the Marina State Beach.

Adult Smith's blue can find basic requirements (mating, nectaring, egg-laying) within a very small area (less than an acre). In locations where there is abundant host plant the local butterfly densities may vary from year to year, thus, Smith's blue "hotspots" may shift over a period of years -- partially in response to declining buckwheat quality (Arnold, 1980, 1986). The limited distribution and poor quality of host plants at Sand City has resulted in a limited distribution of Smith's blue.

c. Colony Extinction and Species Survival

The butterfly probably has a stepping-stone dispersal pattern, (Murphy 1986). Although few individuals travel substantial distances, individuals do leave colonies and disperse into adjacent unpopulated areas throughout the range of the butterfly. Surveys of Smith's blue habitat in its northern range (Salinas State Beach, Marina Dunes, Fort Ord and Sand City) in 1987 suggest that gene flow may be realized across the entirety of the butterfly's distribution along the coast of Monterey Bay.

Large, continuous habitat areas with high resource density are the areas of greatest habitat value. Small isolated areas, even with high resource density, may be unable to support Smith's blue butterflies in the long term. Even with high buckwheat density, small areas may not be able to support enough butterflies to avoid extinction due to random fluctuations in population size. While it is plausible that sufficient long-range dispersal (on the order of a mile) could accomplish recolonization and gene flow through the stepping stone model, the rate of recolonization may be too low to functionally sustain colonies at many of the isolated habitat patches noted along the dunes at Fort Ord, for example.

Large areas with low resource density may continue to support colonies of Smith's Blue if the resource density is above some critical value (not now known explicitly). Results from this study and others (Arnold, 1980, 1986) indicate that the flight behavior of Smith's blue is well adapted to exploit a host plant of moderate density with a patchy distribution on a small scale and which shifts in density and distribution over time.

2.4 Black Legless Lizard

2.4.1 Background and Life History

The black legless lizard (Anniella pulchra nigra) is a Federal Candidate Species, Category 1 and in 1992 it was proposed for federal listing. Substantial biological information to support a proposed listing is now being collected (California Department of Fish and Game Diversity Data Base, April 1986).

The black legless lizard has a limited range. According to Stebbins (1966), it is found only on the Monterey Peninsula and adjacent coastal sand dunes along the southern part of Monterey Bay. Intergrades between the black and silver legless lizard (Anniella pulchra) occur along Monterey Bay north of the Salinas River just into Santa Cruz County (Miller, 1943). Dark individuals from coastal San Luis Obispo County have in the past been tentatively referred to as intergrades (Stebbins, 1954). However, recent biochemical studies conducted at the University of California at Berkeley indicate that these populations are most closely related to the normal silver legless lizards that occur in other parts of central and southern California (William Rainey, pers. comm.). The dark coloration of the San Luis Obispo County population has evolved independently from silver legless lizards and has no relation to black legless lizards in Monterey County.

Historically, the black legless lizard had a continuous distribution along coastal sand dunes from the Salinas River to the Carmel River. However, habitat has been greatly reduced and fragmented by human activities. This habitat reduction is caused by urban development, vegetation destruction through human trampling and off-road vehicle use, sand mining, and the introduction of iceplant that forms large mats under which black legless lizards are not able to live (Bury, 1985).

Black legless lizards occur throughout the coastal dune system from above high tide line to the dune crests. They burrow in the sand and are found by raking in the leaf litter under native vegetation such as sagewort, lupine, and mock heather. Bury (1985) reported that 71% of the lizards he found were in association with mock heather and lupine. However, in 1985 at Spanish Bay on the Monterey Peninsula, we found over 70% under sagewort. At this site mock heather and lupine were not common.

Black legless lizards are relatively sedentary and populations occur even in small patches of natural habitat.

2.4.2 Black Legless Lizards at Sand City

In 1987, all the undeveloped areas within the Sand City limits were surveyed by Theodore Papenfuss, Ph.D. and Robert Macey to determine if black legless lizards were present. Lizards were located by digging with a rake under vegetation. Since this method has an adverse effect on the plants, no attempts was made to locate large numbers of black legless lizards. An attempt was made to find one individual at each separate undeveloped site. Lots were considered to be separate if they were surrounded by buildings or roads.

Areas of suitable habitat were mapped in the field based on the presence or absence of lizards. Habitat within the Study Area was mapped and rated according to its suitability for the black legless lizard. Areas considered unsuitable were those completely altered by sand mining, extensive off-highway vehicle use, and construction of buildings. Areas covered extensively by ice plant are considered poor habitat, because the ice plant's thick root system forms dense mats under which the black legless lizards are not able to live. Areas designated as good habitat were relatively intact dune systems containing both exotic and natural vegetation where lizards were found. No excellent habitat areas found in Sand City.

All areas containing potential habitat of the black legless lizard were surveyed in Sand City. Lizards were found in seven locations (Figure 4). A description of each habitat areas is described below.

1. The coastal dunes west of Highway 1, south of Fort Ord and north of Tioga Ave is considered poor habitat. No black legless lizards were found. This site has almost no native vegetation. There is a large mat of iceplant at the north end and the rest of the property has had extensive sand mining. This is within Planning Area C.

2. The coastal dunes west of Highway 1, south of Tioga Ave., and north of Bay Street is considered good habitat. Black legless lizards present. Habitat consists of some native vegetation, but mostly iceplant and open dunes.

3. The coastal dunes west of Highway 1, south of Bay Street, and north of the southern boundary of Sand City is considered good habitat. Black legless lizards present. The habitat is similar to site #2.

4. The lot between north end of Metz Road and railroad tracks is considered good habitat. Black legless lizards present. Habitat consists of native vegetation and isolated patches of iceplant. This is Area L on Figure 2.

5. The sandy slope west of site #4 and east of Highway 1 is considered good habitat. Black legless lizards present. Habitat consists of native vegetation and isolated patches of iceplant. This is Area S on Figure 2.

6. The lot between south end of Metz Road and railroad tracks is considered unsuitable habitat. Black legless lizards absent. Sand appears to have been removed. This is part of the Phase 1 Sand Dollar Shopping Center (Costco Store) which has been built.

7. The sand mine west of Metz Road and north of Tioga Ave. is considered unsuitable habitat. Black legless lizards absent. Most native vegetation gone and large patches of iceplant present. This is part of the Phase 1 Sand Dollar Shopping Center (Costco Store) which has been built.

8. The lot north of Tioga Ave., east of Highway 1, and west of site #7 is considered good habitat. Black legless lizards present. Habitat consists of native vegetation and isolated patches of iceplant. This is the Sand Dollar Phase 1 mitigation area, Area U shown on Figure 2.

9. The large lot south of Tioga Ave. and east of Highway 1 is considered good habitat. Black legless lizards present. Habitat consists of native vegetation and many patches of iceplant. This is the East Dunes area, area V on Figure 2.

10. The lot east of Highway 1 extending into Seaside from southern boundary of Sand City is considered good habitat. Black legless lizards present. Habitat consists of native vegetation and isolated patches of iceplant. This area is outside City limit line.

Because the black legless lizards are relatively sedentary, there is a need to maintain contiguous areas of suitable habitat to assure gene flow. Paved roads, buildings, and areas of bare earth are absolute barriers to the movement of black legless lizards. Small areas of suitable substrate without habitat may also limit movement.

Corridors of natural habitat connecting preserved habitat would allow for gene flow between the areas. It is possible that large culverts partially filled with sand or elevated roadbeds could allow lizard movement beneath roads. Alternatively, a long term habitat monitoring program could routinely move a few individuals between isolated habitat areas.

Restoration of disturbed areas to natural conditions could provide added habitat for black legless lizard populations. The lizards may be salvaged from suitable habitat areas which are being replaced by development, and relocated to restored habitat with well-established vegetation. However, threatened animals

should not be relocated to good habitat areas, where natural population densities are already established.

2.5 Dune Restoration

The following discussion of dune restoration is summarized from the report entitled "Sand City Dune Restoration Techniques" prepared by David Kaplow of Pacific Open Space, in August 1989. The full text of the report is contained in Appendix B at the end of this report.

Existing undeveloped land in Sand City consists of the following:

1. stable dunes with native annuals and decadent ice plant
2. unstable seaside dunes with little or no cover,
3. stable dunes dominated by vigorous ice plant,
4. pre-flandrian coastal terrace, and
5. railroad right-of-way.

There several restoration techniques available for use on these site conditions including use of hydromulching with seed, straw plugs with seed and container stock. Based on results of projects which are taking place in nearby areas (including Marina State Beach, Asilomar, and King Salmon), Mr. Kaplow recommends the following procedure for vegetation restoration at Sand City.

Each site should be prepared by killing or removing ice plant. Areas with large patches of ice plant can be treated with herbicides and left to die. Care should be taken in applying herbicides in any areas where Smith's blue butterfly host plants or rare plants occur near the target ice plant. Careful hand removal is more appropriate in these locations.

An appropriate plant palette should be developed for each particular site. Only native species indigenous to the area should be used. Seed collection and container plant establishment should sufficiently precede actual site restoration. If the soil nutrient is deficient some fertilizer may be needed. Nitrogen at a rate of 0.5-1.0 pounds per 1,000 square feet is recommended. A temporary irrigation system will help with quick plant establishment although timing planting with the wet season may eliminate the need for any irrigation.

Areas with little or no vegetation cover should be stabilized using hydromulching with seed. It is particularly useful in large areas and requires a minimal labor force. The planting of container plants should be used to fill in gaps left after the hydromulching. Container plants can also be used in small or remote areas which are not practical for hydromulching.

Once the plants have been established, continued maintenance is necessary to remove unwanted weeds and provide for species enrichment.

Experimentation with the propagation of the rare plants should take place early on so that the plants can be re-established in newly restored habitat areas.

Mr. Kaplow's report includes specific treatments for each site condition in Sand City, a list of appropriate species for use in restoration areas, and methods of introduction best suited for each species.

2.6 Status of Pre-mitigation Efforts at Sand Dollar and Other Sites

Detailed surveys taken on the habitat pre-mitigation area near the Sand Dollar Center have indicated that this is a very successful new habitat project. A survey conducted by Arnold, 1991, indicates that a total of 299 adult butterflies were observed, utilizing this newly created area of coastal habitat. Baseline surveys conducted in 1987 for Smith's blue butterfly indicate that 14 butterflies were observed in the Sand Dollar Pre-mitigation area.

This revegetated area (with both buckwheat plants and hydroseed) has far surpassed an older, "native" and mature habitat that is located in the East Dunes. The East Dunes is being degraded continually by invasive ice plant and adjacent human activity.

The daily index values at the Pre-mitigation area at Sand Dollar are 2 to 9 times greater than those at the East Dunes, as well as the seasonal average index, which is 2.4 times greater at Sand Dollar. This clearly proves the success of the City mandated pre-mitigation areas and establishes a base that new native coastal habitat environments can be created and enhanced. A copy of the 1992 survey in included as Appendix C in this report.

Other sites where restoration efforts have recently taken place include the area just south of the Monterey Beach Hotel, which was converted from a flat paved tank storage parking area into a sculptured dune and planted with native plants. This was done as mitigation for repair work on the regional sewer main. This area, even without extensive monitoring and maintenance, has blossomed into a successful dune and maritime plant community. It supports black legless lizard and Smith's blue butterfly.

2.7 Other Mitigation Efforts for Habitat Enhancement Approved by the U.S. Fish and Wildlife Service

Caltrans has proposed seacliff buckwheat plant propagation as mitigation for the incidental take of Smith's blue butterfly during construction of the Burns Creek Bridge Replacement project located along Highway One, south of Carmel. The mitigation plan calls for planting 2500 new buckwheat plants for the take of about 150 plants (this is a 15:1 plant/take ratio). A similar

approach to habitat mitigation could be used to mitigate incidental take in Sand City. A copy of the Caltrans report entitled "Propagation of Seacliff Buckwheat as Mitigation for the Burns Creek Bridge Replacement", Revised 1990, is included in Appendix D of this document.

3. EXISTING POLICIES CONCERNING RARE AND ENDANGERED SPECIES

The following Federal, State, and local policies work together to protect the biological resources found at Sand City, particularly rare, threatened and endangered species.

3.1 Federal

3.1.1 The Endangered Species Act (ESA)

The ESA is administered by the U.S. Fish and Wildlife Service, provides protection for the ecosystem upon which endangered and threatened species depend. The Smith's blue butterfly is a Federally listed endangered species which occurs at Sand City.

Section 9 of the Federal Endangered Species Act (ESA) prohibits the take of endangered species. Without a permit pursuant to Section 10 of the ESA, it is illegal for an individual or governmental entity to take or authorize an activity resulting in the take of a listed species. Thus, the City of Sand City cannot authorize, via grading or development permits, activities which would result in the take of listed endangered species. The conservation planning process by which a local land use authority, such as the City of Sand City, can legally allow development projects potentially resulting in take of such species is set forth in Section 10 of the ESA. This Section of the Act states that:

> "The Secretary (of the Interior) may permit any act prohibited in Section 9 for scientific purposes. The Secretary may also permit any taking of fish and wildlife if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

According to the ESA the Section 10(a) or incidental take permit application must be supported by a conservation plan that specifies:

1) the impacts likely to result from the taking,
2) measures to monitor, minimize, and mitigate such impacts,
3) funding to implement such measures,
4) alternative actions that would not result in taking,
5) reasons for not utilizing such alternatives,
6) responses to unforeseen circumstances, and
7) any additional measures, the Service may require as necessary or appropriate.

3.1.2 The Smith' Blue Butterfly Recovery Plan

As mentioned in Chapter 2 above, the USFWS completed a Recovery Plan for the Smith's blue butterfly in 1984. The primary objective of the "recovery plan is to prevent the extinction of the Smith's blue butterfly and to improve and maintain its status at a point where it can be safely delisted" (page 25). According to the recovery plan delisting can occur when 16 known sites have been secured. Downlisting from endangered to threatened would occur when 8 sites have been made secure. A colony is considered secured "when a viable, self sustaining population has been maintained at the site for a period of 5 consecutive years and no foreseeable threats to the future survival of the colony exist". Sand City is listed as one of the 15[2] sites which must be secured prior to delisting. However, the recovery plan allows the elimination of any one of the 15 sites if a comparable replacement site has been secured. Criteria for what constitutes a comparable site is described in the recovery plan (page 26).

Objective 4.1. of the recovery plan states "develop and implement management and land protection plans for the Phillips Petroleum, Sand City, and Marina sites" (page 33). Goals to be reached at each of the three sites listed above include:

4.1.1 Identify colonies and area necessary for their maintenance.
4.1.2 Control off-road vehicles.
4.1.3 Revegetate existing blow-out areas with native plants.
4.1.4 Control foot traffic on dunes by constructing boardwalks for beach access.
4.1.5 Remove exotic plants and replace with native plants.

According to the Recovery Plan:

> "small remnant colonies exist at the Phillips Petroleum site in Monterey and privately owned sites in Sand City and Marina. These sites may be critical for maintaining dispersal corridors among the coastal sand dune populations to permit genetic interchange. Because most of the historic coastal dune habitat in this area has already been modified or destroyed, the small remaining parcels are very important for the survival and recovery of the butterfly" (page 52).

[2] The Recovery Plan actually refers to and lists 18 sites, however, the USFWS determined in 1985 that the Santa Cruz and San Mateo County populations were not true E. e. smithi, so the 3 sites in those counties have been eliminated from the lists of areas to be secured.

The recovery plan realizes that these "additional sites needed for delisting may be more difficult to secure and manage because many of them are on private property and some have been proposed for future development" (page 52).

Since the recovery plan was drafted, the State Parks, in conjunction with the Coastal Conservancy, has acquired the Phillips Petroleum site, just south of Sand City.

An important new development that could dramatically benefit the Smith Blue butterfly recovery plan is the downsizing of the Fort Ord military base. Flora and fauna studies in support of developing a comprehensive re-use plan for the base, have shown new evidence of SBB and new habitat.

Preservation, enhancement and conservation of prime habitat in Ft. Ord may provide a more realistic and cost effective approach to enchantment of degraded habitat in Sand City, allowing a comprehensive "habitat mitigation banking" approach for incidental take in Sand City. See Section 5.0, Alternative # 4. for a full discussion of this more realistic approach to habitat conservation efforts in Sand City.

3.1.3 The National Environmental Policy Act (NEPA)

NEPA requires thorough documentation of a proposed project's impacts on the natural environment, and the identification of conflicts with the goals and policies of other governmental agencies. The preparation of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) is required to discuss need for the project, environmental impacts, and possible alternatives.

3.2 State

3.2.1 The California Endangered Species Act (CESA)

CESA provides policies to "conserve, protect, restore, and enhance any threatened or endangered species and its habitat and ... to acquire lands for habitat for these species." At Sand City there is one State listed threatened plant, the dune gilia (Gilia tenuiflora var. arenaria) - there are no State listed threatened or endangered animals. State agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered or threatened species.

The California Department of Fish and Game (CDFG), which enforces the CESA, may authorize individuals or public agencies to take or possess any state endangered, threatened, or candidate species for scientific, educational, or management purposes under Section 2018 of the CESA. A 2081 permit or MOU from CDFG may be required before the State would allow take of the dune gilia.

3.2.2 The California Native Plant Protection Act

This Act specifically pertains to the protection of rare and endangered native plants. In addition to the one state listed plant species found at Sand City, the dune gilia. There are also two CNPS designated rare plants, the sandmat manzanita (Arctostaphylos pumila) and Monterey ceanothus (Ceanothus rigidus). The intent and purpose of the Native Plant Protection Act is to preserve, protect and enhance endangered or rare native plants of the State. All state departments and agencies must consult with the CDFG to use their authority in furtherance of the purposes of the Native Plant Protection Act by carrying out programs for the conservation of endangered or rare native plants.

3.2.3 The California Environmental Quality Act (CEQA)

CEQA requires the preparation of an Environmental Impact Report (EIR) for any project which "has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory." A public agency should not approve a project which threatens a rare or endangered species unless there are no feasible mitigation measures or project alternatives identified in the final EIR.

3.2.4 The California Coastal Act

The Coastal Act requires that local land use agencies set forth specific policies related to the protection and conservation of rare and endangered species in their Local Coastal Plan. These policies provide for a more comprehensive approach to protection of habitat resources in the coastal zone than may be required by those of other agencies. This act requires that environmentally sensitive habitat areas be protected, and that development in areas adjacent to environmentally sensitive habitat will be sited and designed to prevent impacts which would significantly degrade such areas.

3.2.5 The California Department of Parks and Recreation (CDPR)

CDPR is also governed by directives approved by the Director of the California Department of Parks and Recreation (CDPR). Policies regulating development and management of State beaches have been set forth based on these directives. The objectives of these policies are to manage vegetation toward a natural condition, restoring native plant communities and protecting rare and endangered plants, while limiting the use of invasive non-native species in landscaping developed areas.

3.3 Local

3.3.1 The Sand City Local Coastal Program (LCP)

A large portion of Sand City is within an area regulated by the California Coastal Act (CCA). Lands within Sand City which are in the Coastal Zone are:

- all lands west of Highway 1,
- a 200 foot wide strip of land bordering the east side of Highway 1 along its entire north-south length, and
- a 100 foot wide strip of land on the western side of the Southern Pacific Railroad right-of-way, along its entire length.

Primary goals of the California Coastal Act (CCA) are to:

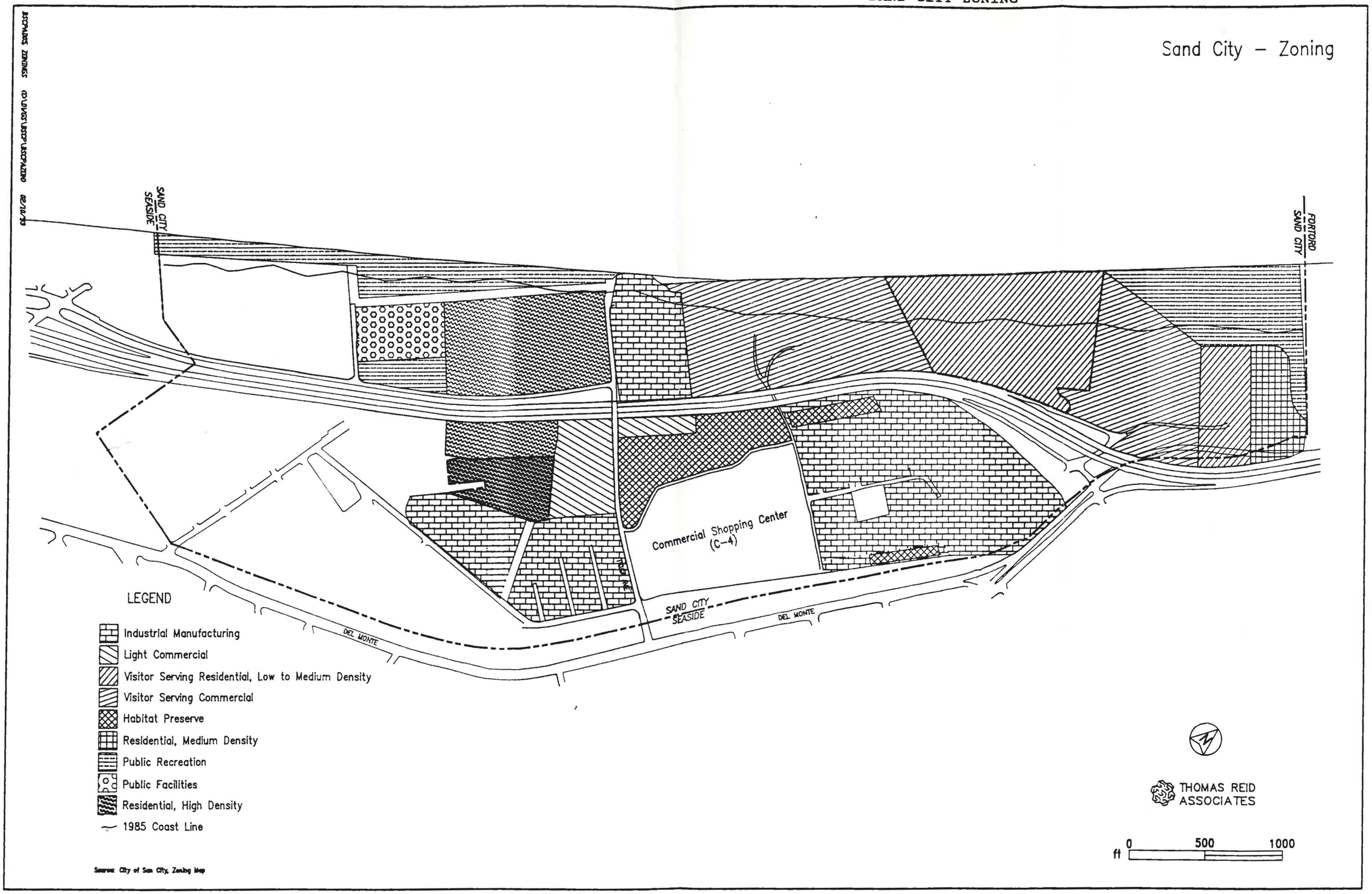
- maximize public access and recreation along the coast,
- protect sensitive habitats,
- protect visual resources, and
- encourage coastal dependent, visitor-serving uses along the coastside.

In Sand City much of the land within the Coastal Zone is undeveloped, particularly lands on the west side of Highway 1. Recent sand mining activities both on the west and east side of the Highway have resulted in significant disturbance of historic sand dunes. North of Tioga Ave., west of Highway 1, much of the land is divided into large parcels and is owned by a few large landowners. South of Tioga Ave., and west of Highway 1, the land has been subdivided into hundreds of small lots which are owned by almost as many small landowners.

Sand City's Local Coastal Program was certified by the Coastal Commission in 1984. In 1989 Sand City's LCP was the second LCP to be scheduled for a 5 year review. The review is currently before the State Appellate Court for adjudication. The existing zoning for Sand City is shown in Figure 7.

The Sand City LCP governs land uses in the coastal areas of Sand City. An amendment to the existing LCP may be processed as part of the Sand City HCP process to change land use designations and allow for implementation of the plan.

FIGURE 7 -- SAND CITY ZONING



3.3.2 Sand City General Plan

The City's General Plan guides development in most areas east of Highway 1. All urban development in Sand City is located on the east side of Highway 1. In this area, the City is dominated by industrial, heavy commercial, and warehouse uses. There are about 100 residences scattered throughout the urbanized area of Sand City. The residences consist of small single family homes, larger duplexes, mobile homes, and apartments built on the second floor of commercial buildings. In 1989 a Costco Store was built in the center of town just north of Tioga Ave. at Metz St. The area surrounding Costco is being developed with a larger regional shopping center (known as the Sand Dollar Shopping Center). Development of the remaining portion of the shopping center, Sand Dollar Phase 2, north of Playa Avenue, is dependent on the outcome of the HCP process since rare and endangered species habitat is found in the Phase 2 area.

3.3.3 Specific Plan Ordinance

The General Plan is supported by a Specific Plan Ordinance (#84-7) which sets forth guidelines for the development of specific plans. The proposed HCP will require a Specific Plan for the East Dunes (See Figure 2, Area "V") which will delineate habitat conservation areas, and development envelopes. This will conform to the provisions of the HCP implementation plan and funding process. See Section 4.2.1 for full discussion of the proposed HCP and use of the Specific Plan designation.

The following elements are required for specific plans:

1. Project description and development envelop boundaries;
2. Native and rare/endangered plant habitat envelop boundaries and plans as consistent with this HCP;
3. Public accessways, view corridors, landscaping, and buffer areas;
4. Geological hazards assessment;
5. Design concepts for planned unit development (PUD);
6. Locations of abandon and new streets;
7. Description of proposed lot consolidation, transfer development credits (TDC) and estimated residential densities;
8. New zoning configurations;
9. Design parameters and aesthetics considerations for height, color, design, bulk, and mass;
10. Description of provisions for sewer/water service;
11. Description of provisions to insure buffering from surrounding commercial and industrial land uses;
12. Analysis of consistency with the City's adopted Housing Element for residential projects;
13. Supporting documentation such as biological surveys, geology reports, and maps.

4. PLAN IMPLEMENTATION

The implementation of the Proposed HCP involves several components including:

- o Proposed HCP Habitat Planning Areas:
- o Legal obligations for the property owners and the city with state and federal agencies;
- o Financial obligations for the city, property owners, and creation of a Habitat Management District;
- o Phasing of the proposed HCP implementation elements;
- o Administration and management of the proposed HCP; and
- o Financing options for the proposed HCP.

Each of these components will differ according to which area of the city the habitat conservation effort is located. The timing of each of these implementation components will also vary according to location and the start of residential or commercial development in those areas.

Agreements or statement of intents for public agencies or private property owners will be necessary for final approval of the HCP. The Service suggests that any such agreements which can be crafted now should be included in the HCP. The City already has a statement of support and long-term maintenance by Caltrans of the highway shoulder right-of-ways when the area is revegetated in coastal dune habitat, as proposed by the HCP. See Appendix E for this agreement.

Agreements with California Department of Parks and Recreation and the Monterey Regional Park District could be developed as part of an on-going habitat maintenance and monitoring program.

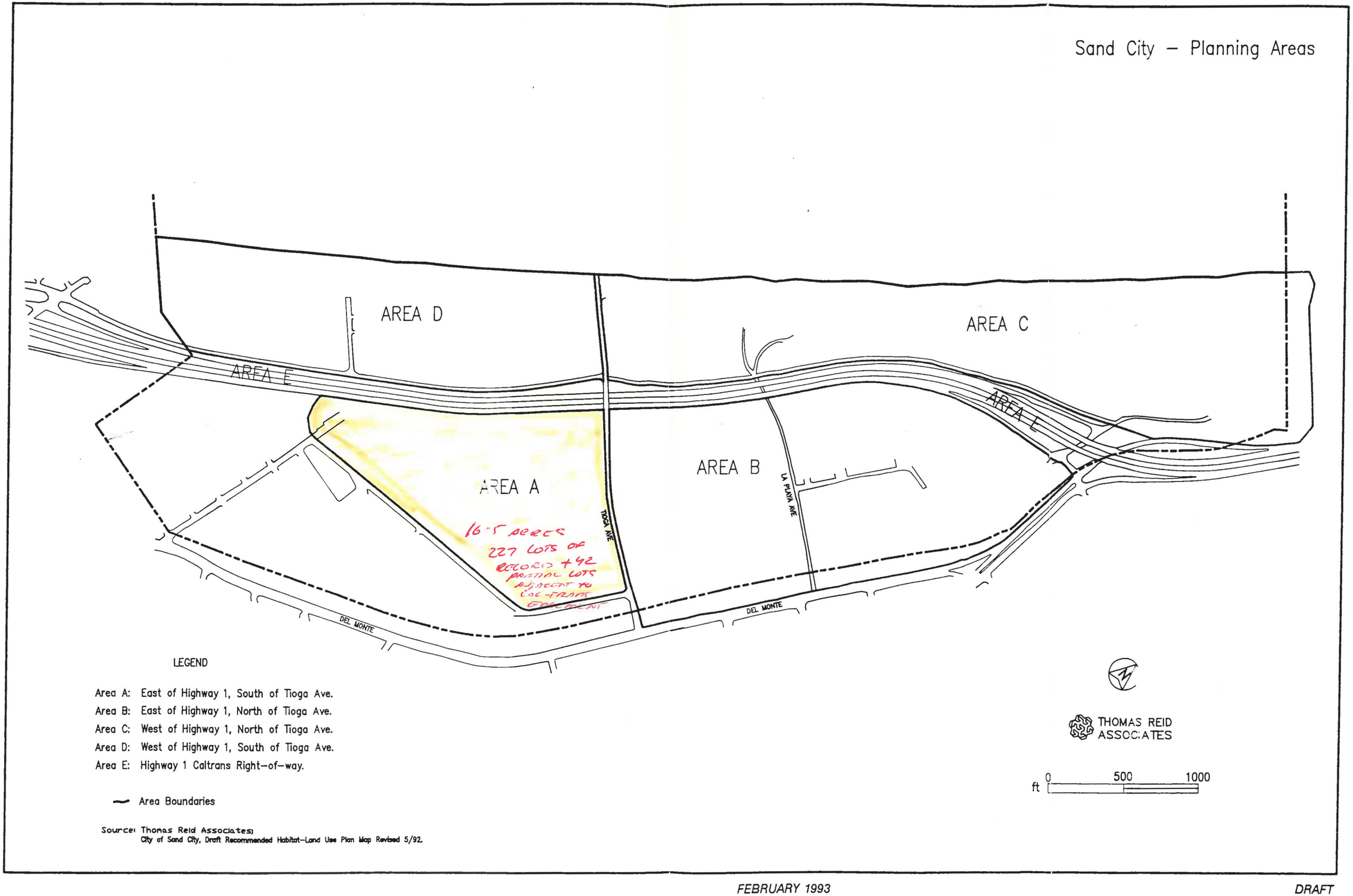
4.1 Proposed HCP Habitat Planning Areas

For purposes of HCP implementation the City has been divided into five habitat conservation planning areas as shown in Figure 8. Figure 2 illustrates more specific locations ("Notes") within these Habitat Planning Areas.

4.1.1 AREA A: East of Highway 1 - South of Tioga Avenue ("East Dunes")

The primary habitat area of concern in Sand City is the East Dunes. The vacant area in the East Dunes comprises an estimated 16.5 acres of remnant dunes, which although dominated by ice plant and trash, still supports native flandrian dune vegetation. The native vegetation is scattered throughout the area and

FIGURE 8 -- HABITAT CONSERVATION PLAN PLANNING AREAS



includes the rare dune gilia and coastal buckwheat, host plant of the federally endangered Smith's Blue Butterfly.

The area for the gilia and buckwheat constitute approximately 12.7 acres of the East Dunes area, although the actual density of the plants varies greatly with most of the plants concentrated in an estimated 3.8 acre high density area in the northeast corner, which in a more protected lee-side location.

4.1.2 AREA B: East of Highway 1 - North of Tioga Avenue

The undeveloped area on the north side of Tioga Avenue, east of Highway 1, consists primarily of Phase I and II of the Sand Dollar Shopping Center. Phase I was recently constructed and includes a 7.6 acre habitat preserve located just east of Highway 1 between Tioga and Playa Avenues.

The Phase II area consists of new commercial/retail shopping north of Playa Avenue. The expansion would create an additional 250,000 square feet of commercial development and would preserve a 4.3 acre habitat area located just north of the existing 7.6 acre preserve, and adjacent to east side of Highway 1.

There is also a narrow corridor of undeveloped land along the east side of Highway 1 just north of the Sand Dollar Phase II mitigation area. This corridor is owned by Granite Construction and is designated by this HCP as part of a habitat corridor (Area "Q" and "S" on the HCP map).

4.1.3 AREA C: West of Highway 1 - North of Tioga Avenue

This area is largely undeveloped and mainly consists of disturbed sand dunes and large infestations of ice plant. Smith's blue butterfly habitat is restricted to the extreme north end of the study area on land adjacent to Fort Ord.

The area north of Tioga Ave. contains several private land holdings under six ownerships. As identified on the Monterey County Assessors map these six major properties include: (1) 35 acre Sands of Monterey property at the extreme north; (2) 1.0 acre M. Calebrese site; (3) 21 acre former landfill site; (4) 2.5 acre site owned by Granite Construction; (5) 16 acre site owned by Monterey Sand Company, and a 7.9 acre site owned by Calabrese.

4.1.4 AREA D: West of Highway 1 - South of Tioga Avenue

The area South of Tioga on the west side of Highway 1 is also dominated by disturbed sand dunes with little vegetation. It has been divided into 25 foot-wide lots and has numerous landowners. It includes some larger inholding of the State Department of Parks and Recreation and the Monterey Peninsula Regional Park District.

4.1.5 AREA E: Highway 1 Caltrans Right-of-Way

The Highway 1 Caltrans right-of-way (ROW) includes both sides of Highway 1 but not the center median area. The ROW currently consists of ice plant and varies in width from 35 feet to 60 feet along the roadway and at exits and over-passes. This area will be eventually integrated into adjacent private property utilized to expand and lengthen a habitat corridor and stepping stone area for the entire length of the city.

4.2 AREA A OBLIGATIONS: East of Highway 1 - South of Tioga Avenue (referred to as the "East Dunes")

Implementation of the proposed HCP in Habitat Planning Area A, the East Dunes (see Figure 2, Note "V"), is driven by the current constraints to development including the small lot size, lack of infrastructure, and the inability of the private property owners to comply with the requirements for habitat conservation if any take of rare or endangered species occurs on their land.

Left alone, there would be some piecemeal development either on the fringes where access to existing utilities makes it economically feasible, or where owners have sufficient adjacent parcels. This would result in not only an inefficient pattern of development but would prevent habitat enhancement in the future.

The East Dunes area of Area A contains approximately 227 legal lots of record, zoned (R-3) for high density residential and commercial development. In addition, 42 partial lots lie adjacent to the Highway 1 right-of-way (see Figure 2, portions of Note "W". These partial lots represent approximately 1.8 acres and will be utilized as part of the East Dunes land assembly. The East Dunes area is split into two sub-areas:

1) the developable area which is an estimated 12.7 acres (190 lots); and

2) the conserved habitat (37 lots plus 42 partial lots) area which comprises an estimated 3.8 acres. No development is allowed in the conserved habitat.

The East Dunes high density habitat area (illustrated in Figures 4 and 6) would be part of the developable area and all new conserved habitat areas will be utilized as part of mitigation for this take. This high density habitat consists of approximately 85 individual private buildable lots and (approximately 3.0 acres) and city streets (approximately 0.80 acres) totaling an estimated 3.8 acres.

In order to satisfy the USFWS and CDFG requirments for mitigation to proceed take of an endangered or special concern species, it appears that a phasing of development in the East Dunes will be necessary. Some mitigation habitat areas identified in the HCP as new or enhanced areas, will need to be

started and deemed "successful" befor any take of rare or endangered plants.

The successful 7.6 SD Pre-mitigation area should allow for a "Phase I" take in the East Dunes, specifically the area west of the high density habitat (see Figures 5 and 6).

Ths is an area os low density and poor quality buckwheat plants, with only limited observations of 13 Smith's blue butterflies. The buckwheat plant densities are low to medium.

Dune gilia plants in the Phase I zone are also in the low to medium density range. Mitigation for dune gilia in the SD Pre-mitigation area has been on-going since 1987 and an additional area will be developed upon approval of this HCP in the habitat strip along the east-side strip of Highway One and by possible contributions to a regional mitigation banking program.

A "Phase II" take of the high density habitat in the East Dunes would only occur as additional habitat area come to be set-aside and the HCP management program implemented. A monitoring program, such as the one at SD Pre-mitigation Area, will be implemented for these areas and the success of these efforts will be judged against a set of criteria agreed upon by the City of Sand City, the USFWS, and the CDFG.

Additional mitigation areas, as outlined in the HCP, will come on line in successive stages. As each of these mitigation areas prove successful, then additional take in the East Dunes could be allowed in the area of high density habitat. This means that the high density habitat would be taken last, after successful mitigation in other principal area of the City.

Alternative # 3 would conserve much of this high density area and allow development in westerly, less-dense habitat area in the East Dunes (see Section 5.4).

4.2.1 General Obligations

As the central part of the proposed HCP, the entire area of the East Dunes will be designated the East Dunes Specific Plan (hereinafter "specific plan") by the City. The Proposed HCP Land Use Map, Figure 2 illustrates this area as Notes: "V" and "W". The specific plan boundary will also include fringe areas among the developed areas which are appropriate for redevelopment such as open storage yards, under-utilized residential or commercial properties which could be included in a coordinated planned unit development. Components of the specific plan shall include all elements contained in the Sand City Specific Plan Ordinance #84-7, as listed in Section 3.3.2 above.

The specific plan will assure that the whole of the East Dunes is both conserved and developed in a comprehensive manner rather than allowing piece meal development, which would prevent

a comprehensive program of habitat preservation and conservation from being implemented. Lack of an approved HCP would more than likely lead to the gradual elimination of the existing endangered habitat (buckwheat and dune gilia) from ice plant invasion, drought, vandalism, and neglect.

The City of Sand City could also utilize the provisions of the Sand City Redevelopment Plan to assist in the implementation of the specific plan and the residential development in the East Dunes or in other appropriate areas of the City. This could allow the property owners to receive benefit for some land costs for conserved habitat land set-aside from future property taxes. This could be accomplished through a special property tax "pass through" provisions granted to redevelopment agencies after the land has been developed and property tax are generated. Such action must be approved by the City Council acting as the Sand City Redevelopment Agency.

The specific plan could utilize the concept of transfer development credits (TDC) to allow land owners to receive credit for land which they own and which is located within the non-buildable conserved habitat area.

All land owners in the specific plan, as part of the TDC, could "pool" their lots together and each share in the development rights of the remaining developable area. Under this scenario, each property owner in the specific plan would receive one credit for each legal buildable lot owned. Development would only be allowed within the developable area. Thus, financial gain derived from projects approved in the development area would be equitably split among the East Dunes specific plan land owners. The conserved habitat land would be publicly dedicated as a conservation easement as mitigation for the impact of development.

4.2.1.1 Legal Agreements and Financial Obligation

Under an acceptable and feasible HCP approved by the USFWS, DFG, and the Sand City Council, the land owners and the City would enter into several legal agreements. These may include memorandums of understanding ("MOU's"), development agreements, mitigation agreements, and/or conservation easements. This could also include deeding legal lots of record and the City's street easements into a joint venture partnership for location of habitat conservation and residential/commercial development. City streets are a valuable asset for both development and for habitat conservation. The existing and "paper" streets will be utilized for both development and for the conserved habitat in the East Dunes.

The City and property owners development agreement is critical to facilitating the process of providing for protection of endangered habitat and development of private property in this area. This agreement would provide the legal mechanism for the

land owners (or a master developer) to jointly acquire the specific plan parcels and build high density planned unit development (hereinafter "PUD") residential housing in the developable area. The City would institute a requirement for PUD development in the East Dunes specific plan.

The City and property owners agreement in conjunction with state and federal mitigation agreements and memorandums of understanding will provide legal mechanisms of land use and financial responsibility for long-term conservation and maintenance of the conserved habitat areas. The City will be legally responsible for the development and maintenance of the habitat areas, but the financial responsibility will be borne by the property owners and the eventual master developer. This will be instituted through the development and mitigation agreement, and the payment of habitat development fees, annual fees, and commit to an on-going obligation for monitoring and preservation of the habitat.

This financial responsibility could be conducted through the development of a assessment district referred to as the Habitat Maintenance District (hereinafter "HMD"). If a benefit assessment district is not approved then the financial responsibility for HCP implementation could be carried out in the joint venture agreements, MOU's, deed restrictions, and/or conditions of project approval and mitigation monitoring programs.

The HMD would be administered by the City which would assess and collect fees for the implementation of habitat restoration (ice plant removal, planting, netting, irrigation) and long-term maintenance and monitoring.

The HMD would operate as a benefit assessment district (or other such area-wide financing district such as a Mello-Roos district) and would assess fees based on value of benefit received and the amount of habitat conserved or taken. Fees can be adjusted annually depending upon which habitat areas have been developed. The HMD would cover those areas where habitat is either preserved and set-aside or where new habitat corridors/stepping stone areas have been established.

Upon receipt of a grading permit for any project in the developable area of the East Dunes, the master developers or landowners must pay a one time fee for each unit of development for restoration of the East Dunes conserved habitat and an on-going HMD fee per residential unit to help pay cost of administering and implementing the City-wide HCP. The minimum habitat fee will be developed as part of the HMD based on a benefit assessment value as determined by the HMD. The exact amount of each owners financial obligation will be determined the HMD Director (City Manager) after a final budget for each HCP phase is approved by the HMD.

As an example, part the HMD assessment could include a East Dunes restoration fee,(if based on 100 PUD units @ $1500 per unit, this could generate $150,000) for restoration of the East Dunes conserved habitat. The level of funding will be consistent with costs incurred for restoring conserved habitat at the Sand Dollar Shopping Center. The fees will be paid into the HMD and all required financing collection and dispersals for improving and enhancing habitat in the East Dunes would be governed according to assessment district procedures as detailed by state law. Other assessment fees will be spread among other property owners in the HMD for HCP implementation is other habitat areas.

The annual assessment fees, will be adjusted according to conservation and maintenance needs within the habitat areas of the HMD. Payment of the fees will be guaranteed through legal mechanisms of the city-wide HMD. Monies generated from the fees will be used for long term protection, enhancement and management of the habitat for the species of concern.

Development in the East Dunes will be subject to additional site specific mitigation to reduce take. These are described in Section 4.2.2 following below.

4.2.2 Protection of Conserved Habitat

4.2.2.1 Specific Landowner/Developer Obligations

Any development which takes place on lands adjacent to conserved habitat in the East Dunes must provide for the following:

Provide a Grading Restriction Line on Grading Plans. The line should demarcate areas where grading is allowed and where it is prohibited.

Erect Temporary Fence and Post Signs. For each project a temporary fence must be constructed at the boundary between areas which will be graded and/or disturbed and areas prohibited from grading and/or disturbance to prevent any unauthorized grading in undisturbed habitat areas. The fence must be erected under the supervision of the City of Sand City before any construction activity, including grading, land clearing, or vehicle access. Grading beyond the designated area may result in a violation of the Endangered Species Act and will be subject to a penalty. Signs stating that penalty will be posted every 100 feet along the fence.

Pre-Grading Conference. Prior to the start of any grading or construction activities in areas adjacent to conserved habitat, an on-site pre-grading conference must be held with construction supervisors and/or personnel. At that meeting all personnel will be shown the fence and signs, and warned of the prohibition of performing any ground disturbing activities beyond the fence.

Grading Restriction Acknowledgement Forms. To prevent breaches of habitat boundaries during grading or construction activities all on-site construction field supervisors or other appropriate personnel must sign a form acknowledging that grading within conserved habitat areas may be a violation of federal law and may be punishable by the payment of a $50,000 fine and one-year imprisonment. The field supervisors will be responsible for any violations which take place by non signatory operators working under their supervision. Violations would also trigger the immediate issuance of a stop work order for all construction related activity on the property on which the violation occurred. The City of Sand City will be first jurisdiction for reviewing any violation, and should review a violation immediately, prepare a statement of the incident, and allow work to continue as allowed in the HCP. The landowner could be subject to fines or penalties as judged by the City and the U.S. Fish and Wildlife Service.

Resource Salvage. Prior to land disturbance in each parcel, Smith's blue host plants, rare plants, and black legless lizards should be salvaged as practical. For plants it is desirable to collect seed or take cuttings from the plants before destruction occurs. Any salvaged black legless lizards should be transplanted in suitable good or excellent habitat under the direction of a qualified biologist.

Pay for On-Site Monitoring. Each landowner must pay the direct costs of having the City monitor development activities.

Landscaping. The planting of any invasive non-native plant species shall be prohibited for use in exterior project landscaping within the development envelope. The use of drought tolerant plants and native plants indigenous to the area is encouraged.

Preserve Protection Fencing. Each landowner shall provide permanent heavy duty fencing, barrier and/or gates along the periphery of any portion of the development adjacent to conserved habitat where there is a possibility of unauthorized vehicle access.

4.2.3 Restoration of Conserved Habitat

4.2.3.1 Dune Stabilization, Exotic Species Control, and Habitat Restoration

All disturbed areas within the conserved habitat of the East Dunes will be subject to exotic species control and native plant restoration using the funding provided by the landowners within the developable area. As funds become available the City shall develop and carry out a restoration plan for the conserved habitat.

Major infestations of exotic species should be destroyed. Prior to beginning a control program, technicians shall be trained and a priority system of eradication developed. Exotic plants growing in the most sensitive habitat areas shall be eradicated first. Techniques used for exotic species control shall reflect sensitivity of nearby habitat areas. For example hand removal or hand displacement should precede herbicide spraying near populations of rare plants or where there are dense concentrations of Smith's blue host plants or other species of concern.

Enhancement planting must be done in dead ice plant patches or in bare ground in any areas over 500 square feet in size. The particular enhancement schemes for these areas should be approved by the City prior to implementation. The obligation to carry out this enhancement planting will begin upon the collection of restoration fees which shall be no later than issuance of a Grading Permit.

4.2.4 Specific Landowner/Developer Obligations

a. Landowners with lots contained in the conserved habitat area shall participate in the HMD, development joint venture, specific plan, and PUD program and dedicate lots in the conserved habitat area to the public as conserved habitat. They will receive TDC for their lots, combining the total East Dunes lots into areas designated for development and for conservation. Each owner, as a participant in the development agreement with the City and the Service would participate in the ownership of the PUD development as specified in the Specific Plan.

b. Landowners with lots contained in the developable area shall participate in the HMD, development joint venture, specific plan, and PUD program.

c. Pay one time East Dunes restoration fee and ongoing maintenance assessment fees calculated by the HMD.

d. Establish and maintain buffer areas between the development and preserved habitat to protect habitat from urban

activities, and integrated development landscaping into the conserved habitat native plant mix.

e. Prohibit large scale use of pesticides or use of invasive species in landscaping.

f. Bind successors to habitat protection and funding obligations through CC&R's, deed restrictions, or other appropriate methods.

4.2.5 Specific City of Sand City Obligations

a. Require that landowners with lots in the East Dunes participate in the East Dunes specific plan, through city ordinances, development and mitigation agreements, and deed restrictions.

b. Assure that all activities in the Sand City HCP area which are subject to City ordinances comply with the provisions of the Section 10(a) permit and the HCP.

c. The Sand City will administer all provisions of HCP, and will enforcement all provisions of the HCP. The City will issue a stop work order immediately upon notification that there has been grading or disturbance within the conserved habitat.

d. According to HMD provisions, collect one time restoration and HMD fees from all landowners who obtain grading permits for development in the East Dunes, and to advance funds as needed for each phase of the HCP implementation, maintenance, and monitoring.

e. City Council to authorize the City Manager to establish the HMD and oversee a benefit assessment for the collection of annual habitat conservation funds.

f. Authorize the use of the Redevelopment Agency to negotiated with East Dunes property owners and/or master developer for use of property tax pass-through for assisting in compensation for development costs and habitat land set-aside.

4.2.6 HCP Administration Obligations

As provided in this HCP the City of Sand City will administer provisions of the HCP and will be responsible for the following:

a. Establish an annual habitat restoration budget for each area within the HCP area boundaries as appropriate for timely implementation of the HCP.

b. Begin habitat restoration of dedicated habitat areas according to priority areas and HCP timetable upon receipt of restoration funds from City.

c. Carry-out long-term maintenance activities using funds generated from homeowner's assessment.

d. Authorize the dispersal of HMD monies for each phase of HCP implementation.

4.3 AREA B OBLIGATIONS: East of Highway 1 - North of Tioga Avenue

Habitat Planning Area B is dominated by the 7.6 acre Pre-mitigation habitat preserve area on the Sand Dollar Phase I Shopping Center, which is located just east of Highway 1 and north of Tioga Road (see Note "U" on Figure 2). The habitat preserve, which was established in 1989 by the City of Sand City as a condition of the shopping center project approval, has been under restoration since that time. To date, the restoration of the Phase 1 habitat preserve with native plants, including host plants of the Smith's blue butterfly, has been very successful. See "Spring 1991 Monitoring Report, Biological Resource Management Plan, Sand City", prepared by Harding Lawson Associates, May 3, 1991, for details.

The pre-mitigation habitat preserve serves as a model of what can be accomplished in coastal dune maritime chaparral restoration. This are will serve as a major "stepping stone" along the east side habitat corridor linking the East Dunes areas to the northern habitat areas, all the way to the Fort Ord boundary.

The proposed Phase II of the Sand Dollar Shopping Center will be required, as part of this proposed HCP, to expand the habitat preserve by an additional 4.3 acres, which is illustrated as Note "S" on the Figure 2. The Phase II habitat preserve is located just north and adjacent to the pre-mitigation preserve.

In August 1991, Harding Lawson Associates prepared a "Draft Biological Resources Management Plan for the Phase II Sand Dollar Shopping Center". Copies of that document are available at the City Planning Department.

Other areas include a high bank of habitat preserve (illustrated as Note "Q" on Figure 2) which will be planted and included in the Habitat Maintenance District. Habitat Land Use Map Notes "Q" and "S" will expand the habitat stepping stone and habitat corridor along with the Caltrans right-of-way.

4.3.1 General Obligations

The Phase II commercial area north of Playa Avenue has been split into two sub-areas: 1) the developable area, and 2) the

habitat preserve (see Figure 2). No development is allowed in the habitat preserve.

Upon receipt of a grading permit for any project in the developable area the developers/landowners must carryout the habitat protection and restoration provision contained below within the habitat preserve.

Upon completion of development, the project will be assessed an annual habitat maintenance fee as determined by the HMD. Payment of the fees will be guaranteed through the assessment mechanism of the HMD as required by state law governing assessment districts. Monies generated from the fees will be used for long term protection, enhancement and management of the habitat for the species of concern. The existing Phase I habitat area (illustrated as Note "U' on Figure 2) will be incorporated into the HMD and annual assessment fees will be adjusted given its existing condition and value.

Pre-mitigation, in addition to exiting pre-mitigation land at Phase I of the shopping center, could begin on the 4.3 acre Phase II habitat area, after approval of the HCP and establishment of the HMD. Current efforts by the property owner, Monterey Sand Company (MSCo), may result in additional mitigations as part of an environmental assessment or as required by the Service. In any event, the approval of the City-wide HCP will incorporate any habitat efforts that may be accomplished by MSCo, and any conditions imposed upon the City-wide HCP must be incorporated by MSCo into its habitat efforts for consistency with this HCP.

4.3.2 Protection of Conserved Habitat

4.3.2.1 Specific Landowner Obligations

Any development which takes place on lands adjacent to conserved habitat areas in Area B must provide for the following:

Provide a Grading Restriction Line on Grading Plans. The line should demarcate areas where grading is allowed and where it is prohibited.

Erect Temporary Fence and Post Signs. For each project a temporary fence must be constructed at the boundary between areas which will be graded and/or disturbed and areas prohibited from grading and/or disturbance to prevent any unauthorized grading in undisturbed habitat areas. The fence must be erected under the supervision of the City before any construction activity, including grading, land clearing, or vehicle access. Grading beyond the designated area may result in a violation of the Endangered Species Act and will be subject to a penalty. Signs stating that penalty will be posted every 100 feet along the fence.

Pre-Grading Conference. Prior to the start of any grading or construction activities in areas adjacent to conserved habitat, an on-site pre-grading conference must be held with construction supervisors and/or personnel. At that meeting all personnel will be shown the fence and signs, and warned of the prohibition of performing any ground disturbing activities beyond the fence.

Grading Restriction Acknowledgement Forms. To prevent breaches of habitat boundaries during grading or construction activities all on-site construction field supervisors or other appropriate personnel must sign a form acknowledging that grading within conserved habitat areas may be a violation of federal law and may be punishable by the payment of a $50,000 fine and one-year imprisonment. The field supervisors will be responsible for any violations which take place by non signatory operators working under their supervision. Violations would also trigger the immediate issuance of a stop work order for all construction related activity on the property on which the violation occurred. The City should review a violation immediately, prepare a statement of the incident, and allow work to continue as allowed in the HCP. The landowner would be subject to fines or penalties as determined by the City and the U.S. Fish and Wildlife Service.

Resource Salvage. Prior to land disturbance in each parcel, Smith's blue host plants, rare plants, and black legless lizards should be salvaged as practical. For plants it is desirable to collect seed or take cuttings from the plants before destruction occurs. Any salvaged black legless lizards should be transplanted in suitable good or excellent habitat under the direction of a qualified biologist.

Pay for On-Site Monitoring. Each landowner must pay the direct costs of having the City monitor development activities.

Landscaping. The planting of any invasive non-native plant species shall be prohibited for use in exterior project landscaping within the development envelope. The use of drought tolerant plants and native plants indigenous to the area is encouraged.

Preserve Protection Fencing. Each landowner shall provide permanent heavy duty fencing, barrier and/or gates along the periphery of any portion of the development adjacent to conserved habitat where there is a possibility of unauthorized vehicle access

4.3.3 Restoration of Conserved Habitat

4.3.3.1 Dune Stabilization, Exotic Species Control, and Habitat Restoration

All disturbed areas within the conserved habitat Area B - north of Tioga Avenue will be subject to exotic species control and native plant restoration using the funding provided by the HMD. As funds become available the City shall carry out the restoration elements of this HCP for the areas to be restored and enhanced.

Major infestations of exotic species should be destroyed. Prior to beginning a control program, technicians shall be trained and a priority system of eradication developed. Exotic plants growing in the most sensitive habitat areas shall be eradicated first. Techniques used for exotic species control shall reflect sensitivity of nearby habitat areas. For example hand removal or hand displacement should precede herbicide spraying near populations of rare plants or where there are dense concentrations of Smith's blue host plants or other species of concern.

Enhancement planting must be done in dead ice plant patches or in bare ground in any areas over 500 square feet in size. The particular enhancement schemes for these areas should be approved by the City prior to implementation. The obligation to carry out this enhancement planting will begin upon the collection of restoration fees which shall be no later than issuance of a Grading Permit.

4.3.4 Specific Landowner Obligations

a. Pay ongoing assessment fees required by the HCP and calculated by the HMD.

b. Establish and maintain buffer areas between the development and preserved habitat to protect habitat from urban activities.

c. Prohibit large scale use of pesticides or use of invasive species in landscaping.

d. Bind successors to habitat protection and funding obligations through CC&R's, deed restrictions, or other appropriate methods.

4.3.5 Specific City of Sand City Obligations

a. Assure that all activities in the Sand City HCP area which are subject to City ordinances comply with the provisions of the Section 10(a) permit and the HCP.

b. Assist the enforcement of all HCP provisions by issuing a stop work order immediately upon notification by the City that there has been grading or disturbance within the conserved habitat.

c. Assist with the establishment and oversee the HMD (as a benefit assessment or park maintenance district) for the collection of annual habitat conservation trust funds.

4.3.6 Plan Administration Obligations

As provided in this HCP Sand City will administer provisions of the HCP and will be responsible for the following:

a. Establish an annual habitat restoration budget for each area within the HCP area boundaries as appropriate for timely implementation of the HCP.

b. Carryout long-term maintenance activities using funds generated from homeowner's assessment.

4.4 AREA C AND D OBLIGATIONS: West of Highway 1 - North and South of Tioga Avenue

4.4.1 General Obligations

Although little habitat exists on the west side of Highway 1, development will be integrated with an enhanced habitat corridor that could be used as a potential north-south dispersal corridor by the Smith's blue butterfly. Some buckwheat plants are part of the dune vegetation, but according to Dr. Richard Arnold there are no observed butterflies in this area primarily due to wind conditions and poor habitat conditions.

However, there exists the possibility for some potential dispersal of butterflies if additional buckwheat plants are utilized in a corridor and/or stepping stone fashion running to the south. The corridor will consist of a mix of dune maritime chaparral and native vegetation for dune stabilization for control of wind erosion of the dunes.

For each private or public development project proposed in Habitat Areas C and D west of Highway 1, habitat corridors and habitat stepping stone areas will be required on the east side of each project site, between the project and Highway 1. The width of corridors and size of the stepping-stones will vary on each project site and will be reviewed at the time of the project application. The minimum width will be 50 feet,including the Habitat Area F - Caltrans right-of-way (ROW) to the east (see Section 4.5 of this HCP), to ensure opportunity of Smith Blue butterfly dispersal.

Each project will be required to submit a habitat and landscaping plan for approval by the City. In some areas this

corridor may extend beyond 50 feet depending on the project site and the Caltrans ROW. This is most likely to occur along the Sands of Monterey site (see Note "M" on Figure 2) and in the Habitat Area D where conditions exist for wider corridor and larger habitat stepping-stone areas.

In Habitat Area D - south of Tioga Avenue, both private individuals and the state and regional park agencies have land holdings. A specific plan is required for this area as part of the existing Sand City Local Coastal Program. Such a specific plan will require, as part of this HCP, provisions for habitat corridors, habitat stepping stone areas, protection from active public recreation, maintenance, and monitoring.

All Habitat Area D landowners will be part of the Habitat Maintenance District and will be assessed a proportional share the costs of long-term maintenance and protection of the habitat through the HMD. The funding program shall be equitable to all parties and shall generate enough funding to carry out the obligations specified below.

In Habitat Area C - north of Tioga Avenue, the former Sands of Monterey project must also include a habitat buffer on the north side between the project and Fort Ord (see Note "M" on Figure 2). The landowner/developers will be responsible for providing the corridor/buffer during initial grading activities. Corridors/buffers should contain native dune plants from the approved dunes plant palette indigenous to the Sand City. The restoration plan must be approved by the City. Upon successful restoration of the habitat corridors the land owner will either dedicate the land to the public or a grant a habitat easement on the land.

The funding formula for private development projects shall be determined by the City and the HMD at the time of the City's review of their proposed project. The habitat conservation fees will be determined by the HMD and each commercial and hotel property will be assessed according to provisions of the HMD.

Funding for habitat conservation efforts on public or non-profit land parcels will be borne by the agency and annual fees from assessments from the HMD. All funds will be deposited with the HMD and will be administered by the City Manager. All HMD fees will be adjusted each year based upon a budget approved by the City, and adjusted to compensate any changes in conservation or maintenance of the habitat areas within the HMD.

4.4.2 Specific Landowner/Developer Responsibilities

4.4.2.1 For Habitat Areas

Upon issuance of a grading permit for any project, each landowner/developer must fund and carryout exotic species control, dune stabilization and restoration, and enhancement

planting in the west side habitat corridors. The HMD will assess each property in accordance with assessment district law to compensate the estimated cost of all restoration activities until such time as the activities are completed to the satisfaction of the City. The City should assess success based on the set of performance standards set forth below.

4.4.3 For Development Areas

All landowners/developers in the City of Sand City which have planned development adjacent to conserved habitat must comply with the following provisions of the HCP:

4.4.3.1 Pre-Development Planning

Upon issuance of the Section 10(a) Permit, landowners may seek permits to develop the parcels in accord with the HCP. At that time, the City will process development applications as appropriate and will review detailed plans. The detailed plans will be based on an accurate site survey and project engineering which is not available now. The detailed plans will contain more precise delineation of the development envelopes and habitat corridors than is shown in the HCP and will be incorporated in the HCP upon the City finding the plan in compliance with the HCP.

4.4.3.2 Development Restrictions

Each private or public agency landowner seeking to develop property on the west side must comply with the following provisions:

Pay for On-Site Monitoring. Each landowner must pay the direct costs of having the City monitor development and restoration activities.

Landscaping. The planting of any invasive non-native plant species shall be prohibited for use in exterior project landscaping within the development envelope. The use of drought tolerant plants and native plants indigenous to the area is encouraged.

Preserve Protection Fencing. Each landowner shall provide permanent heavy duty fencing, barrier and/or gates along the periphery of any portion of the development adjacent to habitat corridors where there is a possibility of unauthorized vehicle access into the corridor.

Post Signs. "No Trespassing" signs shall be posted in strategic locations along the boundary between permanent development and the habitat corridors. If public access is allowed then there should be signs installed informing people of the sensitivity of the habitat, and prohibition against straying from marked trails.

Drainage Controls. Runoff from developed portions of the site should be prevented from entering drainage leading to conserved habitat.

Habitat Corridor Conveyance to Public. Conveyance of habitat corridors to the public, whether it be through direct land dedication or the creation of habitat easements, will take place when development is substantially completed and restoration has been judged to be successful by the City pursuant to HCP standards. Once habitat conveyance occurs the HCP implementing agency would provide restoration and enhancement services on preserved land using City wide HCP generated funds. At that time the landowner will be released any from future direct responsibility for the habitat lands.

Pesticide Restrictions. Pesticides used in a manner which creates the potential for pesticide drift into habitat areas is prohibited in development areas unless it is essential for public health and then only under the supervision of the City. Typically any aerial, blower or high pressure mechanical applications have the potential to cause pesticide drift, particularly under windy conditions. Low volume back pack sprayers are acceptable for use near habitat. Each landowner will create a specific covenant running with the land which restricts the use of high volume/high pressure pesticide applicators near habitat areas.

Maintain Habitat Protection Fencing or Barriers. Deed restrictions running with the land will be established which require that future landowners maintain habitat protection fencing, signs, or similar appropriate barriers on their property.

Public Recreation Restrictions. Areas owned by the state or regional park districts shall restrict public access to areas of rare, threatened, or endangered species habitat. A public access and signage plan, consistent with the Sand City LCP, shall be submitted to the City for review as part of an application for a coastal development permit as part of any public recreation or park development project.

4.5 AREA E OBLIGATION: Caltrans Right-of-Way

4.5.1 General Obligations

The Caltrans Highway One right-of-way (ROW), Area E, represents an area in the proposed HCP which can provide land for additional habitat conservation efforts. This land area is approximately 40 feet-wide and 1.5 miles in length. The revegetation will be beneficial for returning the area to a more coastal dune environment by removal of invasive ice plant and then installing native plants.

Use of the ROW area is a part of the HCP program for partial compensation for habitat areas taken as part of its development program in the East Dunes or other areas of the City. This area may eventually be utilized for some rare, threatened, or endangered (RTE) species, but planting now would consist of native plants for stabilization and landscaping. Caltrans indicates that use of rare or endangered species in the ROW may be counter productive to these species and could interfere with highway maintenance of Highway One, including safety precautions due to blowing sand.

The City will explore with Caltrans and several other funding sources the possibilities for native restoration of the Caltrans Highway ROW shoulder area. The center median is not proposed for native plant revegetation due to potential expansion of Highway One to its center plan line.

The State of California Resources Agency (Agency) has several programs which may apply to this type of revegetation effort. The City has submitted a new grant request to the Agency for coastal native plant revegetation in the area of Sand Dunes Drive and the new Sand City bike path. Both are adjacent to Highway One ROW. (See Section 4.8.5 for additional information on this grant).

The City will continue to explore with the Agency and other agencies for potential funding of coastal habitat revegetation and creation of additional habitat corridors in support of the HCP program.

4.5.2 Specific Sand City/Caltrans Obligations

4.5.2.1 Revegetation and Enhancement of Habitat Corridor on Caltrans ROW

Erect Temporary Fence and Post Signs. For any accessible areas adjacent to the ROW corridor a temporary fence, in conjunction with the Caltrans ROW fence, must be constructed at the boundary between areas which will be graded and/or disturbed and areas prohibited from grading and/or disturbance to prevent any unauthorized grading in undisturbed habitat areas. The fence must be erected under the supervision of the City and Caltrans before any revegetation activity, including grading, land clearing, or vehicle access. Grading beyond the designated area may result in a violation of the Endangered Species Act and will be subject to a penalty. Signs stating that penalty will be posted every 100 feet along the fence.

Revegetation and Pre-Grading Conference. Prior to the start of any grading or construction activities in areas adjacent to enhanced habitat, an on-site pre-grading conference must be held with construction supervisors and/or personnel. At that meeting all personnel will be shown the fence and signs, and warned of

the prohibition of performing any ground disturbing activities beyond the fence.

On-going Maintenance and Monitoring. In conjunction with Sand City, Caltrans shall provide on-going irrigation, weeding, plant replacement, and monitoring of plant inventory and endangered species inventory and report these findings on an semi-annual basis for two years and then on an annual basis as part of their regular maintenance programs.

4.5.2.2 Dune Stabilization, Exotic Species Control, and Habitat Restoration

All disturbed areas within the Caltrans ROW will be subject to exotic species control and native plant restoration using the funding provided by the Environmental Enhancement grant. As funds become available the City shall develop and carry out a restoration plan for the conserved habitat in conjunction with Caltrans and the revegetation consultant.

Major infestations of exotic species (ice plant) should be destroyed. Prior to beginning a control program, technicians shall be trained and a priority system of eradication developed. Techniques used for exotic species control shall reflect sensitivity of nearby habitat areas. Large scale use of pesticides or use of invasive species in any areas adjacent to the ROW shall be prohibited.

4.6 Implementation Phases

The HCP implementation will occur in four phases, with different habitat, legal, and financial requirements occurring for each Habitat Area as discussed above. Implementation will not commence until after HCP is approved by Regulatory Agencies. The phases for the HCP implementation will occur in the following sequence, however some activities in different phases may overlap.

Phase I: Legal Agreements and City Resolutions/Ordinances
Year 0.0 to 0.5

a. City of Sand City and Habitat Area A area property owners will enter into a joint venture agreement (or other appropriate legally binding agreement) to assemble individual private property lots (through the use of the "Transfer Development Credits") and city streets into "developable" and "conserved habitat" areas as prescribed by the final HCP and detailed in the East Dunes specific plan.

b. The City of Sand City and City Redevelopment Agency will designate Habitat Area A "East Dunes" as a Habitat Specific Plan Area and require a specific plan as detailed in Sand City Ordinance 84-7. This specific plan will provide for requirements as delineated in Sand City zoning ordinances

for habitat restoration, transfer development credits, and planned unit developments. (see section 4.2.1 for contents of specific plan for East Dunes).

c. City of Sand City will implement all necessary legal documents and city resolutions and/or ordinances establishing a Habitat Maintenance District (HMD) The HMD could take the form of an assessment district or a Mello-Roos district which will authorized to collect, hold and distribute funds collected from HCP financing mechanisms.

The boundaries of the HMD will be determined in concert with the Service so as to determine the benefit and impact as determined in the final boundaries of the developable and conserved habitat areas.

d. City of Sand City will implement all necessary legal documents and city resolutions and/or ordinances to require all property owners in HCP Habitat Area B, C, and D to implement financing and habitat conservation efforts as part of any development application submitted to the City.

e. City of Sand City will submit "Mitigation Agreements" (MA) as required by the California State Department of Fish and Game (DFG) under Section 2081 of the Fish and Game code, for mitigation efforts associated with future Habitat Area A East Dunes take of rare or endangered plants.

Phase II: Pre-Mitigation
Year 0.5 to 1.5

a. City of Sand City will make several grant applications for funding various HCP components including conversion of Area E Highway 1 right-of-way planting (designated as Notes "A" and "O" on Figure 2, HCP Land Use Map) to native landscaping, and planting for rare and endangered plants and species in other appropriated sections of the plan for corridor connections and stepping stone habitat areas. The grants will request funds for both land acquistion (fee and easement) and installation, monitoring, and management. The initial grant applications will be to the following agencies:

1. State of California Habitat Conservation Fund (HFC) from Department of Parks and Recreation. These monies will fund land acquistion and the habitat planting and management process.

2. California Resources Agency Environmental Enhancement Fund under the "Resources Lands" and "Roadside Recreation" categories. This grant, if funded, will first assist in native planting for dune stablization in the area of the new Sand City bicycle path. A second or third year grant application maybe submitted to

request funds for habitat revegetation and land acquistion. These funds are awared to projects which provide additional environemental mitigation for local transportation projects.

b. At approval of a Habitat Maintenance District (HMD) an implementation fee shall be collected to fund pre-mitigation efforts for planting dune gilia in Sand City, or at off-site areas such as Fort Ord or Marina State Beach, or other dune gilia areas. The fee could also be use to purchase private land with threatened rare or endangered species in more appropriate areas.

c. Habitat conservation budget is prepared by City and the HMD for all habitat areas, detailing each area's costs and property owner's assessments. The budget shall include costs for:

* site preparation
* seed collection
* plant propagation and purchase
* planting
* netting and erosion control
* signage and fencing
* maintenance
* monitoring

d. Habitat pre-mitigation has already proven successful at the Sand Dollar Shopping Center, as required by the City's LCP and General Plan, and imposed on the shopping center as a condition of project approval (See Figure 2, Note "U"). This 7.6 acre enhancement area is considered by the City as an existing habitat pre-mitigation area for use in creating mitigation credits for anticipated incidental take in the East Dunes. The exact amount of pre-mitigation credits is to be determined in negotiations with the Service.

Phase III: Habitat Restoration and Planting
Year 1.0 to 2.0

a. The Habitat Area A east dunes habitat corridor restoration and enhancement (ice plant removal and new native planting, including rare and endangered plants), will begin after approval of the HCP by U.S. Fish and Wildlife Service (Service) and DFG, and after establishment of the specific plan and the HMD. The area shall be fenced and protected from any construction activity.

b. Restoration of Habitat Area B, north of Tioga and east of Highway 1 habitat area designated as Note "S" on Figure 2, shall begin at the approval of the HCP and the HMD.

c. Establishment of new habitat areas in Area C west of Highway 1 - north of Tioga Avenue, will occur at the time of

individual project development implementation, after having been issued a coastal development permit. If appropriate some projects as part of conditions of approval could begin habitat planting prior to construction if appropriate.

d. Establishment of new habitat areas in Habitat Area D west of Highway 1 - south of Tioga Avenue, will occur at the time of individual project development implementation, after having been issued a coastal development permit. If appropriate, some projects as part of conditions of approval could begin habitat planting prior to construction if appropriate.

The area designated for habitat preservation on the HCP map which is owned by the State Park and Recreation should be designated as habitat conservation areas in any state park plan for the area and used for rare and endangered plants. This would require passive recreation, signage, and avoidance of public use which could interfere with successful habitat protection and conservation.

e. Mitigation Monitoring and maintenance will occur over the next four years funded by the HMD and managed by the City Manager.

Phase IV: Development Activities
Year 2.0 to 5.0

a. Habitat Area A Re-development project can occur in the developed non-habitat areas of the specific plan boundary at any time. This could include new replacement PUD development in areas of existing development (open storage areas or existing homes) earmarked for redevelopment; and where no habitat currently exists or where there is no designated areas for new habitat planting.

b. The city can accept development applications for projects in Area A after legal agreements are signed, a specific plan is approved, the HMD is established and fees paid, and pre-mitigation measures are instituted in the following areas:

* Caltrans habitat corridor (designated as Notes "A" and "O" on the Figure 2);
* Area B habitat reserve (Note "S" on Figure 2) is begun;
* Area A corridor (Note "W" on Figure 2) is established and monitored.

c. Development in all other habitat areas of the city can occur if there is no take of rare or endangered species or if the projects have satisfied all planning and environmental documents required by the City if they are within or adjacent to habitat corridors and habitat stepping stone areas. This may include habitat set-aside areas within the project boundary and may include habitat enhancement and protection for those areas.

4.7 Plan Administration

The City of Sand City will administer the provisions of the HCP and will provide coordination with all agencies which will oversee the implementation of the HCP. Funds to administer the HCP will come from developer mitigation fees and the Habitat Maintenance District assessments. Operation of funds will come under the administration of the City Manager and City Council of Sand City, who will authorize fund dispersals. Costs of administration will be calculated at 10% of implementation and monitoring costs and will be funded through the development fees.

Sand City will implement the HCP through contracts with private or non-profit organizations or agencies. Such an organization or agency shall be required to have a biologist on staff or, to contract with an outside biological consultant to monitor the implementation of the conservation program and determination of when the HCP has met its goals. The Sand City Police Department would be responsible for enforcement of ordinances and monitoring patrols.

The activities listed below will be administered by the City of Sand City.

4.7.1 For Habitat Areas

4.7.1.1 Long-term Restoration/Enhancement and Ongoing Maintenance

Restoration of degraded dune habitat will be a long-term project in Sand City. Just as the present degradation took many years, many more years will be required to restore the dunes. Providing ongoing restoration and enhancement activities is required to accomplish long term restoration goals. The annual funds generated by the homeowners assessment will generate a level of funding which provides for continuing efforts of exotic species control, habitat enhancement, and habitat maintenance. The City should determine an appropriate level of effort for the achievement of specific annual restoration goals. The annual effort should be tied to long-term restoration goals.

Once established, native vegetation requires little maintenance, but there will be a need to remove re-invading exotic species from the re-vegetation areas. On-going maintenance will be necessary to repair damage from unauthorized public use. Seedlings of undesirable plants are easy to remove by hand if they are caught early. Once they are well established it becomes more difficult to removed them without damaging desirable species. Sites should be checked for signs of erosion instability. Fencing, re-contouring, or additional planting in unstable areas may be required to avoid the start of blowout conditions. Provision will also be made for trash removal.

4.7.1.2 Habitat Protection

If an HCP can be finalized that is acceptable to the City Council, the City would assure that the habitat remains inviolate from trespassers, off-highway vehicles, dumping, and other activities which may degrade habitat.

4.7.1.3 Species Monitoring

An ongoing, low-intensity monitoring program should be established to assess the status of the populations of the rare, threatened, and endangered species. The exact methodology will be worked out in consultation with the US FWS and CDFG, and will be revised from time-to-time to reflect changing conditions, new techniques, budgetary constraints, and the results of past surveys. The general need is for a low level of status survey -- the purpose is to adequately track performance under the HCP, but to reserve the vast majority of Plan funds for habitat management and enhancement.

Smith's blue butterfly monitoring should consist of performing transects during the Smith's blue adult flight season, recording the location of each individual sighting, the animals physical condition, sex, weather condition at the time of the survey, etc. By maintaining accurate records of transect lengths and times annual estimates of relative population sizes can be determined.

The plants and animals that are threatened and endangered should be monitored each year by doing a census of their number and condition. Documentation on status of existing populations should be kept separate from any new outplantings.

4.7.1.4 Reporting

The incidental take permit issued under Section 10 (a) requires an activities report submitted to the U.S. Fish and Wildlife Service by 31 January of each year. The report should be prepared and submitted by the City.

4.7.1.5 Public Use Monitoring

The City shall provide limited enforcement against unauthorized public use and trespass in the HMD area.

4.7.2 For Development Areas

4.7.2.1 Perform Plan Compliance Checks

Prior to approval of any project in the HCP area, the City of Sand City shall evaluate the project for compliance with the HCP. As part of the compliance check the City will:

- review final grading plans for consistency with the HCP,

- o review all restoration and exotic species management plans for conserved habitat,
- o review biology of threatened and endangered species such that planned development will take place in a manner to minimize the take of these species,
- o review buffer/corridor plantings and fencing specifications,
- o determine participation in funding program,
- o review CC&R language regarding habitat restrictions, and
- o assure that adequate bonding or other appropriate measure is established through the City of Sand City grading permit.

After the City obtains all necessary compliance materials, it shall immediately send the materials out to other agencies for review. Review agencies will include: the U.S. Fish and Wildlife Service, the Calif. Dept. of Fish and Game, and Calif. Dept. of Parks and Recreation. Each agency will have 45 days to review and comment on the compliance materials. After the 45 day period the City may hold a public hearing on HCP compliance. This hearing can be held concurrently with a scheduled public hearing set to consider other aspects of project approval.

4.7.2.2 Hold Pre-Grading Conferences

Upon the City's issuance of a building/grading permit for a project, the Planning Director will hold an on-site pre-grading conference with the developer and grading/construction contractors. The habitat fence and warning signs must be up in any areas where grading or disturbance will take place within 200 feet of conserved habitat. At the pre-grading conference the Planning Director will explain the consequences of grading or disturbing any conserved habitat, and will have grading contractors/personnel sign grading acknowledgements.

4.7.2.3 Fund Administration

The City will collect, administer and disperse assessment fees generated through the Habitat Maintenance District. Prior to dispersing funds each year the City will prepare a summary financial statement of the fund and a proposed budget allocation for the coming year. The City will submit this report to the USFWS, CDFG, and CDPR for review and comment. The City will perform the following activities associated with HCP and HMD funds:

a. Hold, use, operate and administer the conserved habitat according the provisions set forth in the Section 10(a) permit and HCP.

b. Monitor the effect of all activities within the development areas as they relate to the HCP.

c. Provide advice and direction, in a timely manner, to landowners with regard to HCP compliance.

d. Review and comment on restoration and exotic species control plans submitted by landowners.

e. Collect, administer and disperse interim and permanent habitat fees as necessary to implement the HCP.

f. Process offers of land dedications or habitat easements within conserved habitat if restoration performance standards are met.

g. Provide an annual report of HCP related activities to the U.S. Fish and Wildlife Service as specified ı the Section 10(a) permit.

4.7.2.4 Provide Restoration and Development Supervision

The restoration programs undertaken by each landowner upon issuance of the Section 10(a) permit should be carefully supervised by the City. Plant material, seeds and equipment should be inspected to be sure they conform to the specifications. All treated areas should be carefully inspected to be sure a thorough and proper job has been done. The contractor must be familiar with the sensitivity and degree of precision required by revegetation as compared to conventional landscaping.

4.7.2.5 Evaluate Restoration/Enhancement Success

Evaluate restoration and enhancement success according to Standards set forth in HCP. Standards should be set up for the evaluation of restoration success, particularly in development areas where landowners will become free from further restoration obligations (including payment of bonds or other security) once the program has been completed. The following performance standards apply to Sand City.

- Restoration area is in a stable condition, with no apparent erosion. Bare sand is acceptable, but not such that the area is likely to become a blow out.

- Ground cover of restored vegetation exceeds 50%.

- At least 75% of the species specified in the restoration mix have become established on the site.

- Restoration area has become self-sustaining (native plants are producing seed and re-establishing themselves naturally).

- There is a minimal amount of non-native species (less than 20%) in the restored area.
- Populations of animal species of concern associated with adjacent areas are present in the area.
- There is a minimal amount of maintenance required.
- No condition exists which creates a liability for personal injury or property damages or which is contrary to law.

4.8 HCP Financing

The funding for the HCP involves a variety of sources, both public and private. In many cases the acquisition of land for conserving existing sensitive habitat and land for enhancing and creating new habitat areas will involve the following:

* Use of land set-aside as a condition of project approval, no direct outlay of capital,
* Redevelopment property tax pass-through,
* State and federal habitat acquisition programs,
* Non-profit agencies acquisition programs,
* Caltrans Environmental Enhancement grants.

The funds will be collected and administered through a Habitat Maintenance District, and other appropriate means as listed below.

4.8.1 Land Set-aside

In the case of land set-aside by property owners, habitat area will be acquired for the HCP program as:

* part of the conditions of project approval for development project, both public and private, on the west side of Highway 1, Habitat Planning Area C and D; or
* part of Habitat Planning Area B, just north of Playa Avenue (Notes "Q" and "S" on Figure 2, the HCP Land Use Map) which will be part of habitat enhancement set-aside, as authorized by this HCP, in conjunction with Phase II development of the Sand Dollar Shopping Center and father development north of Sand Dollar (Calebrese and Granite Construction sites).
* part of habitat buffer zones/native landscaping as provided by master developer in the East Dunes under planning requirements under the specific plan.

4.8.2 Redevelopment Agency Tax Pass-through

The whole of Sand City is included within the boundary of the Sand City Redevelopment Agency boundary. As such, development projects in the city can benefit from state

redevelopment law which allows the city to financially assist property owners in improving their land and in meeting the goals of the Redevelopment Agency. If approved by the City Council property owners in the East Dunes can be compensated for project development and habitat land set-asides, as part of the transfer density credit program, by use of the Sand City Redevelopment Agency property tax pass-through provision. These provisions allow the city to finance part of the land costs associated with new development, either for construction, land costs, or in the case of the HCP for land set-aside of habitat preservation.

4.8.3 State Habitat Land Acquisition Programs

Habitat land acquisition programs have been approved by the voters of California including parkland acquisition funds and the Wildlife Protection Act of 1990 (Mountain Lion Initiative-Proposition 117) which established the Habitat Conservation Fund.

These as well as state monies under the Wildlife Conservation Board's program for rare and endangered species land acquisition will be applied for under the HCP and will assist in habitat land acquisition for the East Dunes and other existing habitat areas (Area B, north of Playa Avenue).

The state Coastal Conservancy also has a habitat protection component under their Public Access Program which can be use for habitat land acquisition.

The HCP will form the basis of an application to the these state programs and will be applied for concurrently with adoption of the HCP.

4.8.4 Non-profit Agencies Acquisition Programs

Non-profit agencies can be utilized for habitat land acquisition funding and these include:

* Nature Conservancy
* Trust for Public Land
* Planning and Conservation League Foundation
* Other foundations concerned with protecting rare and endangered species.

4.8.5 State Resource Agency Grants

Several grant opportunities exist for funding of projects in support of the City's HCP program. These include the "Environmental Enhancement Mitigation" (EEM) program and the Parks and Recreation's program for habitat preservation. Grants can be made for land scquisition, planting, and maintenance.

Previously the City made application to the Resources Agency for funding in 1990-1991 to revegetate the Caltrans Highway One ROW under EEM. Caltrans agreed to provide on-going maintenance

if this grant was funded (see Appendix E). The Agency denied this grant request due to the EEM restrictions on funding projects which did not utilize trees in highway ROW areas. The City subsequently appealed to the Agency to allow funding for projects in areas which do not support trees such as the coastal dunes of Sand City, but was denied.

Funding for planting of natives outside the ROW is allowed and the City has applied under EEM 1993-1994 for funding of the coastal dunes area adjacent to the new Sand City bike path which was funded under the Agency's Proposition 116 funding allocation. The EEM application request monies for land acquisition for slope easements and a 50 foot coastal native plant revegetation and dune stabilization next to the new bike path and Sand Dunes Drive. Both are adjacent to Highway One ROW.

The grant funds, if awarded, will provide for ice plant removal, straw plugs and mats for dune stabilization, hydroseeding, and planting of coastal dune natives. At this time, RTE plants or species will not be introduced. Future coastal dune revegetation could include RTE plants when specific development envelopes are established and projects are approved with conditions for RTE enhancement as part of the HCP corridor program.

5. HCP ALTERNATIVES AND BIOLOGICAL ASSESSMENT OF THE PROPOSED HCP AND ALTERNATIVES

5.1 Proposed HCP

Refer to Section 4 for the description of the Proposed HCP.

5.1.1 Impact to Species of Concern

The proposed HCP would result in the loss of approximately 13 acres of low quality habitat which supports the Smith's blue butterfly at the East Dunes and the Sand Dollar Phase II site. This represents almost 37% of the habitat that exists in Sand City. This could contribute to the ultimate extirpation of a resident population of the species in Sand City since it would cause further reduction of habitat availability in an already marginal area. However, this loss is not considered significant to the long-term survival of the butterfly throughout its range.

The proposed HCP would result in the loss of about 13 acres of land supporting a 1991 population of about 11,000 dune gilia plants. Less than 500 dune gilia plants (1991 estimate) would be preserved at the East Dunes. This loss would reduce the population of dune gilia in Sand City by more than 90%, thus jeopardizing the long-term survival of this species in Sand City.

There would be some loss of black legless lizards and its relatively poor quality habitat at Sand City.

The proposed HCP would provide for the establishment of a series of habitat "stepping stone" corridors along the north\south length of the City on both the east and west side of Highway 1. The corridor will facilitate the dispersal of Smith's blue through Sand City to both the north and the south, thus maintaining and improving the areas value as a dispersal corridor. This component meets the goals of the Smith's Blue Butterfly Recovery Plan. In addition, remaining Smith's blue habitat in Sand City will be protected, enhanced and monitored on an annual basis in perpetuity.

The proposed HCP will also provide funding for the establishment of dune gilia and habitat for Smith's blue in habitat corridors and other appropriate areas elsewhere on or off-site.

Data on propagation and re-establishment of the dune gilia is still developing. Establishment of new area for the dune gilia will most likely be planned for enhancement in all areas plannned for revegetation in the HCP, as well as in set-aside areas in Fort Ord which could be used as part of a Mitigation Banking Program.

5.2 Alternative 1: No Project -- No HCP, Status Quo

Under this alternative the City would not seek or obtain a Section 10(a) permit from the U.S. Fish and Wildlife Service to allow the incidental take of the Smith' blue butterfly.

The No Project Alternative would occur under the following circumstances:

- o The Proposed HCP is denied by the USFWS as inadequate mitigation for a 10(a) take permit;
- o There is no reasonable compromise reached with the USFWS for preservation and development in Sand City;
- o Much of the East Dunes residential area containing sensitive and endangered habitat is not allowed to develop because of endangered species;
- o The City does not continue its efforts to obtain a Section 10(a) permit;

As a result of no HCP being implemented, the City would be placed in a situationof having to approve separate individual development proposals (maybe as high as 250 in the East Dunes alone) and condition each approval for biological assessment and subject to final approval from USFWS if endangered habitat exists on the property. This is a very poor planning option both for the community and the chance for survival of native habitat and associated species.

This would result in a tremendous amount of work for the City, the property owners and especially the USFWS. It could be detrimental to the survival of the Smith's blue butterfly as this piece-meal development process would be slow and would allow inadvertent habitat destruction to continue from invasive iceplant and commercial, industrial, public recreation activities, and random vandalization in the area of habitat.

Project development approvals in areas of sensitive habitat could be mitigated through environmental assessments such as mitigated Negative Declarations or Environmental Impact Reports. This is less than desirable as mitigation would be piece-meal and not integrated into a larger city wide approach.

5.2.1 Impact to Species of Concern

Under the No Project Alternative, degradation of endangered, rare, and threatened species and habitat would continue in Sand City. Long-term species survival of the Smith's blue butterfly, dune gilia, and black legless lizard at Sand City would be threatened. Ultimate extirpation of the resident population would result from the No-Project Alternative. The on-going degradation from non-native invasive and aggressive ice plant

would continue and its dominance (over 70% coverage in some areas) would increase.

In addition, there would be little opportunity to establish permanent habitat corridors for gene dispersal of Smith's blue butterfly from the Ft. Ord and north Sand City colonies to southern colonies in Monterey. This could result in the ultimate isolation of populations found both to the north and south of Sand City.

5.3 Alternative 2: Maximum Conservation of Existing Habitat

This alternative would consist of setting aside most of the primary habitat areas remaining in Sand City (Figure 9). Some take would occur through limited development around the eastern and southern periphery of the East Dunes. This alternative would preserve much of the remaining rare and endangered species habitat in Sand City. All other components of the proposed plan apply to this alternative, except for the provisions of setting up a Planned Unit Development (PUD) in the East Dunes. This would no longer apply since the development area would be significantly reduced from the proposed HCP. Development taking place in the periphery of the East Dunes would be subject to HCP requirements relating to paying mitigation fees (to be determined), and erecting habitat protection fences at the boundary between development areas and habitat areas.

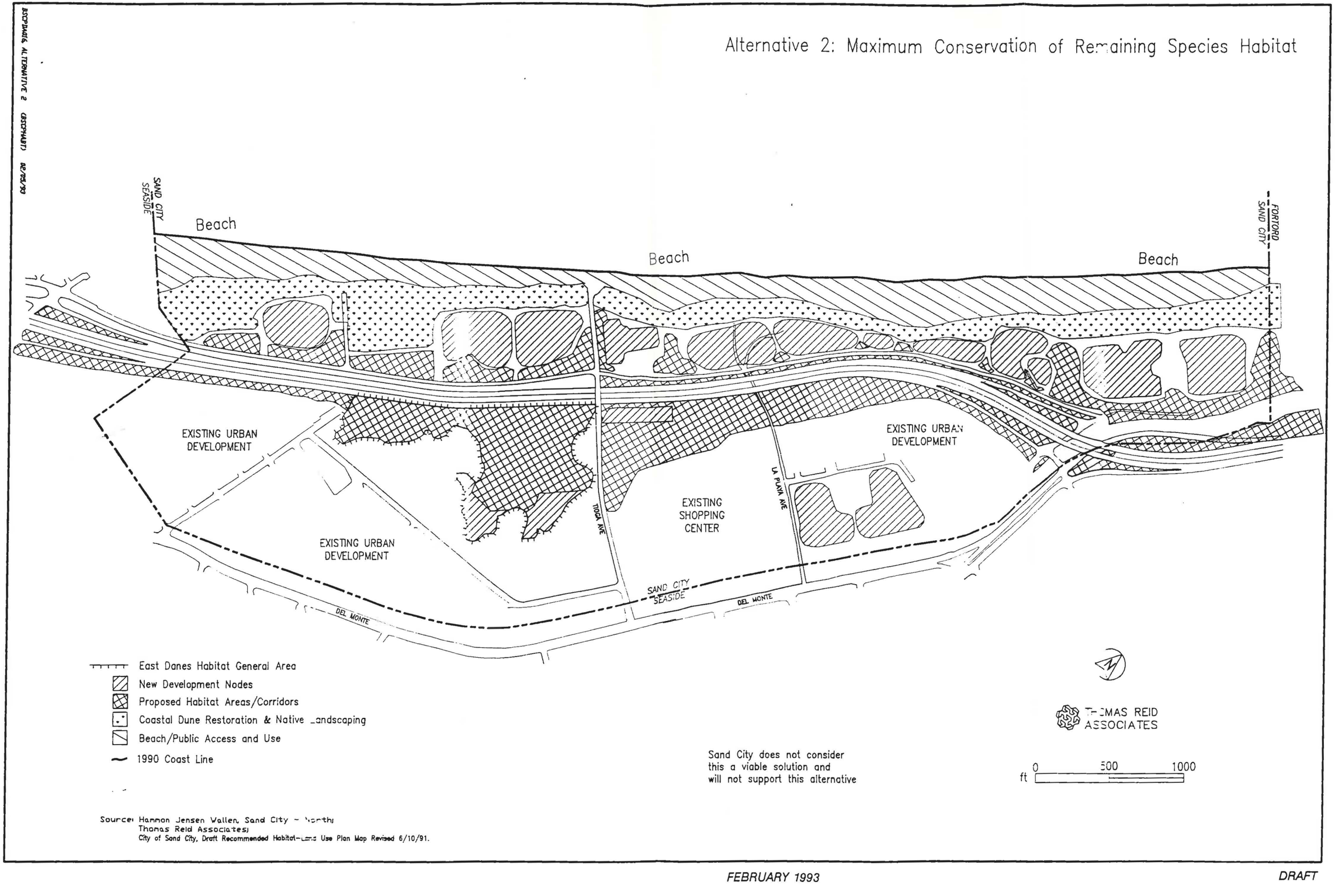
Under this alternative, the City would lose a large piece of the City contemplated for residential development. According the City, this development is key in upgrading the City's housing stock and increasing City revenues. Most of the private property owners would lose the opportunity to develop their land and would be subject to monetary compensation for this loss. Thus, this alternative is unacceptable to the City.

Public purchase of habitat would likely be difficult and expensive. Mitigation fees generated by private projects on the east and west side of Highway 1 could generate some funds which could help pay the costs of purchase of the East Dunes habitat preserve, however it clearly would not be enough for total purchase of the land and to pay costs of critically needed restoration and enhancement activities. Funding from other sources would have to be obtained to make this alternative feasible.

5.3.1 Impact to Species of Concern

Maximum conservation of existing habitat would reduce the take of both Smith's blue butterfly and dune gilia from that contemplated under the proposed HCP. Only about 3 acres of low quality habitat supporting the Smith's blue butterfly would be lost; this represents about 8% of the total habitat area in Sand City. In addition, 3 acres of low density dune gilia habitat supporting roughly 1500 plants, or 13% of the 1991 population,

FIGURE 9 -- ALTERNATIVE 2: MAXIMUM CONSERVATION OF EXISTING HABITAT



would be lost. This loss would increase the amount of time that both species would survive in Sand City over the proposed HCP, however, it may not necessarily improve the ultimate long-term survival of the species there, due to the high degree of habitat degradation and isolation which has already taken place.

Since a large part of the funding for this alternative would have to come from outside sources, the chances for success in obtaining the land necessary for creating a large East Dunes habitat preserve may be low. Therefore, this alternative has questionable economic feasibility.

5.4 Alternative 3: High Density Habitat Preservation in the East Dunes

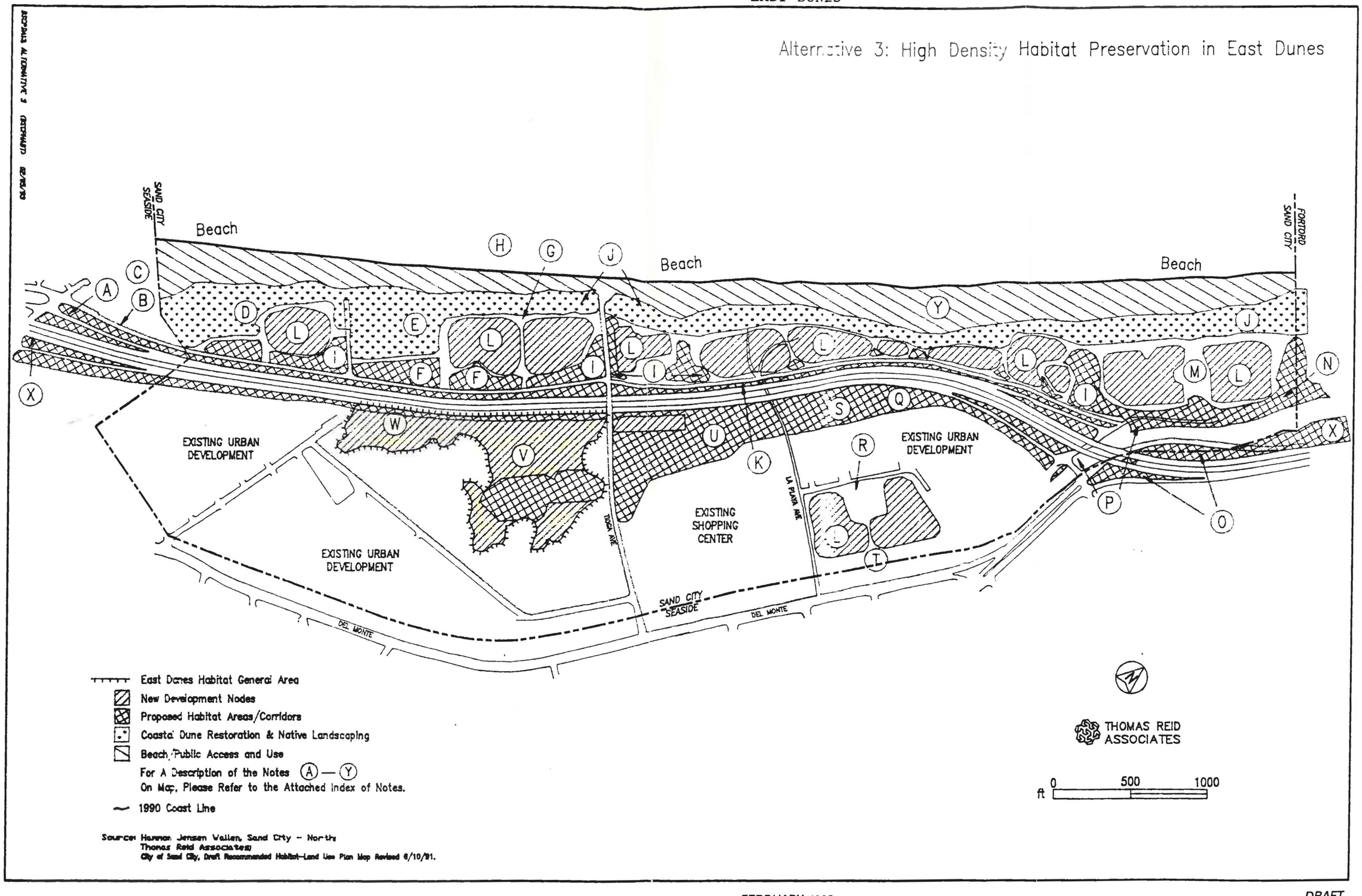
This alternative is based on preserving an estimated 3.8 acres of high density habitat in the middle of the estimated 16.5 acre East Dunes rather than preserving a long strip of habitat along the western edge of the dunes adjacent to the Caltrans right-of-way (Figure 10). The selection of the area of higher density habitat to preserve was based on analysis of data collected by Arnold in 1991. Development would occur on the estimated 12.7 acres of the East Dunes. All other components of the proposed plan apply to this alternative.

The habitat area set-aside in the center of the East Dunes contains much of the highest density of both dune gilia and coast buckwheat plants as determined in 1991 by Arnold (refer to Figures 4 and 6 in Section 2). The development area would comprise 12.5 acres and would surround the set-aside on the eastern, western and southern boundaries. The northern boundary of the set-aside abuts Tioga Ave. and is directly across the road from the 7.6 acre pre-mitigation habitat preserve located at adjacent to the Sand Dollar Phase I.

It may be possible to convince the City Council to accept this alternative if the three major property owners in the East Dunes are willing to participate in the program. If so, the City would then work with the property owners and master developer to assist in the implementation of this alternative. This alternative involves more extensive use of transfer development credits and cooperation of the City for use of paper streets within the habitat and development envelopes.

The key advantage of this alternative is that it would result in less take of valuable habitat for the dune gilia and Smith's blue butterfly by preserving the higher density areas. However, it would result is a less desirable development envelope.

FIGURE 10 -- ALTERNATIVE 3: HIGH DENSITY HABITAT PRESERVATION IN EAST DUNES



5.4.1 Impact to Species of Concern

This alternative would result in the loss of about the same amount of land area which supports the Smith's blue, dune gilia, and black legless lizard as the proposed HCP. However, the area of land preserved under this alternative supports the highest density of Smith's blue butterfly and dune gilia. Thus, the take of individuals would be significantly lower under this alternative. In particular, the number of dune gilia plants lost due to development would be reduced from 11,000 for the proposed HCP to 2,500 (1991 estimates), a 77% reduction.

This alternative, however, would contribute to further isolation of the species populations since it would allow development to occur on three sides of the habitat preserve. In addition it would reduce the width of the habitat corridor on the east side of Highway 1 which ranges from 60 to 180 feet under the proposed HCP to 35 to 40 feet, the existing Caltrans right-of-way.

As with the maximum habitat conservation alternative, this alternative would increase the length of time that both species would survive in Sand City over the proposed HCP, however, it may not necessarily improve the ultimate long-term survival of the resident population species there. However, it should be noted that due to the existing fragmentation and degradation of habitat in Sand City, the long-term survival of the rare and endangered species in Sand City is uncertain under any circumstances. But, as stated earlier, this loss is not considered significant to the long-term survival of the SBB throughout its range. This alternative is more favorable to the dune gilia than is the Proposed HCP since it significantly reduces take of this plant.

5.5 Alternative 4: Regional Habitat Mitigation Program

Because of the urban nature of Sand City and the poor quality habitat which exists there, the City would like to promote an additional alternative strategy for the HCP. In addition to the habitat areas which are proposed to be re-created and enhanced in Sand City, the City would like to participate in the establishment of a regional habitat preserve which could be developed in more suitable and pristine area of the Central Coast.

The Fort Ord Reuse Plan currently being developed as part of the base closure process, includes a Regional Habitat Mitigation Program. The program proposes that areas or program elements be made available for additional mitigation, besides those areas needed to mitigate impacts of any new Fort Ord development as proposed by the cities of Marina, Seaside, and Monterey. Such a program would be beneficial to Sand City, as it would provide a means whereby Sand City can obtain additional mitigation credits through financial participation in the Fort Ord Regional Habitat Migitation Program. See Appendix F for Mitigation Guidelines prepared by the California Native Plant Society and Appendix G for a summary of the program.

5.6 Impact Comparison of Proposed HCP and Alternatives

IMPACT COMPARISON OF PROPOSED PLAN AND ON-SITE ALTERNATIVES *					
	PROPOSED LAND USE PLAN	ALTERNATIVE 1 NO PROJECT	ALTERNATIVE 2 MAXIMUM CONSERVATION	ALTERNATIVE 3 HIGH DENSITY CONSERVATION OF EAST DUNES	ALTERNATIVE 4 PARTICIPATE IN REGIONAL PROGRAM
EXISTING HABITAT AREA	36 acres	36 acres	36 acres	36 acres	36 acres
HABITAT LOST High or Low Quality	High- 3.8 acres Low- 9.7	0 acres	High- 0 acres Low- 3 acres	High- 0 acres Low- 12.7 acres	High- 3.8 acres Low- 9.7
PERCENT HABITAT LOST	37%	0%	8%	36%	37%
ULTIMATE HABITAT PRESERVED AND/OR RESTORED	70 acres	uncertain	uncertain	70 acres	70+ acres
COMMENTS:	WOULD RESULT IN A BETTER DEVELOPMENT ENVELOPE IN EAST DUNES THAN HIGH DENSITY ALT.	WON'T RESOLVE ENDANGERED SPECIES CONFLICT; CONTINUED HABITAT DEGRADATION	OUTSIDE FUNDING NEEDED TO MAINTAIN HABITAT AND PURCHASE PRESERVES	HIGHER DENSITY HABITAT PRESERVED OVER PROPOSED PROJECT	COULD FINANCE ADDITIONAL MITIGATION AT FORT ORD HABITAT PRESERVE

* All figures approximate

6. ASSUMPTIONS AND GENERAL LIMITING CONDITIONS

6.1 Basic Assumptions

The realities of dealing with endangered species issues are complex and often frustrating from the perspective of local planning agencies and property owners. Frequently the rules seem to change and get more complicated as you proceed into a conservation planning program. In Sand City, the basic assumption was made (after years of difficulties with habitat issues) to try to develop a city-wide habitat conservation plan.

Approval and implementation of an acceptable HCP would enable the City (and it's property owners) to realize three major goals:

1. provide for new development,

2. implement its State approved redevelopment plan, and

3. achieve a workable and achievable conservation program for the rare, threatened, and endangered ("RTE")species located within the City.

There is an honest belief by the Sand City Staff and the City Council that an acceptable HCP or conservation agreement (through a Section 7 consultation) is a possible achievement -- that a balance can be struck between development and conservation with a carefully structured plan. From an environmental perspective, it may be more desirable to not disrupt any of the habitat areas in Sand City; however, the financial reality is that there is not a serious long-term way to afford full protection of the East Dunes habitat area. In fact the Endangered Species Act was modified to allow a "incidental taking" of such species in cases where avoidance of species is not entirely possible.

Sand City believes that its proposed HCP is achievable and will provide a habitat program that will enhance the long-term survival of the RTE species in this area. It is not possible for Sand City, under present constitutional law, with existing resources, to simply set aside the entire East Dunes as permanent open space. Limited resources in Sand City do not provide for an HCP that will put the City in the position of "inverse condemnation" of this entire area of the City. Nor, is it the City's intention to simply put aside its redevelopment and housing plan and goals, which call for residential development to occur in the East Dunes. A balance is essential to both the City, the U. S. Fish and Wildlife Service, and the RTE species.

6.2 Limiting Conditions

The City of Sand City and Thomas Reid Associates ("TRA") have made extensive efforts to confirm the accuracy and timeliness of the information contained in this Habitat Conservation Plan (HCP). Such information was compiled from a variety of sources, including private property owners, interviews with government officials, review of legal and habitat research documents, field surveys and site monitoring studies, consultation with scientific experts, and other third parties deemed to be reliable.

Although Sand City and TRA believes all information in this HCP is correct, it does not warrant the total accuracy of such information, and assumes no responsibility for inaccuracies in the information by third parties. Although additional data may be relevant to this study, some may not be included in this HCP.

As such, the city of Sand City and TRA have no responsibility to update this report for events and circumstances occurring after the date of the report. Further, no guarantee is made as to the possible affects from development of present or future federal, state, or local legislation, including environmental or ecological matters.

The components in the HCP for mitigation of impacts to rare or endangered species, are based on estimates and assumptions developed in conjunction with the third parties. They provided the most up-to-date information available, however, it is the nature of habitat conservation planning that some assumptions may not materialized and unanticipated events and circumstances may occur (such as a major storm, or prolonged freeze or drought, etc).

Therefore, actual results of the HCP may vary from the projects and some of the variations may be material to the conclusions of this analysis. The HCP is designed to anticipate unforeseen events through its monitoring program and flexible approach to creating funds and areas available for habitat mitigation.

The HCP proposes measures which are complex but are "do-able" with the cooperation of property owners, the Service and the City. However, because Sand City is a small part the habitat network in central California, even 100% success of the HCP will not necessarily guarantee the survival of the species in this plan.

For this reason, perhaps the best mitigation that can be developed by Sand City would be to start a regional mitigation banking program, as presented in the proposed HCP as Alternative 4, "Regional Habitat Mitigation Banking Program".

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7.2 Persons Consulted

Richard Arnold, Entomological Consulting Services
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Bruce Elliot, CDFG, Monterey
James Heisinger, Attorney at Law
Deborah Hillyard, Calif. Dept. of Fish and Game
Kent Julin, Harding Lawson Associates
Ed Lorentzen, USFWS, Sacramento
Jack Massera, Agronomist, U.S. Army, Fort Ord
Dennis Murphy, Center for Conservation Biology
Chris Nagano, USFWS, Sacramento
Constance Rutherford, USFWS
Robert Thornton, Attorney at Law

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David Wilson

7.5 Habitat Task Force Advisory Committee (TFAC)

Voting Members:

David Pendergrass, Sand City Mayor
Jim Carnitato, Attorney at Law and property owner
Bruce Elliot, State Fish and Game
Cathy Francini, Councilmember/property owner (to June 1991)
Michael Morris, Councilmember/property owner
Mark Ferguson, California Native Plant Society
Michael Groves, EMC Planning Group Inc.
Gloria Kauhanen, Sierra Club
George Robinette, Monterey Sand Company/property owner
Ed Lorentzen, USFWS
Dennis Carlson, USFWS
Ellen Dillon, USFWS
Chris Nagano, USFWS

Kelly Morgan, Sand City Planning Director/Chariman of TFAC
Mary Wright, State Parks and Recreation

Technical Advisors:

Mark Wheetley, California Coastal Conservancy
David Loomis, State Coastal Commission
Gary Ruggerone, Caltrans District 5

Alternatives:

Victor Roth, State Parks and Recreation
Joey Dorrell, Native Plant Society
Janie Figen, Sierra Club
Harry Hicks, property owner
Cris Steadler, EMC Planning Group

APPENDIX A

SAND DOLLAR SHOPPING CENTER

BIOLOGICAL RESOURCE MANAGEMENT PLAN

RESOLUTION #SC-8 (1989)

ORIGINAL 4

RESOLUTION NUMBER SC- 8 (1989)

RESOLUTION APPROVING BIOLOGICAL RESOURCE MANAGEMENT PLAN FOR CERTAIN PROPERTY OWNED BY MONTEREY SAND CO. WITHIN THE CITY OF SAND CITY.

WHEREAS, Monterey Sand Co. owns certain property within the coastal zone in the City of Sand City located north of Tioga Avenue, south of La Playa Avenue, east of Highway One, and west of the Southern Pacific Railroad right-of-way, which portion within the coastal zone consists of that portion of the above-described area located within two hundred feet east of the Highway One right-of-way and one hundred feet west of the Southern Pacific Railroad right-of-way; and

WHEREAS, a portion of said property within the coastal zone located within two hundred feet easterly of the Highway One right-of-way contains sensitive habitat as defined in the Sand City Local Coastal Program (Sand City LCP); and

WHEREAS, under the Sand City LCP, a portion of said property is designated with the Resource Management combining district in the LCP Land Use Plan, and classified as Coastal Zone Habitat Preserve with the Resource Management combining district in the LCP Implementation Plan, and another portion is designated as a Habitat Restoration Area in the LCP Land Use Plan and classified as Coastal Zone Industrial Park with a Habitat Restoration overlay district in the LCP Implementation Plan; and

WHEREAS, Monterey Sand Co. has caused to be prepared by Harding Lawson Associates a Biological Resource Management Plan for the above-described property in anticipation of consideration of a specific plan for a planning area that includes said property within the coastal zone; and

WHEREAS, said Biological Resource Management Plan was prepared in accordance with and satisfies the standards and requirements of the LCP Land Use Plan and the CZ-RM Resource Management Overlay District and CZ-HR Habitat Restoration Overlay District for the LCP Implementation Plan, in that it contains a biological field survey and a habitat protection plan prepared by a qualified biologist which includes:

1. A description of the type and location of existing native and other species;

2. Protection goals consistent with policy 4.3.21 of the LCP Land Use Plan;

3. Methods of controlling public access and eliminating invasive non-native species;

4. Irrigation, fertilization, and long term maintenance requirements, and methods of establishing new native plants (e.g., seeding, transplanting) and eliminating ice plant;

5. Mitigation measures for adverse impacts, such as loss of transplants to shock;

6. A schedule setting forth time requirements for plant establishment, dune stabilization, access controls etc.;

7. The management methods needed for installation, nurturing, and permanent protection of the restored habitat including but not limited to the method of establishment and the long term suitability of the restored habitat for the species;

8. Identification of the grading proposed for recontouring and/or dune stabilization;

9. Maximum feasible planting or protection of dune buckwheat (Eriogonum parvifolium and Eriogonum latifolium) as a food source for the endangered Smith's blue butterfly (Euphilotes enoptes smithi) and maximum use of native plant species; and

10. An implementation, management and maintenance component which provides for:

a. Fencing, signing or other appropriate access control measures to be installed as a condition of development; and

b. Initiation of restoration activities prior to occupancy of new development and completion of restoration activities within a five year period; and

c. Responsibility by the developer for habitat installation, maintenance and preservation for at least five years, and provisions for permanent preservation and maintenance of the sensitive habitat areas through contribution of funds by development and dedication of conservation easements on restored habitats to a public agency or private conservation organization with habitat management capabilities; and

WHEREAS, the Biological Resource Management Plan has been reviewed by the United States Fish and Wildlife Service and the California Department of Fish and Game; and

WHEREAS, the Sand City Council has reviewed and considered the Biological Resource Management Plan prior to consideration of approval of the proposed Sand City Regional Commercial Centers Specific Plan;

NOW, THEREFORE, IT IS HEREBY RESOLVED BY THE CITY COUNCIL OF THE CITY OF SAND CITY AS FOLLOWS:

1. The Biological Resource Management Plan for the Sand City Regional Shopping Center prepared by Harding Lawson Associates dated February 1, 1989, with Addendum #1 thereto, is hereby approved.

PASSED AND ADOPTED at the regular meeting of the City Council of Sand City on March 7, 1989 by the following role call vote:

AYES: Ritter, Francini, Pendergrass
Harper

NOES: None

ABSTENTIONS: None

ATTESTED:

John E. Harper
MAYOR

CITY CLERK

I am the City Clerk of the City of Sand City and hereby certify, under oath, that the within document is a true and correct copy of documents on file with the City.

Dated April 24, 89

Richard E. Goblirsch

ADDENDUM NUMBER 1:
BIOLOGICAL RESOURCE MANAGEMENT PLAN
SAND CITY REGIONAL SHOPPING CENTER, SAND CITY, CALIFORNIA

Prepared by:
Kirk Ford
Senior Biologist
Harding Lawson Associates

INTRODUCTION

In response to comments received from various state and federal resource agencies and from public comment during the public hearing on the final EIR, Harding Lawson Associates (HLA) would like to formally add the following items to the Biological Resource Management Plan. Added items include: 1) Revision of Figure 8 and acreages associated with Management Areas 2A and 2B; 2) Discussion of sheet pile installation and potential impacts associated with that installation; 3) Seasonal constraints on initial grading and construction; 4) Permanent fence design; 5) Installation of a public access and education center; 6) Temporary fence placement adjacent to Railroad right-of-way; 7) Monitoring Program (AB3180); 8) Changes in frequency of site inspection and monitoring; 9) Addition of a trash removal clause to maintenance requirements; 10) Adjustment of management prescriptions for Monterey gilia area; 11) Bonus Plan for Construction Supervisor; and 12) Minor adjustments in language within the report. The following provides discussion of each item.

RESPONSE TO COMMENTS

1) Revision of Figure 8 and acreages associated with Management Areas 2A and 2B

Figure 8, the summary of items in the biological resource management plan, has been revised to more closely register the management area boundaries with those of the proposed grading plan and of the proposed parcel map. This registration resulted in changes to the sizes of Management Areas 2A and 2B. Total area of permanently protected land included in Management Areas 1A, 2A, and 2B is 7.63 acres. No sensitive plant species, habitat areas, or listed endangered or candidate species are directly affected by these changes in Management Area boundaries.

2) Discussion of Sheet Pile Installation

Comments received expressed a concern regarding engineering and installation of the sheet pile and retaining wall. It has been suggested by the Ventana Chapter of the Sierra Club that installation of a sheet pile could result in densification of adjacent sand or cause nearby slopes to slough off. Additional concerns included the possibility of the impermeable sheet pile affecting the groundwater table.

HLA's Principal Soil Engineer was contacted regarding this matter. His comments, as well as those of the project's civil engineer are summarized as follows:

The sheet pile will be driven by power hammer into the sand approximately 12 feet to the west of the final retaining wall location. Vibration from pounding is expected to occur and densification of the sand would also be expected. However, shock waves from the pounding would be the greatest only within a

relatively short distance from the sheet pile. If one were to desire full densification of the sandy soils, piles should be driven every 10 feet or so. It is expected that soils farther than 20 feet away from the pile location would not increase in density. The nearest existing vegetation is at least 80 feet from the pile location and it is unlikely that these plants would be affected by densified soil associated with pile installation.

The groundwater table at the project site is well below the existing surface at the lowest part of the site (elevation 8.9 feet above sea level). On the slopes, the primary groundwater table is also at the same depth and flows towards the east. Some wet sands were found during soil borings on the slope, however, these are not part of the main groundwater table, but rather are remnants of water percolation from earlier storms. This moist subsoil zone would remain intact during sheet pile installation and surface grading and installation of the sheet pile is not expected to impede any groundwater flow into the habitat area.

3) Seasonal Constraints on Initial grading and Construction

Recommendations were made that all construction occur while the butterflies are in their larval stage. This phase lasts only for a few months of the year and it would be impractical to attempt to build only within such a limited window. U.S. Fish and Wildlife Service has no specific recommendations regarding seasonal constraints to development. There is no information to indicate that increased noise would be of concern for the butterfly, nor would blowing dust be expected to cause any significant effects (E. Lorentzen, FWS, pers. comm.). The temporary fences and other management plan constituents are designed to isolate the habitat areas from the construction zone and should provide adequate protection for the existing host plants and butterflies.

4) Permanent Fence Design

The Sierra Club, California Native Plant Society, and FWS have expressed concern over the design of the permanent fence which separates development areas from permanently protected Management Areas. The temporary construction fence will be made of chain link, wire, or snow fence and will be completely removed following construction. The permanent fence will be made of wood and steel mesh and will be compatible with a natural, park-like setting. Appropriate specifications will be provided at a later date. It is anticipated that the fence will include wooden 4" x 4" vertical supports with a horizontal 2" x 4" cross beam. Visually non-intrusive 6" x 6" steel mesh may be used between the supports. The fence will be about three feet tall and will follow the entire perimeter of the protected Management Areas. Gates will be provided at selected locations to allow access for authorized monitoring and maintenance personnel. Fence maintenance will be the responsibility of Monterey Sand Co. or its assignees and/or successors. If made of redwood or pressure treated lumber, the fence would be designed to last for approximately 25 to 30 years without major maintenance. If the fence were stained, it would likely require re-staining once every 5 to 10 years. Accidental damage or vandalism to the fence will be repaired as soon as possible following disturbance. Funds for maintenance of the fence are included in the five-year maintenance budget and would also be included in long-term maintenance funding mechanisms.

5) Installation of a Public Access and Education Center.

Both the Sierra Club and CNPS indicated that the best way to ensure survival of an endangered species is through education. To accomplish this goal, both organizations suggested that a public access and/or education center be

established on the project site to explain the restoration efforts and the biology of the area. To meet these requests, an area of about 15 feet by 20 feet has been set aside specifically for public access and education. The center is perceived to include a wooden overlook platform and perhaps an adjacent boardwalk or sidewalk. Interpretive signs would be placed strategically along the boardwalk and platform. The signs will be designed at a later date, but it is anticipated that they would include information about the ecology of the dune systems, the biology of the endangered and candidate species that are present on the site, and details about the restoration project. FWS requested that they be allowed input into design of the signs and offered suggestions that all signs be designed with a positive connotation.

6) Temporary Fence Placement Adjacent to Railroad Right-of-way.

A temporary fence was proposed within the railroad right-of-way to protect existing habitat values located within the right-of-way during construction of the project. Because construction equipment required some leeway for maneuverability, the fence was designed to be placed about 10 feet from the property line in the right-of-way. Comments received regarding this indicate that 10 feet may be too far, and that some sensitive habitat values could be affected. It was suggested by both CNPS and the Sierra Club that a five-foot setback be used, rather than the originally designed ten-foot setback. It is anticipated that construction equipment could work within the five foot setback for most of the length of the right-of-way. Ten feet will be required for construction of a small retaining wall along the first 160 feet immediately north of Tioga Avenue. All temporary fences will be placed with on-the-ground supervision of a qualified

biologist familiar with the site, and will be constructed with minimal damage to surrounding vegetation.

7) Monitoring Program (AB3180)

The Biological Resources Management Plan was designed to comply with AB 3180 which requires that a monitoring program be in place for any proposed mitigations. A formal agreement will be entered into between Monterey Sand Co. and the City of Sand City. The agreement will incorporate the Biological Resource Management Plan, and this addendum, and will be the legal mechanism by which implementation of the Resource Management Plan is ensured.

8) Changes in Frequency of Site Inspection and Monitoring

Monitoring during Construction. The Biological Resource Management Plan proposes that a qualified biologist or Game Warden inspect the site every day during the initial grading and retaining wall installation phases (pg 28) and once a month following initial grading (pg 30). It has been suggested by Sierra Club that monitoring after initial grading be more frequent than once a month. They have requested that inspections occur once a week during the entire construction phase. Because initial grading will effectively provide a set envelope for further construction of buildings and parking lots, we believe that site inspections on a random basis, once every two weeks will be appropriate.

Revegetation and Smith's Blue Butterfly Monitoring. A primary goal of the management plan is to provide habitat for the endangered Smith's blue butterfly. Dr. Richard Arnold, an expert on the biology of the blue butterflies has reviewed the plan and has offered specific suggestions concerning monitoring (R.A. Arnold, pers. comm., Feb. 27, 1989). His comments and suggestions are summarized as follows.

The butterfly's life cycle includes utilization of both seacliff and coast buckwheat by adults and larvae. The adults typically use older buckwheat plants (3 years old and older) with several flower clusters for feeding and ovipositing. Solitary plants generally do not produce enough flowers to sustain larvae until the plants are about 5 years old (although younger plants will be used if planted in clusters). In addition, some buckwheat seedlings planted for habitat enhancement for the El Segundo Blue Butterfly grew vigorously for three years and then died back (Arnold and Goins, 1987). Dr. Arnold believes that while larval use of the plants is an excellent index of the success of the habitat enhancement effort, it may be very difficult to assess that success with a five year monitoring program. He believes that a ten year program would be more appropriate.

In addition to expanding the length of the monitoring program, Dr. Arnold suggested that an attempt be made to assess larval use of the plants each year. This would entail visiting the the site through September of each year rather than ceasing monitoring when the adults stop flying in August. He suggests that the site should also be visited twice a week during the time the adults are flying. He cautions that weather conditions during the surveys could bias the data as adults will not fly in moderate to high winds or other inclement weather conditions. Butterfly use of individual plants should also be assessed and differentiated between currently existing plants and those planted during the revegetation effort.

Although Dr. Arnold's concerns regarding monitoring may be valid for a long-term study of the ecology of Smith's blue butterfly on the site, we believe that the level of effort for monitoring project-related enhancements should be compatible with the goals of the enhancement effort. The goal of the enhancements proposed in the Resource Management Plan was to provide 7.63 acres of dune scrub habitat that would support an expanding population of Smith's blue

butterfly. We believe that a five-year monitoring effort will provide an acceptible index as to whether or not this goal has been met. The Local Coastal Program also requires 5 years of monitoring. Thomas Reid has suggested, however, that monitoring be conducted for 10 years, or until initiation of the HCP (T. Reid, TRA, pers. comm.).

Monterey Sand Co. or its assignees and/or successors proposes to conduct a monitoring program as described in the bound version of the plan until the City-wide HCP is in effect. Should the City-wide HCP not become effective, Monterey Sand Co. or its assignees and/or successors will continue the monitoring program for a period not to exceed 10 years.

Monitoring the success of the Monterey ceanothus and sandmat manzanita transplants should also occur (E. Lorentzen, FWS, pers. comm.). Monitoring of the transplant efforts was implied in the bound version of the Plan (pages 26 and 30). Twenty individual ceanothus and manzanita will be permanently staked and identified during the transplant operation. These will include both transplants and nursery-grown cuttings. These individuals will be monitored throughout the monitoring program to provide an index of the relative success of the transplant and nursery cutting planting effort. Specific data to be collected throughout the monitoring program will include yearly counts of remaining transplanted Monterey ceanothus and sandmat manzanita, diameter of the individuals, observable regeneration within a five foot radius of each plant, and a general assessment of the vigor of each plant. Additional observations on the success of other transplants within the area will also be recorded. Should survival drop below 35 percent for the entire transplant area after five years, additional ceanothus and manzanita cuttings will be obtained from the remaining plants and planted in an

appropriate location identified by the City-wide HCP or another appropriate off-site location.

Long-term Maintenance: Both FWS and Sierra Club have recommended that some means be established for long-term maintenance and monitoring of the Management Areas beyond the five years proposed in the Resource Management Plan. As stated on page 43 of the bound version of the Resource Management Plan, Monterey Sand Co. will impose upon the project site recorded covenants and restrictions which will obligate the owners of the project site to manage and maintain the sensitive habitat area in accordance with this plan. These covenants and restrictions, as part of this obligation, will require the landowners to pay the amounts necessary to cover the cost of monitoring and maintenance over time.

Summary: The proposed post-implementation maintenance and monitoring plan will include the following items (and others as described in the Resource Management Plan):

1) Up to a 10-year program to monitor the success of the habitat enhancement effort.

2) Site visits once every two weeks from June 1 through September 15 each year by a qualified biologist to implement the monitoring plan.

3) Buckwheat seed will be collected from onsite in the late summer or early fall for each of the first three years. Seed will be sown in paper pots and outplanted each year during the winter rainy season for at least three years to ensure a multi-aged plant community.

4) Approximately 500 existing and first year outplanted buckwheat plants will be individually tagged with permanent stakes to allow for comparison of adult and larval use of individual plants over time. Approximately 100 seedlings will be

added to the permanent tracking system each year as they are planted during the first three years.

5) Data collected during monitoring surveys will include number of adults observed flying, number of larvae observed, location of larval sign, location of plants used, age of plants used, mortality of tagged plants, relative health of plants, and incidental observations of relative health and vigor of the plant community.

9) Trash Removal from Habitat Areas

Because it is likely that wind blown and human deposited litter may accumulate in open space areas adjacent to the shopping center, clean-up of litter and trash within Management Areas 1A, 2A, and 2B will be included in the on-going maintenance of the habitat area. Initial clean-up will occur during site grading and revegetation efforts. Litter removal from permanently protected habitat areas will be a monthly requirement in the shopping center maintenance contract. The selected maintenance personnel will be trained in an effort to minimize their disturbance to sensitive habitat features such as buckwheat plants.

10) Revision of Management Prescriptions for Monterey Bay Gilia Areas.

Mr. J. Bartell, U.S. Fish and Wildlife Service's endangered plant biologist, has expressed concern regarding management activities within the areas that currently suport Monterey Bay Gilia. The following provides a summary of his concerns (E. Lorentzen and J. Bartell, FWS, pers. comm.). Because very little is currently known about the life cycle requirements of the plant, it may be appropriate to limit management activities such as seeding, nursery stock planting, irrigation, and fertilization in the areas that currently support the gilia. Iceplant removal activities should be limited to extremely careful spraying with a low-drift

applicator after the gilia has flowered. The dead iceplant should be left in place and natural seeding or regeneration of native plants should be allowed to occur without active management.

The Resource Management Plan prescriptions for Management Area 1A are revised to incorporate these concerns. A survey will be conducted during the flowering season for Monterey gilia to identify the extent of the gilia within Management Area 1A. A 30-foot wide buffer zone around the boundary of the extent of the gilia will be staked. Iceplant will be controlled using selective low-drift spray equipment as prescribed in the bound report. No further management actions will occur within the gilia distribution zone. Ice-plant re-emergence will be monitored. If re-treatment is necessary, it will occur only following the gilia flowering season. Prescriptions for the remainder of Management Area 1A will remain the same as those described in the bound version of the report.

11) Bonus Plan for Construction Supervisor

In order to ensure that incursions into existing habitat do not occur during construction, Sierra Club representatives suggested that a bonus plan be developed for the construction supervisor. Thomas Reid (pers. comm.) suggests that a bonus plan is not necessary and he is unaware of this tact being used elsewhere. Intrusions into protected habitat areas on the project site during construction may result in legal action by FWS because of potential affects that such an intrusion may have on a listed endangered species. As long as the City of Sand City has a formal agreement with the developer, and a monitorable plan to enforce, then specific techniques used to manage the construction crew should be left up to the discretion of the landowner.

12) Miscellaneous language changes within the text of the plan

The following changes are made in the text of the bound report (emphasis is added to reflect changes or additions to text):

Page 17, Paragraph 4: The project as proposed would result in the direct loss of four individual buckwheat plants found in isolation from the remainder of the main population. These plants are located in Management Area 4A, approximately 250 to 300 feet from the nearest other existing buckwheat. ~~Several surveys of the site have recorded no Smith's blue butterflies using these particular plants (LSA 1988; TRA 1987).~~ Although Smith's blue butterfly is known to use Eriogonum on other portions of the site, the isolation of these particular plants ~~and the lack of data substantiating butterfly use of these individuals~~ suggests that these plants ~~do~~ may not serve as habitat for the Smith's blue butterfly. While, in a general sense, the loss of these individual plants may be considered as a loss of potential butterfly habitat, it is unlikely that the loss of these four isolated individual buckwheat plants would result in any affects on the resident butterfly population. Thomas Reid also indicates that the loss of these four individual buckwheats should not be considered as significantly adverse to the resident population of Smith's blue butterfly (Appendix A; T. Reid, V. Harris, TRA, pers comm.).

Page 19, Paragraph 2: THE PRIMARY GOAL OF THIS RESOURCE MANAGEMENT PLAN IS TO PROVIDE ~~8.3~~ 7.6 ACRES OF AN ENHANCED, UNIFIED, AND PERMANENTLY MAINTAINED AND PROTECTED BLOCK OF CENTRAL DUNE SCRUB HABITAT ON THE PROJECT SITE THAT WILL SUPPORT MICROCLIMATES SUITABLE FOR EXPANSION OF THE RESIDENT POPULATION OF SMITH'S BLUE BUTTERFLY, WHILE ALLOWING COMMERCIAL DEVELOPMENT ON A PORTION OF THE REMAINDER OF THE SITE.

Page 30, Paragraph 3: Monterey Sand Company or its assignees and/or successors will also provide funding for a qualified individual to monitor implementation of the improvements and habitat enhancements. This individual could be a privately hired biologist, a local citizen familiar with the project, or a local CDFG warden. (Funding in the case of using a warden would be directed through the State of California.) It is anticipated that this individual would visit the site daily during the initial grading and retaining wall installation, and approximately ~~once~~ **twice** a month during construction of the project and during implementation of the mitigation measures. Problems arising from implementation of mitigation efforts could be dealt with effectively and efficiently. Brief progress reports would be prepared and forwarded to responsible or interested agencies such as the Sand City Planning Department, CDFG and FWS.

Page 32, Paragraph 1: Surveys to assess Smith's blue butterfly use of revegetated and enhanced habitat areas will be conducted each year for the first five years of the project. Because both species of buckwheat are to be used for habitat enhancement, and because the butterfly uses the two species at different times of the year, surveys will be conducted once every two weeks from ~~mid-May through mid-August~~ **the first of June through mid-September**. Data to be collected will include number of adults observed flying, location of butterfly use, plant species of use (if known), date, time, and weather conditions. Since a goal of this mitigation project is to increase the habitat use and perhaps population numbers of Smith's blue butterfly on the site, these surveys will document observable changes in these parameters.

Page 44, Paragraph 1: ... In the event that the HCP establishes a differen mechanism, Monterey Sand Co. **or its assignees and/or successors** will participate in

that funding mechanism as a substitute for the mechanism established under this plan to the extent of the financial obligations set forth in this plan.

Page 44, Paragraph 3: As a condition to issuance of any building permits by Sand City for commencement of construction of the project, Monterey Sand Co. and all owners of the project site will enter into a formal agreement with Sand City, and applicable regulatory agencies **to the extent required by law,** to ensure that the provisions of this plan are carried out.

Page 45, Paragraph 3: Amendments to this plan shall be in writing, may be proposed by any party, and shall become effective upon written approval by Sand City and Monterey Sand Co. or its assignees and/or successors. **Ammendments will be written so as to ensure that the goals and objectives of this plan are not compromised. Amendments will be reviewed by state and/or federal regulatory agencies if the City of Sand City deems it appropriate.**

CONCLUSIONS

The preceding items are incorporated by reference into the Biological Resource Management Plan. These revisions have also resulted in slight increases in costs associated with implementation of the plan. These increases are primarily associated with increased monitoring responsibilities and are shown in the attached (revised) Table 2.

Table 2. Estimated Costs for Implementation of the Biological Mitigation Plan for the Proposed Sand City Regional Shopping Center

IMPLEMENTATION COSTS		
Initial Costs		
Seed Collection		$25,000
Plant Propogation		20,000
Fencing (temporary)	$2 per foot	6,000
Fencing (permanent)	$3 per foot	7,500
	TOTAL:	$58,500
Management Area 1A (3.53 acres)		
Iceplant Removal	$500 per acre	$1,765
Mulch/Seed/Plant	$1500 per acre	5,295
Fertilizer	$200 per acre	706
	TOTAL:	$7,766
Management Area 2A (3.24 acres)		
Iceplant Removal	$250 per acre	$ 810
Mulch/Seed/Plant	$3,000 per acre	9,720
Fertilizer	$200 per acre	648
	TOTAL:	$11,178
Management Area 2B (1.60 acres)		
Slope Contour	$1,600 per acre	$2,560
Mulch/Seed/Plant	$3,000 per acre	4,800
Fertilizer	$200 per acre	320
	TOTAL:	$7,680
Management Areas 3A & 4A		
Transplant		$5,000
Black Legless Lizard Survey		4,000
	TOTAL:	$9,000
TOTAL IMPLEMENTATION COSTS:		$94,124
10% Contingency for revegation and further iceplant removal:		$ 9,412
	TOTAL:	$103,536

Estimated cost of $0.425 per square foot of commercial development

Table 2. Estimated Costs for Implementation of the Biological Mitigation Plan for the Proposed Sand City Regional Shopping Center (continued)

MONITORING COSTS		
Year 0-3		
Initial Construction of Wall	30 days @ $700/day	$21,000
Transect Set-Up	2 days @ $700/day	1,400
Ongoing Construction Monitoring:		
Year 1	50 days @ $700/day	35,000
Year 2-3	16 days @ $700/day	11,200
Ground Photos	4 yrs @ $100/yr	400
	TOTAL	$69,000
Year 4-5		
Ongoing Monitoring	16 days @ $1,000/day	$16,000
Ground Photos	2 yrs @ $100/yr	200
Aerial Photos	1 set @ $1,500/set	1,500
	TOTAL	$17,700
Year 6-10		
Ongoing Monitoring	40 days @ $1,000/day	$40,000

APPENDIX B

SAND CITY

DUNE RESTORATION PLAN

Sand City
Dune Restoration Techniques

Prepared by:

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David Kaplow

August 9, 1989

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Acknowledgements

The restoration techniques were described to me by Tom Moss (Asilomar), Andrea Pickart (King Salmon), David Dixon (Marina Dunes), and Frank Spear (Sunset Beach). I thank them for taking the time to tell me of their work. I also wish to acknowledge the work of Jean Ferreira (Sunset Beach), Gail Newton (King Salmon), and the many other people who have taken part in these projects.

Restoration Techniques

This report prescribes the restoration techniques for the coastal communities at Sand City. The techniques are largely derived from restoration projects that have already taken place at Asilomar, Marina Dunes (Marina), Sunset Beach (Watsonville), and King Salmon.

All of the projects described in this report have successfully established a good cover of native dune plants, but none have created a truly natural plant community. The researchers have all emphasized that our knowledge of dune restoration is very inadequate. Nonetheless, results are becoming more predictable, many of the potential problems can be avoided, and the chances of success are good.

In sum: 1. both seed and container stock work well, 2. weed problems are relatively minor, 3. hydromulch is the erosion control method of choice for large areas, 4. irrigation is required to assure successful plant establishment, and 5. the major hurdle is achieving a proper species mix.

Hydromulch with Seed

Demonstration Sites Asilomar (Pacific Grove), Sunset Beach (Watsonville), King Salmon

Site Preparation : At Asilomar and Sunset Beach, most of the ice plant were sprayed with Roundup®. It was only removed in those areas where it was mixed with the natives. Both projects used 1 1/2% Roundup® with surfactant. King Salmon was performed on a newly dredged sand spit.

Seeding Technique At Asilomar and Sunset Beach all seed was introduced via the hydromulch. Seed was used in the bare areas, with container stock in the dead ice plant. At Asilomar, the seeding+mulching was applied in January, 1988.

At King Salmon, seed was introduced: 1. in the hydromulch, 2. raked into the sand prior to hydromulch, 3. raked into the sand without hydromulch, 4. harrowed into the sand without hydromulch. Asilomar had also experimented with these methods (except harrowing) prior to the main seeding project in 1988.

Species:

Nurse crop (only at Asilomar): Blando Brome (*Bromus mollis* (7 oz./ac)) and Zorrofescue (*Vulpia megalura* (5 oz/ac)). The rate of seeding is kept very low to keep the grass from overpowering the natives. The grass disappears within one or two years. The Zorrofescue is more persistent than the Blando Brome. Tom Moss suggests deleting the Zorrofescue from the nurse crop, and using 10 oz/ac of Blando Brome instead.

Most successful from seed at Asilomar:

Artemisia pycnocephala
Camissonia cheiranthifolia
Ambrosia chamissonis
Eschscholzia californica
Erysimum menziesii
Castilleja latifolia
Achillea borealis
Eriophyllum staechadifolium

Unsuccessful (or poor establishment) from seed:

Corethrogyne leucophylla
Abronia umbellata
Abronia latifolia

(See Appendix 1 for full seeding list at Asilomar)

Erosion Control Both Asilomar and Sunset Beach used hydromulch at 2000 lb/ac. The prescribed rate for King Salmon was 1500 lb/ac, but the actual rate was 1500-2500 lb/ac.

Fertilizer : 100 lb/ac of 17-12-10 ("Sierra Blend"), used at Asilomar. This is the equivalent of 0.4 lb/1000 sq ft of Nitrogen, .26 lb/1000 sq ft of Phosphorus, and .23 lb/1000 sq ft of Potassium. Fertilizer use at Sunset Beach is not known.

During the King Salmon Phase I, they used 400 lb/ac Ammonium sulfate (21-0-0); the equivalent of 1.93 lb/1000 sq ft of Nitrogen. During Phase II, they used 225-833 lb/ac of Osmocote (13-13-13); the equivalent of .67 lb/1000 sq ft each of N, P, and K. The harrowed treatment was treated with 25 lb/ac; the equivalent of .07 lb/1000 sq ft each of N, P, & K.

Irrigation: Asilomar: Rainbird irrigation heads @ 63 ft spacing. Mainlines were 2" PVC (Sched 40). Irrigation covered the entire area, but no head-to-head coverage. Irrigation was applied 4-5 times/day during initial establishment period. It was lowered to once

every 2 wks through the end of May, then discontinued.

Sunset Beach: Rainbird irrigation used on windward sides of the dunes only. Was used for the hydromulch project, but not for a subsequent container project. Reasons were to leach salt and to maintain moisture in windy locations. Goal was to ensure 'rainfall' was up to average winter amounts. Good results.

King Salmon: Rainbird irrigation using 35 ft radius heads at 57-77 ft spacing. Some heads were later changed to 50 ft radius. This provided only 75% total coverage.

Management Asilomar: Hand removal of ice plant and ripgut brome (*Bromus diandrus*) seedlings. Roundup® was also used at 1.5% with surfactant. No management at King Salmon. Sunset Beach: Unknown.

Straw Plugs with Seed and Container Stock

Demonstration Site: Marina Dunes State Beach

Site Preparation : The ice plant is removed by hand and piled to dry.

Seeding Technique Seed is hand broadcast. It is not raked in. Seeding rate is approximately 40 lb/ac.

Species: Seed list unknown. It was stated by David Dixon to represent a wide spectrum of local natives. We saw successful establishment of *Artemisia pycnocephala*, but do not know if it was from seed or container stock.

Erosion Control Handfuls of weed-free straw are "planted" in the dunes. They are placed with the straw facing vertically. Rice straw is preferred, because wheat straw produces wheat seedlings, interfering with restoration. Wheat straw is still often used, because rice straw is hard to get.
The plugs of straw are placed at about 8 in. - 1 ft. on center.

Fertilizer : The Park initially used a high level of fertilizer during its first seeding project. This created very dense growth, which led to poor results. Revegetation projects are now done without fertilizer.

Irrigation: There is no irrigation. The seeding takes place after the first significant rains of winter. In a similar situation to fertilizer, the Park used too much irrigation the first year, leading to lush vegetation, which then failed.

Management: Not known.

Container Stock

Demonstration Sites: Asilomar (Pacific Grove), Marina Dunes (Marina), Sunset Beach (Watsonville), King Salmon.

Site Preparation : At Marina Dunes, the ice plant was removed by hand and allow to dry. Ice plant at Asilomar and Sunset Beach was sprayed with 1 1/2% Roundup® with surfactant.

Species: In all cases, a wide variety of shrubs and groundcovers were planted. They represented as great a diversity of local dune species as possible.

Container Stock: Most stock is introduced in leach tubes and 2" containers, but some at Sunset Beach were as large as 5 gal. At Asilomar and Sunset Beach, most container stock was used in: 1. Dead ice plant, 2. Bare patches and small blowouts that were not feasible to hydromulch, 3. Priority areas, such as along paths. Many thousands of plants were installed at all of the projects. Asilomar reports 160,000 - 180,000 plants to date.

King Salmon used field cuttings as well as cuttings with roots attached.

Erosion Control Asilomar and Sunset Beach used dead ice plant that had time to dry out. Marina Dunes uses punched straw.

Fertilizer : Asilomar: 100 lb/ac of 17-12-10 ("Sierra Blend"). This is the equivalent of 0.4 lb/1000 sq ft of Nitrogen, .26 lb/1000 sq ft of Phosphorus, and .23 lb/1000 sq ft of Potassium. Fertilization during initial planting season only. Marina Dunes: No fertilizer. Sunset Beach: Not known. King Salmon Phase I: 400 lb/ac Ammonium sulfate (21-0-0); the equivalent of 1.93 lb/1000 sq ft of Nitrogen.

Irrigation: Asilomar: Rainbird irrigation heads @ 63 ft spacing. Mainlines were 2" PVC (Sched 40). Irrigation covered the entire area, but no head-to-head coverage. Irrigation was applied 4-5 times/day during initial establishment period. It was lowered to once every 2 wks through the end of May, then discontinued.

Marina Dunes: Rainbird irrigation used the first project year, but has not been used subsequently.

Sunset Beach: Rainbird irrigation used on windward sides of the dunes only. Was used for the hydromulch project, but not for a subsequent container project. Reasons were to leach salt and to maintain moisture in windy locations. Goal was to ensure 'rainfall' was up to average winter amounts. Good results. On the container project, begun January, 1988, they did not receive good rainfall, so needed to hand water the plants. They used 2 lb coffee cans, cut at the top and bottom, as portable collars, to ensure the water went to the roots of the plant, and did not run off.

King Salmon: Rainbird irrigation using 35 ft radius heads at 57-77 ft spacing. Some heads were later changed to 50 ft radius. The system provided only 75% total coverage.

Management: Asilomar: Hand removal of ice plant and ripgut brome (*Bromus diandrus*) seedlings. Roundup® was also used at 1.5% with surfactant. Management at other locations not known.

Discussion of Restoration Techniques

Choice of Restoration System: The Asilomar restoration project was the result of three years of experiments. This included such elements as: Seeding with and without a nurse crop, Seeding before hydromulch, Seeding with hydromulch, Irrigating (or not), Container planting, etc. They decided to restore 12 ac of relatively open dunes in one large effort, centered on seed+hydromulch. This allowed them to restore almost half of their 30 acres at once, and to show that a project of this scale could be successful. The remainder of their dunes had enough native cover that it could be done by "repair work" - ie, removing or spraying the ice plant, and planting into all the open areas.

The Marina Dunes staff had a large restoration budget during their first year. They experimented with various mulches, as well as fertilizer and irrigation. After the initial restorations, however, their money became very limited. They are now in the position of restoring a very large area with a very limited budget. Their response has been to use a technique emphasizing free hand labor, inexpensive materials (rice straw), seed, and container stock. They have discontinued the use of fertilizers and irrigation. Their method seems agonizingly slow, but it is a legitimate response to the restoration of large acreage with limited funds.

The King Salmon project was experimental in nature. It tested a wide range of techniques both for effectiveness and cost.

On the whole, I recommend stabilizing the site using Hydromulch+Seed, with some modifications (see below). I favor it for the following reasons: 1. It treats larger areas easier than the Straw Plug method, 2. It is less dependent on a large labor force, and 3. There is more control over the site.

I recommend container planting in: 1. gaps where initial seeding was unsuccessful, 2. dead ice plant, 3. bare patches and small blowouts that were not feasible to hydromulch, 4. priority areas, such as along paths.

All the projects used a great deal of container planting. Container stock gives nearly guaranteed success in areas where they are needed. Andrea Pickart, at King Salmon, said that she would rely on container planting in future projects because it gives better control. She has done a number of seeding projects, but the resulting species diversity was generally too low, with *Artemisia pycnocephala* dominating the landscape. Container planting would ensure a diverse community.

On the other hand, container stock is an expensive, slow method. A typical project can use 15,000 - 20,000 plants/acre. When working on larger acreage, it is generally better to do the initial restoration using seed. Container stock can be used later to increase the species diversity.

Location: Sand City's location may have a strong effect on the potential vegetation. For example, many plants that occur at Sand City do not occur at Asilomar. These plants include *Lupinus chamissonis* and *Eriogonum latifolium*. This may be due to microclimate or to the type of sand. Sand at Sand City and Marina Dunes has more clay and silt than Asilomar.

Ideally, one should be able to prescribe proper species mix for Sand City based on

remnant communities, but the present dune system is so disturbed that this may not be possible. The species presently found at Sand City should clearly be included. Other species, particularly those found at Fort Ord and Marina Dunes should be added.

Labor: Marina Dunes, Asilomar, and Sunset Beach used methods that rely heavily on hand labor. They were able to do this because they used free labor, such as people paying off parking tickets. Sunset Beach used prisoners from Soledad, and also used container stock produced by the prison plant nursery. This free labor is a significant budget savings, particularly during site preparation, container planting, and hand watering. Our previous experience has been that government projects have access to this labor pool, but private projects do not. Because of this, we emphasize methods that gain significant results with a smaller, but more skilled labor force.

Site Preparation : The Marina Dunes project removes the ice plant, which appears to be the only significant weed competing with a restoration. The ice plant was removed while still alive. It is very heavy and bulky at this point, so removal requires a great deal of physical labor.

The staffs at Asilomar and Sunset Beach sprayed the ice plant with Roundup® and left it in place. Ice plant was removed where it intermixed with salvagable native plants. They direct seeded (with hydromulch) onto the open sand, and used container stock in the dead ice plant. In thick ice plant, it may be necessary to wait as long as three years before it has broken down sufficiently to allow easy container planting. The dead and dried ice plant may be used for mulch in other planting projects.

At the UC Bodega Research Station, Peter Connors kills the ice plant in place, and then seed native plants into it. When ice plant is killed one summer, native seedlings can be seen growing in it the next. However, dense ice plant decomposes slowly along Monterey Bay. Some ice plant in Asilomar that has been dead for two to three years is still too dense for seedling invasion.

Those who have used Roundup® say that a an ionic surfactant is important to ensure the herbicide's effectiveness. Use a red dye in the Roundup® to mark where you have worked.

Seeding Technique The seed in a hydromulch project is broadcast with the mulch, allowing for even seed distribution. However, seed becomes suspended in the hydromulch. Due to this, as much as 50% of the seed will not become established. This problem will affect certain species more than others. Tom Moss reports that *Abronia* has poor establishment from seed in his hydromulch. He feels that *Abronia* will do better if it is buried about 1" deep in the sand.

It is likely that the species which failed in the hydromulch may have survived, had they been buried in the sand, rather than suspended in the mulch. On the other hand, some species may have thrived because they were in the hydromulch, and would have died if they had been buried in the sand.

We suggest a two step process. The larger seed is first broadcast and lightly raked. The hydromulch + small seed + nurse crop is applied next, serving as a blanket over the other seed.

The Marina Dunes staff broadcasts the seed by hand onto the sand with the punched straw, and do not rake it in. This could work well, as seed is buried by the shifting sand. David Dixon mentioned that establishment was better next to the plugs of straw.

If seed is to be applied after the straw is placed, then raking is impractical. This system will work for seed that does not require deep burial. It would be a worthwhile experiment to broadcast species requiring deep burial, such as *Abronia*, before the straw is plugged in. There may be some loss of seed that may be buried too deep, but would be greatly offset by overall improved establishment.

Container Stock: All projects used container stock in small sizes, generally in leach tubes. This container size works well for most species. Some species, such as *Arctostaphylos pumila* or *Ceanothus rigidus* grow slowly. These species should be introduced in larger sizes, such as gallon.

Leach tube and 2" stock are not very successful in grassland because these sites have more aggressive weed growth. These small plants cannot compete without mulching, hand weeding, etc. We recommend 4" containers for plants used in grassland areas, such as along the railroad tracks.

Container stock are a useful way to introduce mycorrhizae to the soil. Sand dune plants are particularly in need of mycorrhizal associations because the nutrient levels in sand are so low. Mycorrhizae are often absent from highly disturbed environments, so it is worthwhile to reintroduce them. Container stock should be inoculated at the nursery. One good way to inoculate them is to combine the potting mix with sand from the root of plants in an established, stable dune system.

Species: The projects all used a wide variety of local native species. They apparently used everything they could get locally in sufficient quantity. The exception was the King Salmon project, which concentrated on nine of the most significant native species. Appendix 1 shows the extensive seed list for Asilomar. When you visit Asilomar, you basically see *Artemisia pycnocephala*, along with *Camissonia cheiranthifolia*, *Ambrosia chamissonis*, *Haplopappus ericoides*, *Eschscholzia californica*, and scattered individuals of other species. At Marina Dunes, you will also see a lot of *Abronia spp.*, *Artemisia pycnocephala*, and some *Erysimum*. The *Abronia* is apparently a remnant of the original flora, and the other species are mostly the result of the restoration effort.

Artemisia pycnocephala is prone to dominate the initial landscape. It is important that *Artemisia* be held to as low a level as possible. At King Salmon, the *Artemisia* was so dominant that it prevented most other species from establishing themselves. At Asilomar, they used 1 lb/acre. It dominated the initial landscape, but it is slowly declining, leaving room for enhancement. We recommend a level of about 1/2 lb/acre, or even less.

Species enrichment should be an integral part of the long term management. This will provide better habitat for the wildlife, make the total vegetation more resilient to varying environmental conditions, and allow for the change of vegetation through succession. Species enrichment may be coupled with removal of some *Artemisia* if it

becomes too dominant.

As stated on page 3, the most successful species from seed at Asilomar were: *Artemisia pycnocephala, Camissonia cheiranthifolia, Ambrosia chamissonis, Eschscholzia californica, Erysimum menziesii, Castilleja latifolia, Achillea borealis,* and *Eriophyllum staechadifolium.* The *Achillea* and *Eriophyllum* germinated well in most areas, but only persisted where there was sufficient moisture. The least successful species from seed were: *Corethrogyne leucophylla, Abronia umbellata,* and *Abronia latifolia.* The *Abronia* may have done poorly due to the seeding technique, but the *Corethrogyne* may have done poorly due to low seed viability. Tom Moss reported that the seed that did poorly in the field also did poorly in germination flats. Seed gathered the next year did well in field trials as well as in the nursery.

Erosion Control I do not know which method provides better erosion control. Hydromulch does not last as long as the straw plugs, but it only needs to be effective for a few months, by which time the new seedlings have become established. The application rate of 2000 lb/ac was sufficient at Asilomar. This can work in the dunes at Sand City inland of the freeway. The seaward dunes should be mulched at an application rate of 2500-3000 lb/ac.

Hydromulch equipment may have access problems to some areas of Sand City. This can be overcome by hose lays with booster pumps. Hydromulch generally costs about $750/ac, or $890/ac if a hose lay under 100 ft is required. At Asilomar, they spent $1300/ac, including 800 ft. of hose. Tom Moss felt that this was more expensive than other hydromulch companies, but was justified by the quality of their service.

David Dixon stated that crews of eight can plant 5000 sq ft of straw plugs in 4 hours. This translates to 4 1/2 full days for a crew of eight to treat one acre, or 288 work hours per acre ($7200/acre if labor is billed at $25/hr). Kirk Ford of Harding Lawson predicts that it will take 32 hours to treat one acre, with plugs at 1'-2' centers ($800/ac @ $25/hr). I find his prediction very optimistic. I think Mr. Dixon's estimate is more reasonable, but I cannot say for sure.

Fertilizer : Fertilizer can be very helpful to a restoration, but only if the soil is nutrient deficient to begin with, and if fertilizer is used at a low level. The most sensitive nutrient to use is nitrogen. It aids in the quick establishment of new vegetation, but if the level is too high, it will cause abundant weed growth, which will kill the desirable natives. The level of Nitrogen should be from 0.5 - 1.0 lb/1000 sq ft.

Tom Moss came to the same conclusion, and applies Nitrogen at .4 lb/1000 sq ft. The plants grew well, and show no apparent nutrient deficiency. Andrea Pickart had prescribed 1.5 to 2.0 lb/1000 sq ft of Nitrogen, although actual application rates varied from 0.07 - 2.4. She found that there was poor establishment at the lowest application rates. Her reports give no problems from high application rates, as at Marina Dunes, but she states that she now favors a moderately low rate.

Irrigation: Our experience shows that irrigation is vital to ensure the success of a restoration project. It is clearly possible to have a successful project without irrigation, but dependence on the rains creates a great deal of uncertainty. This is a particular problem for contractors, who are required to guarantee their work.

Tom Moss, at Asilomar, has set up test plots for the past five years. These plots are hand seeded and mulched. In every year, except 1988-89, the results were very poor. He attributes the success of the past winter to the rains which came regularly, every two weeks. The weather was also warm and humid. This created a good growing climate in which the seedlings did not dry out.

When starting new grasslands, we prefer four starts per day for the first two weeks. This ensures constant surface moisture to guarantee good germination. Sand is a particularly droughty environment for the establishment of new seedlings. The surface dries out quickly, and irrigation becomes that much more important. As the seedlings become established, irrigation becomes less frequent. It can be stopped by late spring. It is advisable to resume irrigation, where possible, by the following September. A similar strategy was used at Asilomar, where they used four starts per day to start germination. They ended irrigation in May, but did not resume in the fall. They report good results. Their experience showed them that irrigation is unnecessary if the rains cooperate, but is indispensable when the rains fail.

An important advantage of irrigation is that it allows an earlier start to germination. When a project depends on winter rain, germination may not start until mid to late November. Growth of plants usually stops from mid December to early February, which means that these plants must face the winter while still very small. By contrast, a plant that starts growing by September or October has a few months to grow while the air and soil are warm. These plants can face winter in a larger and more robust condition.

At Asilomar, they used a semipermanent system with standard PVC. This is a good system, but it will break down in a few years. White PVC becomes brittle after long exposure to the sun. It may not break if left in place, but it will be very prone to breakage if it is moved or struck. The system can be made movable if brownline PVC is used instead. Brownline PVC is more expensive. In fact, it costs as much as steel pipe, but it is light and it is UV resistant, which means it can be moved.

The project could rent a portable agricultural system, with aluminum pipe and rainbirds. We once used a temporary aluminum irrigation system on six acres, costing a total of $2600, including 2 waterings. It also cost $650/additional watering, and $850 for the rental of a booster pump for 2 weeks. This averages to a $433/ac base price, with $108/ac for each additional watering.

Another alternative is the use of old fire hose. Fire hoses have large diameters, so can conduct water for long distances without a significant pressure drop from friction. An extensive, portable system may be constructed with little cost for hose. Two problems may present themselves. The first is that the hose is easily cut, and thus may be vandalized. Thus, the hose should only be used where few people are likely to discover it. The second problem is the potential cost of adaptors from the fire hose to the irrigation heads.

Management Each project is relatively new. There has been no long-term management as such. They have engaged in weed control, notably for ice plant. There is also control of ripgut brome at Asilomar. This involves hand removal or spraying with Roundup®.

The restoration projects that have been analyzed should be considered as the first stage in an ongoing process. The major weeds have been controlled and pioneer plants have been established, but the long-term management is only beginning. Long-term management needs to include Weed Control and Species Enrichment.

Weed Control – Dunes are not particularly weed prone. They will face significant infestations from ice plant, but this is the only weed that poses a major management problem at Sand City. Ice plant is most problematic for the first few years of the project, but will quickly decline in importance, if they are prevented from reproducing, and any seedlings are vigilantly killed. Other species, such as Ripgut Brome (*Bromus diandrus*) will not threaten to dominate the dunes, but will be harder to completely exterminate. The projects discussed have engaged in weed control; mostly removing small weed seedlings and spraying large outbreaks. They are all relatively new projects, and have not yet reached the point where the weeds have been controlled.

Weeds may become a significant problem along the railroad tracks. Much of the area is like the surrounding dunes, but large areas can support a richer flora, attested to by the presence of poison oak and large stands of annual grasses. This site should be treated more like a grassland than a dune. The problem may even increase as the new shopping center is built, reducing the wind and introducing water from irrigated landscapes. Here, a long-term program of mowing will need to be instituted.

Species Enrichment – The projects are relatively new, and seem dominated by *Artemisia pycnocephala*, along with *Camissonia cheiranthifolia, Haplopappus ericoides, Ambrosia chamissonis, Eschscholzia californica* and, occasionally, *Abronia spp.* These species are important and beneficial, but may represent an early successional stage, and not the long-term plant community. Management should include regular introductions of new species. These introductions can take place be seeding or by container stock.

If the initial restoration is successful, the ground will be covered by seedlings at a fairly even spacing, making it impractical to introduce plants via seed. Container stock may be the only way to introduce new species over much of the sites. Small container sizes (2" and leach tubes) are the cheapest to install, but they are the most vulnerable to competition from more established plants. Consider the use of 4" container stock. It is a little more expensive, but is more competitive, due to its larger size.

Seed should be explored as a species enhancement alternative, because it is relatively inexpensive. It would be better to choose areas where the existing plants are at low density. The new seedlings will need at least one year, and possibly two years, to compete successfully with the existing plants. Areas to seed may include: Sites where the original plants did not become established, Blow outs, Sites where the original plants do not seem to thrive, and Sites where the new species are better adapted.

Schedule for Initial Dune Revegetation

May	Start Seed and Cutting Collection
May	Start Growing Container Stock
August	Spray Ice Plant
September	Set Up Irrigation
September-October	Broadcast and Rake Seed
September-October	Plant Container Stock
September-October	Hydromulch + Nurse Crop
September-October	Start Irrigation
February-March	Begin Weed Control
Late May	End Irrigation

Schedule for Yearly Dune Management

October	Broadcast and Rake Seed in Bare Areas
October	Hydromulch in Large Blowouts
November	Plant Container Stock
February-May	Weed Control

Schedule for Initial Grassland Revegetation

May	Start Seed and Cutting Collection
May	Start Growing Container Stock
August	Spray Ice Plant
August-September	Mow Grass with Flail Mower
September	Set Up Irrigation
September-October	Broadcast and Rake Seed
September-October	Plant Container Stock
September-October	Start Irrigation
February	Mow with Sickle Bar Mower
March-May	Mow as Needed with Sickle Bar Mower
Late May	End Irrigation
June	Mow with Flail Mower

Schedule for Yearly Grassland Management

October	Broadcast and Rake Seed in Bare Areas
November	Plant Container Stock
February-April	Mow As Needed with Sickle Bar Mower
June	Mow with Flail Mower

Cost Information

Seed	Materials	Labor	Price/sq ft
	$1500/ac	$600/ac	0.05/sq ft

Container Stock	Materials	Labor	@ 2 ft Spacing
2" or Leach Tube:	0.60-0.90 ea	50 plnts/hr=0.50 ea	0.35/sq ft
4"	1.80 ea	25 plnts/hr=1.00 ea	0.70/sq ft
Gal	2.50 ea	15 plnts/hr=1.67 ea	1.04/sq ft

Site Preparation	Materials	Labor	Price/sq ft
Roundup® Herbicide	$50/ac	$300/ac	0.01/sq ft
Physical Ice Plant Removal		16 days/ac = 3200	0.07/sq ft

Erosion Control	Materials	Labor	Price/sq ft
Hydromulch	700-2000/ac		.02-.05/sq ft
Punched Straw	140/ac	800-7200/ac	.02-.17/sq ft

Irrigation			
Brownline PVC			
Rented Agricultural			
Base Price		433/ac	.01/sq ft
Additional Watering		108/ac	.0025/sq ft
Fire Hose			

Fertilization	Materials	Labor	Price/sq ft
	91/ac	350/ac	.01/sq ft

Mowing	Rental	Labor	Price/sq ft
Weed Eater	65/ac	350/ac	.01
Flail	60/ac	40/ac	.0023/sq ft
Sickle Bar	60/ac	67/ac	.003/sq ft

Restoration Prescriptions

The following sections give prescriptions for restoration in the various site conditions at Sand City. The following conditions have been identified: 1. Stable dunes with native annuals and decadent ice plant, 2. Unstable seaside dunes with little or no cover, 3. Stable dunes dominated by vigorous ice plant, 4. Pre-Flandrian coastal terrace, and 5. Railroad right-of-way.

The entire project area need not be converted in one year. If necessary, the initial type conversions can be spread out over a three to five year period. This has the following advantages: The project will have more continuity, The irrigation system, a significant budget item, can be reused for each of the restoration projects, and The activities can be more focused for each vegetation type.

This report has concentrated on the initial restoration techniques, because we are at the beginning of the work, but the key to success will ultimately lie in the long-term maintenance. A frequent misconception is that because natives are "low-maintenance", a project can be started one season and neglected the next. This is a major cause of project failure, and it is fully avoidable. The dune community will be capable of "taking care of itself", but only after some years of follow-up maintenance. Even then, the dune community could be damaged by any of a number of causes, so that monitoring and occasional site repair will be necessary to keep the dunes in prime condition.

The initial restoration will establish a good vegetative cover, but a number of problems will take time to correct. The first problem is weed control. Ice plant and annual grass reinvasion can largely be solved within the first few years, but the site will still need to be monitored, and weed invasions will need to be stopped. The second problem is low species diversity. We can expect that a few species will be quite successful during the initial restoration, but many significant species will be underrepresented, or even absent. The introduction of these species, to create a diverse, stable plant and wildlife community, will take a number of planting seasons. The third problem will be site repair, due to poor plant establishment or to physical damage by people or the elements.

A major problem has been to find a site suitable for *Arctostaphylos pumila* and *Ceanothus rigidus*. These plants, presently found on the Pre-Flandrian Coastal Terrace, would be destroyed if the site is developed. A short stretch of the Railroad Right-Of-Way is an extension of the Pre-Flandrian Terrace, so should be able to support these plants. Most of the remainder of the Right-Of-Way seems to have a soil that would support these plants, but there is also a larger weed problem, so that the *Arctostaphylos* and *Ceanothus* would require more maintenance. Nonetheless, this seems to be only large area in Sand City that would work.

It may be possible to transplant these plants, but it seems doubtful they would survive, particularly the *Arctostaphylos*. It would probably be better to start new plants from cuttings and seed.

Stable Dunes with Native Annuals and Decadent Ice Plant

Location: The area southwest of Tioga Ave., across the street from the Costco Development.

Site Description: Low, rounded dunes. This is a significant habitat area for the Smith's Blue Butterfly, containing the largest and most vigorous population of rare *Gilia tenuiflora arenaria*in Sand City, along with *Eriogonum latifolium* and *E. parvifolium*.

This site has been heavily disturbed by vehicles, and to a less extent by foot traffic. The disturbance is said to concentrate on July 4th, when people use this area to set off fireworks and to observe the fireworks in Monterey. Most natives are suffering from the disturbance. The only plant that seems to be thriving is the *Gilia*.

Management Goal: Restore stable and diverse native plant community. Ensure continued vitality of *Gilia tenuiflora* population. Enhance other native species beneficial to Smith's Blue Butterfly, such as *Eriogonum latifolium* and *E. parvifolium*.

The management system, which will stabilize the dune community and reduce disturbance, may end up causing a decline in the *Gilia* population. There seems to be little specific knowledge on *Gilia tenuiflora* behavior, or how it will react to a change in the plant community.

Site Preparation: Spray ice plant with 1 1/2% Roundup® with ionic surfactant and red marker dye. Hand clear ice plant at least 1-2 ft from native plants prior to spraying. Spray during periods of low wind speed, such as early morning. Hold spray head as close to the ground as practical, in order to minimize drift. Complete spraying by the end of August, so that the ice plant will be dead by the end of September.

This site is particularly prone to disturbance by vehicles. A system of fences or ballards should be erected to stop any unwanted vehicles from the site.

Seeding Technique: Spread seed by hand in areas of open sand, then rake. Spread nurse crop of Zorrofescue (5 oz/ac) and Blando Brome (7 oz/ac) in the hydromulch. Seeding and mulching should be performed before October 31.

Container Stock: Plant container stock in areas of dead ice plant. Do planting, if possible, before application of hydromulch. Use 2", 4" and leach tube container stock. Introduce those species that are not successfully introduced from seed, species of high priority, and those species without sufficient seed for broadcasting.

Introduce plants in either October or March if irrigation is available. Planting from November through February is also possible, but not as desirable.

Species: Use all species presently found on the site, as well as any others in a Mid-Dune community. *Eriogonum latifolium* and *Eriogonum parvifolium*, important foraging plants for Smith's Blue Butterflies, should be emphasized.

Fertilizer: 100 lb/ac of 17-12-10 ("Sierra Blend") mixed in with the hydromulch.

Erosion Control Hydromulch in areas of open sand at 2000 lb/ac.

Irrigation: Overhead irrigation; either rainbird or gear rotor. Use brownline PVC, rented agricultural system, or fire hose. Irrigation should be set up before seeding, container planting and hydromulching.

Water with 4 starts/day for the first three weeks. Thereafter, area should receive either irrigation or natural rain every 1-2 weeks through March. During April and May, site should receive water every 2-3 weeks. Discontinue after May. Disassemble system.

Management The first year will concentrate of new plant establishment and weed control. During the next growing season, large bare spots will need to be filled in. This will be the first opportunity to introduce new species.

Unstable Seaside Dunes, with Little or No Cover

Location: The dune system on the seaward side of the freeway.

Site Description: A series of tall dunes. There is virtually no native vegetation. Over half of the surface is exposed sand; the rest is ice plant.

Management Goal: Stabilize surface and prevent erosion by establishing a continuous surface cover of native vegetation.

Site Preparation: Consult with engineer to ensure the dunes are in a stable configuration. The dunes may require resculpting. If they are considered stable, spray ice plant with 1 1/2% Roundup® with ionic surfactant and red marker dye. Spraying should be completed by the end of August, so that the ice plant will be dead by the end of September.

Seeding Technique: Spread seed in areas of open sand by hand, then rake. Spread nurse crop of Zorrofescue (5 oz/ac) and Blando Brome (7 oz/ac) in the hydromulch. Seeding and mulching should be performed before October 31.

Container Stock: Plant container stock in areas of dead ice plant. Do planting, if possible, before application of hydromulch. Use 2", 4" and leach tube container stock. Introduce those species that are not successfully introduced from seed, species of high priority, and those species without sufficient seed for broadcasting.

Introduce plants in either October or March if irrigation is available. Planting from November through February is also possible, but not as desirable.

Species: Concentrate on coastal strand, foredune and mid-dune vegetation.

Erosion Control: Hydromulch in areas of open sand at 2500-3000 lb/ac

Fertilizer: 100 lb/ac of 17-12-10 ("Sierra Blend") mixed in with the hydromulch

Irrigation: Overhead irrigation; either rainbird or gear rotor. Use brownline PVC, rented agricultural system, or fire hose. Irrigation should be set up before seeding, container planting and hydromulching.

Water with 4 starts/day for the first three weeks. Thereafter, area should receive either irrigation or natural rain every 1-2 weeks through March. During April and May, site should receive water every 2-3 weeks. Discontinue after May. Disassemble system.

Management: The first year will concentrate of new plant establishment and weed control. During the next growing season, large bare spots will need to be filled in. This will be the first opportunity to introduce new species.

This site will be particularly prone to erosion, due to the high winds. The site repair during the second growing season will probably be greater for this area than for the others.

Stable Dunes dominated by Vigorous Ice Plant

Location: The area between the Pre-Flandrian plant community and the freeway.

Site Description: These are wind protected dunes that had apparently been mined for sand. The vegetation is almost solid ice plant, although there are significant numbers of *Croton* found within this community.

Management Goal: Replace existing ice plant vegetation with native plant community.

Site Preparation: Spray ice plant with 1 1/2% Roundup® with ionic surfactant and red marker dye. Hand clear ice plant at least 1-2 ft from native plants prior to spraying. Spray during periods of low wind speed, such as early morning. Hold spray head as close to the ground as practical, in order to minimize drift. Spraying should be completed by the end of August, so that the ice plant will be dead by the end of September.

Seeding Technique: There is so little open sand that seeding may not be included in the restoration system. If areas for seeding are identified, spread seed by hand, then rake. Spread nurse crop of Zorrofescue (5 oz/ac) and Blando Brome (7 oz/ac) in the hydromulch. Seeding should be performed before October 31.

Container Stock: Plant container stock in areas of dead ice plant. Do planting, if possible, before application of hydromulch. Use 2", 4" and leach tube container stock. Introduce those species that are not successfully introduced from seed, species of high priority, and those species without sufficient seed for broadcasting.

Introduce plants in either October or March if irrigation is available. Planting from November through February is also possible, but not as desirable.

Species: This site will support the normal dune vegetation. Due to the wind protection from the freeway, the site may support more of the "Backdune" plants, such as *Baccharis pilularis pilularis*.

Erosion Control: Hydromulch at 2000 lb/ac in areas of open sand.

Fertilizer: 100 lb/ac of 17-12-10 ("Sierra Blend") mixed in with the hydromulch

Irrigation: Overhead irrigation; either rainbird or gear rotor. Use brownline PVC, a rented agricultural system, or fire hose. Irrigation should be set up before seeding and hydromulching.

Management: This area will be particularly prone to ice plant reinvasion, as well as annual grasses. Weed control during the first few years will be particularly critical.

Pre-Flandrian Coastal Terrace

Location: A large tract at the southeastern, bordered by the Costco Development and the Railroad Right-Of-Way.

Site Description: This area had been mined for sand. This ended when the mining company uncovered a former coastal terrace. The newly exposed soil is suitable for some sand dune species as well as for species accustomed to more developed soil, notably *Arctostaphylos pumila* and *Ceanothus rigidus*.

This area has a stable native community. It is probably in the best shape of all the Sand City natural areas. It would benefit from the introduction of more native species, but does not seem to require them to remain healthy. The only significant problem is some outbreaks of ice plant and french broom. The ice plant does not seem very aggressive on this site, but the French Broom is actively spreading.

Management Goal: Remove competing weedy exotics, notably Ice Plant and French Broom. Allow for natural revegetation.

Site Preparation: Spray ice plant with 1 1/2% Roundup® with ionic surfactant and red marker dye. Hand clear ice plant at least 1-2 ft from native plants prior to spraying. Spray during periods of low wind speed, such as early morning. Hold spray head as close to the ground as practical, in order to minimize drift. Complete spraying by the end of August, so that the ice plant will be dead by the end of September.

Remove French Broom by pulaski or mattock.

Seeding Technique: Spread seed by hand by late October. Rake it in.

Container Stock: *Arctostaphylos pumila* and *Ceanothus rigidus* would need to planted as container stock. Container stock would be introduced as early as November, or as late as March.

Species: Seed or container stock is not absolutely required, because the site can revegetate itself. Do introductions for species enrichment. More *Ceanothus rigidus* or *Arctostaphylos pumila* may be deemed desirable. The general plant palette would be from the Coastal Terrace, Mid-Dune, and Back Dune communities.

Erosion Control: No additional erosion control is necessary.

Irrigation: Hand watering for container stock, particularly for late season introductions.

Management: Removal or ice plant and broom seedlings each late winter or early spring.

Railroad Right-Of-Way

Location: The railroad right-of-way that runs inland of the dunes.

Site Description: This is a mix of soil types and plant communities; from Mid-Dune and Back Dune to Coastal Terrace and Annual Grassland.

Management Goal: Restore a mix of native plant communities, based on the soil type and the vegetation type found within the area. This is a candidate site to move the *Arctostaphylos pumila* and *Ceanothus rigidus* if the Pre-Flandrian area is to be built upon.

Site Preparation: Spray ice plant with 1 1/2% Roundup® with ionic surfactant and red marker dye. Hand clear ice plant at least 1-2 ft from native plants prior to spraying. Spray during periods of low wind speed, such as early morning. Hold spray head as close to the ground as practical, in order to minimize drift. Complete spraying by the end of August, so that the ice plant will be dead by the end of September.

Mow annual grasses as low to the ground as possible.

Seeding Technique: Spread seed by hand in areas of open sand, then rake. Spread nurse crop of Zorrofescue (5 oz/ac) and Blando Brome (7 oz/ac) in the hydromulch. Seeding and mulching should be performed before October 31.

Container Stock: Plant container stock in areas of dead ice plant. Do planting, if possible, before application of hydromulch. Use 2", 4" and leach tube container stock. Introduce those species that are not successfully introduced from seed, species of high priority, and those species without sufficient seed for broadcasting.

Introduce plants in either October or March if irrigation is available. Planting from November through February is also possible, but not as desirable.

Species: Use species appropriate to the various soil and vegetation types. This will include the use of native prairie grasses.

Erosion Control: Hydromulch in areas of open sand at 2000 lb/ac.

Fertilizer: 100 lb/ac of 17-12-10 ("Sierra Blend") mixed in with the hydromulch

Irrigation: Overhead irrigation; either rainbird or gear rotor. Use brownline PVC, rented agricultural system, or fire hose. This area is the most visible, so the fire hose would be most susceptable to vandalism. Irrigation should be set up before seeding, container planting and hydromulching.

Water with 4 starts/day for the first three weeks. Thereafter, area should receive either irrigation or natural rain every 1-2 weeks through March. During April and May, site should receive water every 2-3 weeks. Discontinue after May. Disassemble system.

Management: The first year will concentrate of new plant establishment and weed control. During the next growing season, large bare spots will need to be filled in. This will be the first opportunity to introduce new species.

Asilomar Seed List

Dunes

	Seed / Ac
Artemisia pycnocephala	1 lb
Abronia latifolia	2 lb
Ambrosia chamissonis	2 lb
Haplopappus ericoides	2 lb
Corethrogyne leucophylla	6 oz
Eriogonum parvifolium	6 oz
Castilleja latifolia	2 oz
Eschscholzia californica	1/2 oz
Baccharis pilularis pilularis	4 oz
Abronia umbellata	6 oz
Camissonia cheiranthifolia	1 oz
Eriophyllum staechadifolium	1 oz
Erysimum capitatum	1/2 oz
Armeria maritima	1/2 oz

Swales

	Seed/Ac
Artemisia pycnocephala	8 oz
Haplopappus ericoides	2 lb
Eriophyllum staechadifolium	8 oz
Baccharis pilularis pilularis	2 lb
Achillea borealis	8 oz
Erysimum capitatum	8 oz
Abronia umbellata	8 oz
Castilleja latifolia	1 oz
Camissonia cheiranthifolia	1 oz

Methods of Introduction

Species to be Introduced by Seed

Calystegia soldanella	Beach Morning Glory
Camissonia cheiranthifolia	Beach Evening Primrose
Chorizanthe pungens	
Croton californicus	Croton
Cryptantha leiocarpa	Popcorn Flower
Eriophyllum multicaule	
Gilia tenuiflora arenaria	Dune Gilia
Lasthenia glabrata	Goldfields
Layia platyglossa	Tidy Tips
Lupinus bicolor	Annual Lupine
Orthocarpus purpurescens	Owl's Clover
Phacelia ramosissima montereye. .s	Phacelia

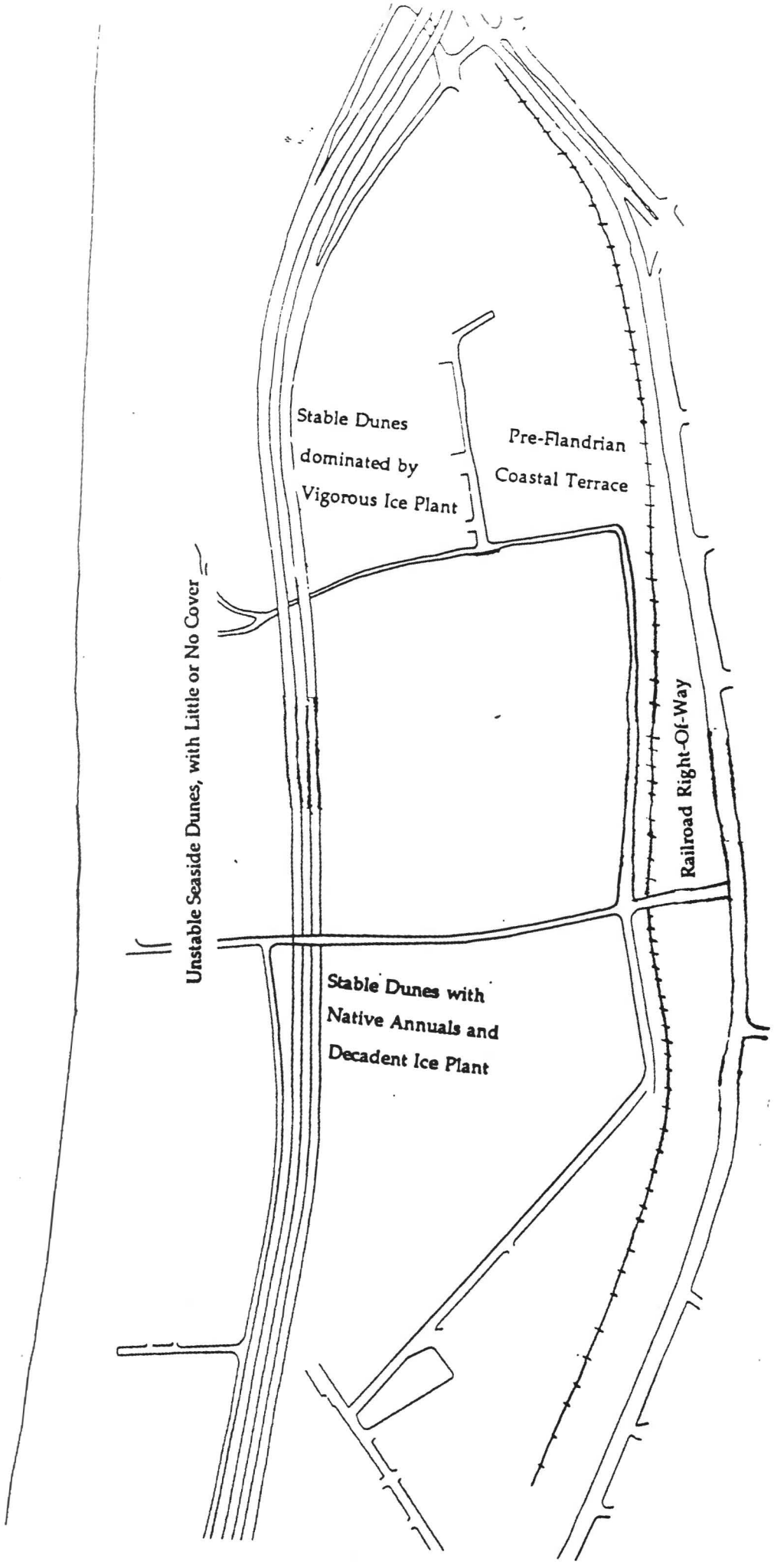
Species to be Introduced by Seed or Container Stock

Abronia latifolia	Yellow Sand Verbena
Abronia umbellata	Pink Sand Verbena
Acaena californica	
Achillea borealis arenicola	Yarrow
Armeria maritima	Thrift
Artemisia pycnocephala	Dune Sagebrush
Astragalus nuttallii	Beach Locoweed
Atriplex leucophylla	Dune Saltbush
Baccharis pilularis pilularis	Prostrate Coyote Bush
Erigeron glaucus	Seaside Daisy
Eriogonum latifolium	Buckwheat
Eriogonum parvifolium	Dune Buckwheat
Eriophyllum staechadifolium	Lizardtail
Erysimum ammophilum	Beach Wallflower
Erysimum menziesii	Menzies Wallflower
Eschscholzia californica maritima	California Poppy
Ambrosia chamissonis	Silver Beachweed
Grindelia stricta venulosa	Shore Gumplant
Haplopappus ericoides	Mock Heather
Helianthemum scoparium	Sunrose
Lathyrus littoralis	Beach Pea
Lotus scoparius	Deerweed
Lupinus arboreus	Bush Lupine
Lupinus chamissonis	Dune Lupine

Plantago maritima	Coast Plantain
Polygonum paronychia	Dune Knotweed
Rhamnus californica	California Coffeeberry

Species to be Introduced by Container Stock Only

Arctostaphylos pumila	Sandmat Manzanita
Castilleja latifolia	Indian Paintbrush
Ceanothus rigidus	Wild Lilac
Corethrogyne californica	Beach Aster
Dudleya caespitosa	Live Forever
Elymus mollis	Dune Ryegrass
Fragaria chiloensis	Beach Strawberry
Myrica californica	California Wax Myrtle
Poa douglasii	Dune Bluegrass



Restoration Sites at

Sand City, California

APPENDIX C

1992 SMITH'S BLUE BUTTERFLY

MONITORING REPORT

1992 MONITORING REPORT

FOR THE ENDANGERED

SMITH'S BLUE BUTTERFLY

AT THE SAND DOLLAR SHOPPING CENTER

IN SAND CITY, CALIFORNIA

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Report Date:
15 September 1992

INTRODUCTION

Monitoring surveys to estimate the relative abundance of the endangered Smith's Blue butterfly, *Euphilotes enoptes smithi*, were conducted for a second consecutive year at the Sand Dollar Shopping Center, located in Sand City, California, during the butterfly's 1992 flight season. The butterfly monitoring is one component of the longterm resource management program for the shopping center (Harding Lawson Associates 1989). During the butterfly's 1991 flight season, relative abundance of the butterfly was estimated using a transect count method described by Pollard et al. (1974) in the Phase I mitigation portion (Management Areas 1A, 2A, and 2B) of the shopping center project site (Entomological Consulting Services, Ltd. 1991). In 1992, monitoring surveys were repeated in the Phase I area, and expanded to include Management Areas 1B and 3B (Figure 1). The transect count method was used to estimate the butterfly's relative abundance in 1992, to permit comparison of results from both years.

All field studies described in this report were conducted between June 21st and August 12th, 1992. The project site was visited 15 times during this seven-week period. In Management Areas #1A, 2A, and 2B, which is also referred to as the Phase I mitigation site, five transects (#1 - #5 in Figure 1), which were utilized during the 1991 monitoring studies, were sampled in 1992 to estimate relative abundance of the Smith's Blue. Also, two new transects (#6 and #7 in Figure 1) were established in Managment Area 3B and one new transect (#8 in Figure 1) was established in Management Area 1B. The results of annual monitoring of the Smith's Blue allows the resource manager to detect significant changes in the population numbers of the endangered butterfly and to evaluate the success of management activities to benefit the butterfly.

METHODS

Pollard et al. (1974) described a transect count method for estimating relative abundance of butterflies. The data collection and analytical methods employed during the 1992 monitoring surveys were identical to those described in the 1991 monitoring report (Entomological Consulting Services, Ltd. 1991).

Briefly, Pollard's transect method, as it was used to estimate relative abundance of the Smith's Blue, can be described as follows. Transects were established in five management areas of the shopping center. In Management Areas #1A, 2A, and 2B, five transects, as used in 1991, were sampled in 1992. However, because the buckwheat (*Eriogonum*) foodplants growing along each transect had increased in number and flower production, the length of each transect was increased for the 1992 surveys. Two transects were establisehd in Management Area #3B and one transect was established in Management Area #1B. The locations of these transects were selected after a reconnaissance of both parcels to identify where the buckwheat foodplants (*Eriogonum parvifolium* and *E. latifolium*) of the Smith's Blue grew. The length of each transect was

measured using a ROLATAPE measuring wheel (Table 1). The starting, ending, and any intermediate points along each transect path were flagged and uniqued identified in the field.

The transect locations (Figure 1) at the Sand Dollar Shopping Center can be described as follows:

a) Transect #1 crosses Management Areas #2A, 2B, and 1A and supports resident plants of both *Erigonum parvifolium* and *E. latifolium*;

b) Transect #2 is located in Management Area #1A, and supports resident and revegetated plants of primarily *E. parvifolium*, and lesser numbers of *E. latifolium*;

c) Transect #3 is located in Management Area #1A, and supports resident and revegetated plants of primarily *E. parvifolium*, and lesser numbers of *E. latifolium*;

d) Transect #4 is located in Management Area #1A, and supports resident and revegetated plants of primarily *E. latifolium*, and lesser numbers of *E. parvifolium*;

e) Transect #5 is located in Management Area #2B, and supports resident and revegetated plants of *E. parvifolium* and *E. latifolium* growing in approximately equal numbers;

f) Transect #6 is located in the Southern Pacific railroad right-of-way, immediately east of Management Area #3B, and supports resident plants of primarily *E. latifolium* and lesser numbers of *E. parvifolium*;

g) Transect #7 is located in Management Area #3B, and supports resident plants of primarily *E. parvifolium* and lesser numbers of *E. latifolium*; and

h) Transect #8 is located in Management Area #1B, and supports resident plants of primarily *E. parvifolium* and lesser numbers of *E. latifolium*.

The length of each transect was determined by the distribution of buckwheat foodplants along each transect. Transects #1, #2, #3, and #4 were lengthened in 1992 because additional buckwheats were flowering compared to 1991. All of the transects supported a mixture of seedlings, juveniles, and mature buckwheats, although the proportion of these age classes varied among the transects.

On 15 days during the Smith's Blue 1992 flight season, between June 21st and August 12th, each transect was walked at a constant pace. As adult Smith's Blues were observed, information about their sex, behavior, plant association, observation time, wing wear, and weather conditions were recorded on a data form. No butterflies were captured or otherwise handled. Butterflies of questionable identity were also noted, but not included in the transect counts. The starting and ending time of each transect count was also recorded on the data form. Wing wear was classified into one of three categories, fresh, slightly worn, or very worn, based on the progressive deterioration of brilliant wing colors and increasing chips and tears in the wings that occur with increasing age of the butterflies.

Like all butterflies, the Smith's Blue is cold-blooded and requires the radiant energy of the sun to be active. Thus, low air temperature, cloud cover, and strong winds can adversely affect butterfly activity. For this reason, all transect counts were performed when weather conditions were favorable for butterfly activity, i.e., air temperatures > 60^{o}F, light breezes or

no winds, and sunny or partly cloudy skies. Air temperatures and wind velocities were measured with hand-held instruments, or deemed suitable because other butterflies were active.

The sequence in which transects were walked for the butterfly counts on different days was randomized to insure that each transect was sampled at various times of day throughout the adult flight season. Table 2 describes the sampling order for the eight transects. Because there were only two transects in Management Area #3B, the sampling sequence for the transects alternated on each survey date. Although there was only one transect in Management Area #1B, surveys were alternately walked in north to south, and south to north directions to prevent repeated sampling in the same place at the same time on different visits.

In addition to the transect survey time, extra time was spend in Management Area #3B and the adjacent railroad right-of-way. The purpose of spending this additional effort was to determine the status of the Smith's Blue in this portion of the shopping center site.

RESULTS AND DISCUSSION

Transect counts of Smith's Blue adults were performed on 15 days between June 21st and August 12th. The actual numbers of adults observed along each transect on each count day and for the entire study period are presented in Table 3. Throughout the flight season, a total of 803 adults were observed. The vast majority of butterfly observations, 753 of 803 total, occurred along transects #2, #3, #8, #1, and #4. Only 50 blues were observed along transect #5, while no butterflies were observed along either transects #6 and #7.

Observed behaviors, which are summarized by transect in Table 4, included nectaring (n = 67), flying (n = 451), perching or basking (n = 265), and courtship or mating (n = 20). The primary plant associations for the non-flying behaviors were the butterfly's foodplants, *Eriogonum parvifolium* and *E. latifolium*.

Weather conditions were generally favorable for butterfly activity on all days, with temperatures ranging from the mid 60's to mid 80's ^{o}F. Winds generally consisted of just light breezes. Cloud cover was generally absent, or only partly cloudy. On each day that transect counts were taken, other butterfly species were active, which suggest that the blues could be active. All surveys occurred between the hours of 0930 and 1530 PDT.

To facilitate comparison of results between the transects, an index of butterfly abundance, based on the number of butterflies observed per foot of transect length, was calculated for every transect and each day of the surveys. All index values are presented in Table 5.

Table 1. Distances, measured in feet, for each of the transects used to estimate relative abundance of the Smith's Blue butterfly in 1992 at the Sand Dollar Shopping Center management sites. For those transects, whose lengths were extended for the 1992 monitoring, the 1991 transect lengths are noted in parentheses.

Transect	Distance
Management Areas #1A, 2A, & 2B:	
#1	328 (168)
#2	176 (108)
#3	255 (187)
#4	279 (217)
#5	155
Management Area #3B:	
#6	331
#7	504
Management Area #1B:	
#8	424

Table 2. Transect sampling order for each date of the Smith's Blue butterfly monitoring study in 1992 at the Sand Dollar Shopping Center.

Date	Transect Sampling Order
6/21	1, 2, 3, 4, 5, 6, 7, 8
6/26	2, 1, 4, 3, 5, 8, 7, 6
7/1	5, 3, 2, 1, 4, 6, 7, 8
7/7	6, 8, 7, 4, 3, 2, 1, 5
7/11	1, 2, 3, 5, 4, 6, 7, 8
7/12	6, 8, 7, 4, 3, 2, 1, 5
7/15	2, 3, 4, 1, 5, 8, 6, 7
7/17	4, 3, 2, 5, 1, 8, 7, 6
7/19	1, 2, 3, 4, 5, 8, 6, 7
7/23	2, 4, 3, 1, 5, 7, 8, 6
7/28	8, 7, 6, 3, 5, 1, 4, 2
7/31	4, 1, 3, 2, 5, 7, 8, 6
8/4	6, 8, 7, 5, 3, 1, 2, 4
8/7	1, 3, 2, 4, 5, 7, 8, 6
8/12	8, 7, 6, 3, 4, 5, 1, 2

Table 3. Numbers of Smith's Blue butterflies observed along each transect on every count day, along with daily totals (sum of observations along all four transects for a particular day) and seasonal totals (sum of all daily totals).

	- - - - - - - - - - - - T R A N S E C T - - - - - - - - - -								Daily
Date	#1	#2	#3	#4	#5	#6	#7	#8	Total
6/21	8	17	11	9	8	0	0	22	75
6/26	20	28	41	28	15	0	0	34	166
7/1	26	37	29	27	18	0	0	39	176
7/7	36	29	35	32	3	0	0	8	143
7/11	6	15	8	3	0	0	0	9	41
7/12	9	10	11	3	0	0	0	13	46
7/15	8	12	8	5	0	0	0	8	41
7/17	9	9	8	2	1	0	0	2	31
7/19	2	2	1	1	1	0	0	2	9
7/23	8	10	7	8	2	0	0	10	45
7/28	5	3	2	1	1	0	0	3	15
7/31	2	2	1	1	1	0	0	2	9
8/4	2	0	0	1	0	0	0	0	3
8/7	2	0	0	1	0	0	0	0	3
8/12	0	0	0	0	0	0	0	0	0
Totals (by transect)	143	174	162	122	50	0	0	152	803 (Seasonal total)

Table 4. Numbers of Smith's Blue butterflies observed along each transect, along with a breakdown by behavior.

	TRANSECT								
Behavior	#1	#2	#3	#4	#5	#6	#7	#8	Behavior Totals
Nectaring	16	15	8	13	7	0	0	8	67
Perch/Bask	35	68	47	33	18	0	0	64	265
Flying	82	87	105	74	23	0	0	78	451
Court/Mate	8	4	2	2	2	0	0	2	20
Totals	143	174	162	122	50	0	0	152	803

Table 5. Indices of relative abundance for the Smith's Blue butterfly for every transect and survey day during its 1992 flight season at the Sand Dollar Shopping Center, measured by the number of butterflies observed per foot of transect. (Note: all index values should be multiplied by 10^{-3}).

	TRANSECT								Daily
Date	#1	#2	#3	#4	#5	#6	#7	#8	Index[b]
6/21	24[a]	101	43	32	52	--	--	52	31
6/26	61	159	161	100	97	--	--	80	68
7/1	79	210	114	97	116	--	--	92	72
7/7	110	165	137	15	19	--	--	19	58
7/11	18	85	31	11	--	--	--	21	17
7/12	27	57	43	11	--	--	--	31	19
7/15	24	68	31	18	--	--	--	92	17
7/17	27	51	31	7	6	--	--	5	13
7/19	6	11	4	4	6	--	--	5	4
7/23	24	57	27	29	12	--	--	24	18
7/28	15	17	8	4	6	--	--	7	6
7/31	6	11	4	4	6	--	--	5	4
8/4	6	--	--	4	--	--	--	--	1
8/7	6	--	--	4	--	--	--	--	1
8/12	--	--	--	--	--	--	--	--	--
								Seasonal Index[c] =	22

NOTES:

a) Daily transect index values were calculated by dividing the number of butterflies observed along the transect on a given day (Table 3) by the length of that transect (Table 1). For example, the daily transect index value for transect #1 on July 7th is: 36 butterflies/ 328 feet = 110.0 x 10^{-3} butterflies per foot.

b) A daily index for all eight transects was calculated by dividing the total number of butterflies observed on a particular date (from Table 3) by the length of all eight transects (2,452 feet from Table 1). For example, the daily index for July 7th is: 143 butterflies/2,452 feet = 58.0 x 10^{-3} butterflies per foot.

c) The seasonal index was calculated by dividing the total number of butterflies observed during the 15 survey days (803 in Table 3) by the length of all eight transects (2,452 feet) times 15 visits: 803/(2,452 x 15) = 22.0 x 10^{-3} butterflies per foot.

Transect #2 had the highest daily index values of the eight transects. No butterflies were observed along transects #6 or #7 throughout the entire flight season. Transect index values ranged from 0.0 to 210 x 10^{-3} butterflies per foot (Table 5).

Comparison of 1991 and 1992 index results suggest that population numbers increased in 1992 along transects #1, #2, and #5, probably due to increasing numbers of buckwheat flowers observed along these transects during 1992. Population numbers remained stable along transects #3 and #4. Nonetheless, the seasonal index for 1992 (22) was approximately one-half of the comparable 1991 index (44.8), which suggests an overall decline in butterfly numbers. The lack of observations along transects #6 and #7, throughout the butterfly's flight season, contributed to a lower seasonal index for 1992. When these two transects are omitted from the seasonal index calculation, the index increases to 33, which is only slightly lower than the 1991 index.

Another factor that may have influenced the relative estimates of butterfly abundance, was the differential timing of the 1991 and 1992 flight seasons. Examination of wing wear data for both years, suggests that the Smith's Blue flight season began approximately one month earlier in 1992 than in 1991. During 1992, butterflies were first active about June 10th and concluded their flight season by August 12th. The 1992 peak in adult numbers occurred during the week of June 26th, whereas we didn't even observe our first butterflies until July 12th in 1991. Even though we started our monitoring surveys on June 21st in 1992, the butterfly had already been active for about 10 days, thus we missed some of the early emergence period, which could have dampened our seasonal index value for 1992.

The lack of butterfly observations in Management Area #3B and the adjacent railroad right-of-way, suggests that the Smith's Blue butterfly is not now utilizing this area. This is the second year that we have not observed any adults of the Smith's Blue using this area. Since many of the buckwheats growing in area #3B are juvenile or senescent plants, which do not produce as many flowers as robust mature plants, the lack of butterfly observations is not surprising because the butterfly obtains nearly all of its larval and adult nutrition from the flowers of the buckwheat. In addition to the transect monitoring, we spent nearly an additional 40 hours, scattered over 15 visits, searching for Smith's Blue in Management Area #3B. All search time was during good weather conditions, and on days when Smith's Blue adults were active at other Management Areas of the shopping center. Because adults of Smith's Blue adults were not observed here, coupled with the relatively few numbers of buckwheat flowers, it is unlikely that the butterfly is breeding in this portion of the shopping center at this time.

LITERATURE CITED

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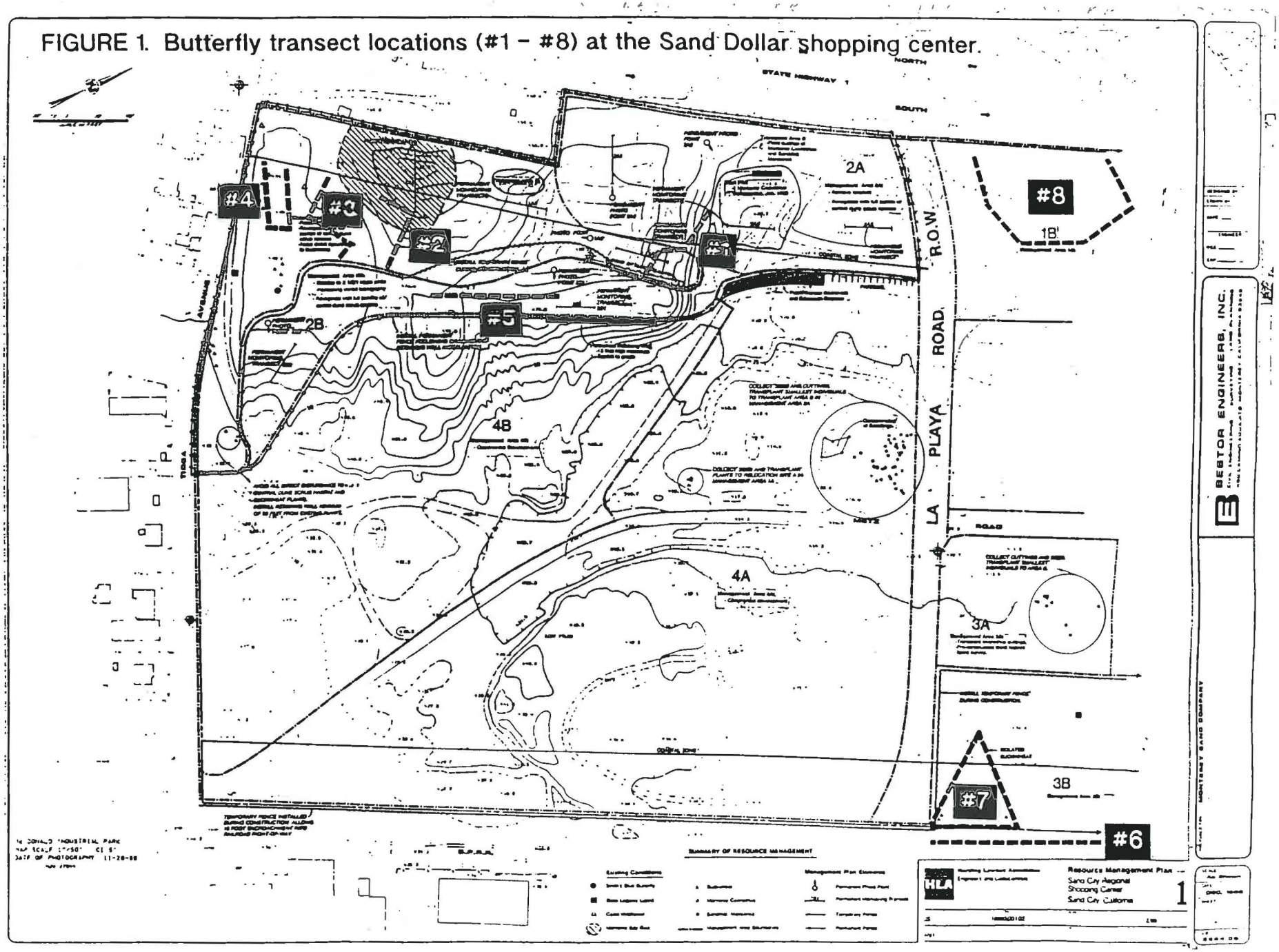
FIGURE 1. Butterfly transect locations (#1 – #8) at the Sand Dollar shopping center.



APPENDIX D

CALTRANS MITIGATION PLAN

FOR BURNS CREEK BRIDGE REPLACEMENT PROJECT

(SMITH'S BLUE BUTTERFLY)

Propagation of Seacliff Buckwheat as Mitigation for the Burns Creek Bridge Replacement

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INTRODUCTION

The California Department of Transportation has begun environmental and engineering planning to replace the Burns Creek bridge along State Route 1 about 3 miles south of the Julia Pfeiffer Burns State Park in Monterey County. PAR Environmental Services, Inc., has conducted field studies to document the biological resources that could potentially be affected by the bridge replacement project. Among the resources that would be affected by the project is a colony of the seacliff buckwheat (*Eriogonum parvifolium* Smith in Rees.), which hosts a segment of the locally occurring metapopulation of the federally listed endangered Smith's blue butterfly (*Euphilotes enoptes smithii*) (Smith's blue).

Smith's blue are totally dependent on two buckwheat species, the seacliff buckwheat and the coast buckwheat (*E. latifolium* Smith in Rees.). The emergence of Smith's blue is synchronized with flowering of the buckwheat species. Adults of both sexes use the plants as primary nectar sources and as sites for resting, sunning, mate location, and copulation. Neither sex strays significant distances from buckwheat colonies. Female Smith's blue oviposit in buckwheat flower heads and larvae feed exclusively on flower heads. Pupation occurs in both flower heads and in sand and litter at the base of host plants. Pupae form from mid-August to September and remain in place until the buckwheats flower the next year (U. S. Fish and Wildlife Service 1984). Prolonged diapause where pupae remain dormant in soil and litter through 1 or more years of unfavorable conditions are suspected in Smith's blue (Porter 1989).

Jones & Stokes Associates was retained to prepare a conceptual plan for establishment of new seacliff buckwheat colonies in the vicinity of Burns Creek to mitigate for impacts to the Smith's blue. The goal of this plan is to develop a propagation program that would provide for the timely establishment of new seacliff buckwheat colonies that could offset impacts to the Smith's blue.

The following objectives were established to accomplish the above-stated goal:

- determine the state-of-the-art with respect to the collection and propagation of seacliff buckwheat, and the establishment of new seacliff buckwheat colonies;
- identify the number of plants and colonies (i.e., mitigation ratios) that should be successfully established to offset impacts to the Smith's blue;
- identify the criteria that should be used in selecting appropriate sites for the establishment of new seacliff buckwheat colonies;
- evaluate the feasibility of enhancing seacliff buckwheat colonies existing in the vicinity of Burns Creek to offset impacts to Smith's blue; and

- identify the monitoring and maintenance requirements necessary to ensure successful establishment of seacliff buckwheat and mitigation for impacts to Smith's blue.

METHODS

Information presented in the report is based on telephone interviews with individuals knowledgeable in the propagation of seacliff buckwheat, and review of published and unpublished literature on the Smith's blue. No published or unpublished reports on seacliff buckwheat propagation were located during the course of this study. An exhaustive literature search was not conducted and was beyond the scope of this study. Several individuals in Monterey County are actively involved with the propagation of seacliff buckwheat and other coastal species and their combined knowledge, gathered from telephone interviews, provided the basis for the propagation plan presented below.

RESULTS

Pertinent Aspects of the Biology of the Seacliff Buckwheat

Seacliff buckwheat is a perennial species that inhabits stabilized back dunes, coastal terraces, seacliffs, and foothills along the immediate Pacific Coast from Monterey County south to San Diego County, and more inland habitats in Ventura County where plants occur at elevations of up to 2,250 feet (Reveal 1989). In the Burns Creek region, seacliff buckwheat was not observed above 1,000 feet, which corresponds with the upper limit of the marine inversion layer or "haze level" (Porter 1989). Porter further observed that the California buckwheat (*E. fasciculatum*) appeared to replace seacliff buckwheat above this elevation in and near the Burns Creek study area.

Seacliff buckwheat is an early-successional species in coastal sage scrub habitats near Burns Creek (Porter 1989), and probably elsewhere within its geographic range. This conclusion is based on observations at Burns Creek where one population was found on a naturally disturbed slope of unstable, crumbling, rocky substrate, and a number of other colonies occupied human-made disturbed habitats, primarily steep roadcuts. Roadcuts represent analogs to natural early-successional habitats because of the absence of dense, woody vegetation such as the coastal sage scrub that dominates hillsides in the region, and because of the presence of steep, unconsolidated soil with little or no horizonation. Lone plants of the seacliff buckwheat occur infrequently in the coastal sage scrub near Burns Creek. The species apparently tolerates fire as most of the Burns Creek area was burned in 1986, but no evidence of expansion into burned coastal sage scrub was observed (Porter 1989).

Seacliff buckwheat flowers from April to October (Reveal 1989), but a majority of the flowering in the Burns Creek area was confined to the June to September period during 1989 (Porter 1989).

Seacliff buckwheat sets seed throughout late summer and fall as flower heads mature. The species produces abundant seed and seed viability approaches 100 percent (Moss, Kreiberg, Kaphert pers. comms.). Mature flower heads with abundant seed can be easily collected during late summer and fall. Collection during late September and October is recommended to avoid disturbing the Smith's blue larvae, which actively feed in seacliff buckwheat flower heads before this time.

Seed germination is stimulated by the first fall rains, and may continue throughout the winter season (Kreiberg, Moss pers. comms.). Seedling survival is dependent on climate as the young plants require regular precipitation to facilitate root growth and plant establishment before the onset of the dry late spring and summer seasons.

First-year seedlings are capable of flowering during the summer following germination if climatic conditions were favorable allowing plants to become well established increasing their ability to withstand stress during the summer drought period. Flowering during the second season is almost certain.

Flowering of seacliff buckwheat plants at Burns Creek was related to exposure and aridity. Colonies exposed to direct sunlight throughout most of the day initiated flowering in June; were flowering robustly throughout June, July, and early August; and had nearly completed flowering by late August (Porter 1989). Porter reports that those portions of seacliff buckwheat colonies that received partial morning or afternoon shade initiated and completed flowering later in the year than plants in exposed situations. This is an important distinction because adult Smith's blues at Burns Creek were most abundant and ovipositing during July and August (Porter 1989) Larvae reside and feed on seacliff buckwheat 4-8 days after oviposition but do not mature into pupae until mid-August to September (U. S. Fish and Wildlife Service 1984).

Flowering of plants raised under greenhouse conditions or planted in the wild was related to soil moisture content (Kreiberg pers. comm.) who observed that plants watered during the summer season initiated flowering later than plants in analogous situations that were not provided with summer water.

Porter (1989) reports that seacliff buckwheat plants must achieve ages in excess of 5-7 years before they attain a level of maturity where Smith's blue will use them. He does not provide an explanation for this observation, and no information clarifying this issue was available in U. S. Fish and Wildlife Service (USFWS) (1984) or from the USFWS State Endangered Species Office (Nagano pers. comm.). Porter was in New Zealand during preparation of this report and was unavailable for comment (Heipel pers. comm.). The requirement for 5- to 7-year-old plants may relate to plant size or some physiological change that mature plants undergo.

Mitigation Goal

The mitigation goal was determined based on the objectives of minimizing the effects of a short-term deficit of seacliff buckwheat plants in the Burns Creek region, and fully compensating for short-term declines in the Burns Creek's Smith's blue metapopulation.

The Burns Creek bridge replacement will eliminate an estimated 150 seacliff buckwheat plants in one colony. Project construction would eliminate these plants in 1991. Because of the lag time between elimination of the plants and the establishment of a 5-year-old colony of seacliff buckwheat, the Smith's blue population will sustain a short-term decline in foraging and rearing habitat. The mitigation program is therefore designed not only to compensate for the direct loss of 150 seacliff buckwheat plants, but also to ameliorate the potential short-term decline in population size of the Smith's blue resulting from the temporary absence of 5-year-old plants.

In order to mitigate both the direct loss of seacliff buckwheat plants and the short-term decline in number of plants, the USFWS recommends a 15:1 ratio of successfully established plants to plants eliminated (Nagano pers. comm.). This high ratio will theoretically allow the Smith's blue population to rebound in the long-term by causing a net increase in the number of plants thus offsetting short-term declines resulting from bridge construction.

The 15:1 ratio requires that 2,250 seacliff buckwheat plants be successfully established. If 90 percent of the nursery-grown plants are successfully established at the site (Moss, Kreiberg, Kaphert pers. comms.), 2,500 plants would have to be planted.

Mitigation Site Selection

The selection of mitigation sites should be based on the combined requirements of the seacliff buckwheat and the Smith's blue metapopulation. The Burns Creek metapopulation is believed to be near the minimum viable population size based on the small size of buckwheat colonies, small number of adult and larval Smith's blue observed in the area, and because any particular patch of buckwheat seems unable to sustain a viable Smith's blue population for more than a few generations (Porter 1989). The apparent poor status of the Burns Creek metapopulation indicates that the compensation effort should be directed at maintaining and possibly enhancing the Burns Creek metapopulation, rather than establishing new buckwheat colonies in more distant areas.

Seacliff buckwheat has a wide latitudinal and elevational distribution. The species is associated with a variety of environmental conditions and vegetation associations within its range, but appears to require natural or artificially disturbed (i.e., early-successional) habitats where competition from taller and more aggressive shrubs and herbaceous species is minimal. Most populations in the Burns Creek area are located on old road cutbanks

(Porter 1989). The selected mitigation sites should therefore include sparsely vegetated, recently disturbed habitat.

Another important habitat requirement that should be considered relates to competition with native shrubs and non-native species. Mitigation sites should not support young-growth stands of coastal sage scrub or be located in areas where they would be susceptible to rampant invasion by pampas grass or iceplant. Pampas grass and iceplant will invariably show up in any plantings in the region, but compensation sites should not be situated downslope of well-established colonies of either species.

Exposure to sun and shade is another important consideration. Smith's blue utilizes most of the seacliff buckwheat colonies studied by Porter (1989) at the Burns Creek site. Butterflies were concentrated in the larger "primary" patches and were evenly distributed among them. Some Smith's blue were also observed using the smaller "secondary" patches. Of critical importance, however, in selecting replacement sites, is the possible value of the colony slated for removal to the long-term survival of Smith's blue metapopulation at Burns Creek. Plants at the site slated for impact (Patch 4 of Porter 1989) reached peak flowering relatively late in the year (i.e., August-September) compared with other patches in the vicinity.

The late phenology of Patch 4 was believed by Porter to be due to morning and afternoon overstory shading. Porter surmises that survival of Smith's blue in the Burns Creek metapopulation may require the existence of this colony because it has a greater probability of flowering abundantly during August-September when Smith's blue adults and larvae are most actively feeding and pupae are developing. Late-summer flowering is advantageous because it ensures that some plants are available to Smith's blue (especially larvae developing into pupae) during years with below normal precipitation or hot summers when seacliff buckwheat colonies occupying exposed sites have already completed flowering. Porter believes that the late-summer flowering colony may provide a safeguard against local extinction of Smith's blue and may serve as one or the only areas capable of sustaining the Burns Creek metapopulation through unfavorable years. Seacliff buckwheat colonies that consistently flower in late summer may represent source areas from which Smith's blue individuals can emigrate to less-optimal sites when climatic conditions and buckwheat flowering are more conducive.

Other important considerations for selection of the compensation site include ease of access for planting and maintenance. Roadside localities are well suited for these activities, and Porter (1989) concludes that roadside habitats are not detrimental to either adult or larval Smith's blue.

The information presented above indicates that the ideal compensation site should have the following characteristics:

- recently disturbed road cutbanks,
- not located downslope of hillsides supporting well-established populations of iceplant or pampas grass,

- o located as close as possible to the Burns Creek metapopulation so that the site can serve as a replacement for Patch 4 and be accessible to displaced Smith's blue butterflies, and

- o morning and afternoon shading to encourage a late-summer peak in seacliff buckwheat flowering.

Summary of Proposed Mitigation Planting Strategy

An overview of the strategy for establishing new seacliff buckwheat colonies is presented in this section. A detailed explanation of the various steps is provided in the following sections.

The available information indicates that the most advantageous method for establishing a seacliff buckwheat colony of sufficient size within an appropriate time frame to mitigate impacts at Burns Creek is to use live plants as opposed to direct seeding. Seed should be collected from the disturbed population and others in the immediate vicinity, raised in greenhouses until they are large enough for outplanting to mitigation sites. Frequent monitoring is recommended during the first winter and spring growing season to ensure plants are adequately watered and not suffering from soil erosion, predation, or competition with weeds.

The requirement to initially plant 2,500 plants may require the establishment of more than one colony because of limited space at any one suitable road cutbank.

Alternatively, a combination of direct seeding and outplanting of greenhouse-reared stock could be considered. For example, 1,000 plants could be targeted for planting from greenhouse stock, while direct seeding could be used to establish the remaining 1,500 plants. If direct seeding proves ineffective after one or two seasons of attempts, then the remaining plants could be established from greenhouse stock.

Another recommendation would be to evaluate the usefulness of enhancing seacliff buckwheat colonies near the impact site to increase plant numbers and overall longevity of the colony. Enhancements could entail the removal of existing competing vegetation (especially invading shrubs that dominate adjacent coastal sage scrub) and supplemental planting of plants raised in greenhouses.

A final aspect of this recommended mitigation plan entails replacement of the Patch 4 seacliff buckwheat colony after construction. Topsoil could be salvaged from the colony prior to impact in order to collect soil, buckwheat seed, and possibly diapausing Smith's blue pupae. Salvaged top soil could be reapplied to the new road cutbank and either seeded or planted with seacliff buckwheat. Salvaged soil may also be applied to newly established buckwheat colonies in an effort to introduce diapausing larvae. It is, however,

not known whether diapausing larvae could withstand the physical disturbance of the soils; larvae could be crushed, or buried too deep upon soil reapplication.

Seed Collection and Storage

Seacliff buckwheat seed should be harvested directly from live plants at the impact site and nearby. Seed from seacliff buckwheat colonies on sand dunes and other habitats differing markedly from road cutbank habitats should be avoided. Seed should be collected during late September and October from plants with mature flower heads. Mature flower heads can be identified by examining heads with dry flowers and determining if mature seed is present. The seed of buckwheat species is actually contained in a type of fruit, termed an ackene, that falls easily when mature flower heads are shaken or crushed.

Seacliff buckwheat seed should be stored in breathable containers. Cloth sacks are preferred although paper is acceptable. Gas exchange is necessary to vent gases produced by seeds and prevent moisture buildup, which can lead to decay from bacterial or fungus growth. Seed should be stored without refrigeration in a cool, dry, dark location.

Project construction is not scheduled to begin until 1991 (Heipel pers. comm.). Therefore, the opportunity to collect seed during the following years does exist. Supplemental seed collection could be used for future mitigation projects, or to reattempt mitigation for the Burns Creek project if the first attempts do not meet with complete success.

Propagation

Seacliff buckwheat can be propagated from seed, cuttings, or by planting greenhouse-raised stock. The latter technique is proposed as the most advantageous because of its high rate of success and rapid rates of plant establishment and growth during the first year.

Seacliff buckwheat seed has a high rate of viability (Moss, Kreiberg, Kaphert pers. comms.). No seed scarification or vernalization requirements are known or used (Kreiberg, Kaphert, Moss pers. comms.). Direct seeding of seacliff buckwheat can be successful (Moss, Kreiberg, Kaphert pers. comms.), but is relatively risky. Direct seeding of seacliff buckwheat in experimental sites with proper levels of disturbance and vegetative cover yielded very poor results for this species, as well as several other herbaceous coastal species (Moss pers. comm.). Probable risk factors accounting for poor establishment include the reliance of successful seedling establishment on climate (Moss, Kreiberg, Yadon pers. comms.), the need for seed to land at a "safe site" where germination and establishment are possible, the effects of predation on seed and newly emerged seedlings, and wind and water erosion on exposed road cuts.

Climate is important because the amount and distribution of rainfall are critical factors regulating seedling establishment. Seacliff buckwheat will germinate with the first fall rains and requires regular rainfall to successfully establish. Sufficient rainfall ensures that the newly emerged seedlings will not die from lack of water during the periodic dry periods that often characterize the winter and spring season, and that the plants will be able to root deep enough to sustain growth during hot summers. Dry spells during mid-December to late December are characteristic of the Big Sur region (Kreiberg pers. comm.).

Seed broadcast in open, disturbed areas can be consumed by rodents, birds, and insects. Burying the seed can help overcome this problem. Another difficulty associated with seeding open road cutbanks is wind and water erosion. Sites that are routinely exposed to coastal breezes can sustain damage from erosion and loss of seed and topsoil. Water erosion caused by intense winter-spring storms can wash away topsoil and seed from sloped road cutbanks.

Although direct seeding is risky, it should be considered an option. Properly cared for seeded sites could possibly establish seacliff buckwheat colonies. Seeded sites should be monitored and the need for supplemental watering anticipated in advance. Seeded sites should be monitored weekly and provided with supplemental water whenever rain ceases for 1-2 weeks.

Rooted cuttings probably could be made from seacliff buckwheat, considering the success this technique has exhibited when applied to other buckwheat species (Kreiberg pers. comm.). None of the practitioners interviewed for this study recommended this technique, however, primarily because of the tremendous success associated with plants raised from seed in greenhouses.

All individuals interviewed for this study recommended that seacliff buckwheat be established by planting young plants raised from seed in greenhouses. Moss, Kreiberg, and Kaphert (pers. comms.) report a 90- to 99-percent success rate with plants raised in greenhouses when adequate care is provided and experienced persons assume responsibility for the planting phase. Use of greenhouse-grown plants is preferred over direct seeding in the field because the successful establishment of seed is contingent on precise combination of climatic and soil conditions, along with absence of predation, soil erosion, and massive seedling die-off from fungus attack. Direct seeding is also risky because of the large amount of seed required to establish plants. Plants raised in greenhouses before outplanting have well-developed root systems and therefore can establish quickly. Some believe plants raised initially in greenhouses and then outplanted have a 6- to 12-month head start (toward maturity) as opposed to plants established by direct seeding in the field (Yadon, Kreiberg pers. comms.). Another advantage to using potted plants is their reduced susceptibility to predation because of their larger size and because they can be immediately protected with temporary protection kits.

Based on the above information, this study recommends the use of potted plants raised in a greenhouse from seed collected in or near the project area and possibly

supplemented with direct seeding. A methodology for establishing potted plants is presented below.

Seed should be sown in flats with a standard greenhouse potting mix. Two or three times as many plants as are desired for greenhouse propagation should be raised in the flats to provide an adequate supply of healthy seedlings. Kreiberg (pers. comm.) recommended that the soil have a low vermiculite or peat content because it reduces the soil's ability to dry and therefore can cause mold and fungus problems. Sand should be added to the soil to enhance drainage. Once the seed has germinated and attained heights of several inches, plants should be transferred to 7-inch Supercells and left in a greenhouse for 6 or more weeks.

Kreiberg (pers. comm.) believes that after 6 weeks growth in Supercells the plants could be ready for planting. Moss (pers. comm.) believed this could be too soon for planting and recommended that the plants be assessed at this stage rather than assuming they would be ready. Moss (pers. comm.) considered 3 months of growth in the greenhouse as optimal. Seedlings should be ready for planting when they have four or more sets of leaves (Kreiberg pers. comm.).

Site Pretreatment

The selected mitigation site may benefit from pretreatment if it is not sufficiently disturbed, if wind or water erosion could be a problem, or if it appears that weeds or established shrubs could compete with seedlings.

Seacliff buckwheat appears to favor disturbed sites where competition with weeds or shrubby plants is reduced. Disturbed soil may also stimulate germination. If the selected mitigation sites are relatively stabilized (i.e., the soil surface is consolidated or a surface hardpan has formed), it could be advantageous to scarify the soil surface by walking a track-driven bulldozer on the slope or using a spike-tooth harrow.

Soil erosion is always a consideration when planting disturbed road cutbanks. Sites exposed to constant, predictable coastal breezes could be subject to wind erosion if the soil substrate is highly mobile. Abatement of wind erosion has been accomplished by creating obstructions to surface wind movement with straw. Straw "planted" upright and buried about one-third to one-half the length of the straw on 1- or 2-foot centers substantially reduced, and in some instances eliminated, wind-generated sand movement on coastal sand dunes (Ferreira and Gray 1987). Straw can also be "punched" into sandy soil with a crimper or square-nosed shovel prior to planting (Moss pers. comm.).

Water erosion is also a concern on steep road cutbanks. Water erosion can be effectively controlled by making small water bars and applying a layer of straw to the soil surface. Rice straw is best because it is generally free of weed capable of establishing on road cutbanks.

If the selected mitigation site supports an extensive seedling stand of shrubs that dominate coastal sage scrub, then it may be important to eliminate the shrubs in order to prevent future competitive problems. Problems could arise after the coastal sage scrub species have become sufficiently large to dominate the site and exclude less competitive species such as the seacliff buckwheat. Shrub seedlings could be removed manually or in conjunction with soil scarification.

If an abundance of annual grass or noxious exotic weed growth is established at the mitigation site, it would be very advantageous to first control this vegetation. Weedy vegetation of the Big Sur region is highly competitive and can effectively eliminate less competitive vegetation, especially seedlings, because of an ability to more effectively exploit soil moisture and nutrient reserves. Control and removal of dense or extensive weed growth is best accomplished using an herbicide prior to planting or seeding. Roundup is very effective at eliminating competing weed growth, and it rapidly breaks down to innocuous compounds in the soil, thereby allowing for planting soon after its application. Moss (pers. comm.) has successfully used Roundup to control iceplant and pampas grass. For iceplant, Moss uses a very light application rate of 0.5-0.75 percent Roundup (1 ounce per gallon); this light dose readily kills iceplant but does not always kill established natives accidentally exposed by wind drift or misapplication. For pampas grass, Moss uses a 2-percent mixture of Roundup.

Iceplant and pampas grass can be expected to continuously reinvade disturbed roadside areas, a problem addressed below under maintenance.

Timing of Planting

Nursery-raised seacliff buckwheat can be successfully planted throughout the fall, winter, and spring. Planting should not occur until after the rainy season has begun. Planting should not occur after late February (Moss, Kreiberg pers. comms.). Once ready for planting, the greenhouse-raised seedlings should be transported to the mitigation site. Seacliff buckwheat should be planted on 3- or 4-foot centers because mature plants can grow to diameters of 2 or more feet. Only persons skilled in the use of Supercells and planting of native seedlings should be used in this step because it is easy to accidentally kill plants.

After a year or two, when seacliff buckwheat plants are well established, the intervening areas could be seeded with native forbs or grasses to provide a more natural setting, reduce erosion, and inhibit establishment of undesirable weedy species.

Weed Control and Supplemental Watering

Newly planted seacliff buckwheat plants should be provided protection from weeds by encircling each plant with a "weed fabric" that prevents establishment of new plants. Three-foot-square weed fabric stapled at each corner should be used.

Project proponents may want to consider the installation of a watering system or some other provision to provide supplemental water. Nursery-raised plants are especially sensitive to water stress because they do not develop the same amount of root growth per unit leaf area as do plants that propagate in the ground. Consequently, plants will require immediate attention to prevent massive die-off from extended dry periods during winter or spring. An emergency preparedness plan should be in place to respond to supplemental watering needs rapidly. Water could be provided by a hose connected to a water truck. Direct spraying from a water truck spray rig should *not* be attempted because it can uproot plants and cause extensive erosion. Ideally, a supplemental watering system should be installed at the time of planting. A 2-inch trunk line with "quick couplers" could be installed relatively easily. Rain bird or hoses could then be attached to the couplers and water provided with a truck and a water pump attached to the trunk line.

Fertilization

Fertilization of plants should be minimized because this practice leads to dependency on artificial fertilizers, promotes growth of highly competitive weeds, and may have detrimental effects on soil mycorrhizae. Although seacliff buckwheat is not documented to have a mycorrhizal relationship, it is a distinct possibility based on the prevalence of this relationship among many plants.

Moss (pers. comm.) suggested it could be advantageous to fertilize plants in Supercells just prior to planting with a water-soluble 20-20-20 fertilizer.

Maintenance and Monitoring

Maintenance in the early stages from planting through the first summer is especially critical. During this stage plantings could fail because of inadequate water, predation, erosion, and competition from other vegetation.

The mitigation plantings should be monitored weekly for the first month after planting to ensure no immediate problems arise. More frequent monitoring is advisable if heavy rainfall ensues during this initial stage. After the first month the plants should be monitored every 2 weeks through May. Monitoring during June through September should be monthly. A person skilled in native landscape management and familiar with seacliff

buckwheat propagation should be used, preferably the same person who implements the planting program.

During each monitoring visit seacliff buckwheat plants showing evidence of water stress should be provided with water. The most important item to monitor during the first winter, and again in spring, is the amount and distribution of rainfall. It is not unusual for the central coast area to experience dry spells of 1 or more weeks during this period when high-pressure systems develop off the coast. If a 2 to 3-week period elapses without 0.5 inch or more of precipitation at the planting site, then the plants should receive supplemental water. Water could easily be provided from a truck if road cutbanks are used for the mitigation site. Supplemental watering will not be required after the first winter-spring season because surviving plants will have well-established root systems by that time.

Seacliff buckwheat plants should not be watered from June until the onset of rainfall in fall. Summer irrigation can induce invasion of weedy species, suppress development of deep root systems capable of withstanding summer drought, and prevent or forestall normal flowering. Plants that show signs of summer water stress should be sparingly watered if they appear to be near death (Kreiberg pers. comm.).

One of the most important tasks of early maintenance is the elimination of weedy vegetation. All plants established within 1 foot of seacliff buckwheat plants should be hand pulled. Pampas grass and iceplant seedlings anywhere in mitigation sites should be removed.

If evidence of erosion is detected, remedial action should be undertaken to eliminate the source of erosion. Construction of additional water bars, whereby overland water runoff from upslope could be routed around planted areas, could be attempted. If wind erosion appears to be a problem some additional type of wind brake could be installed, or straw plantings (if used) could be replaced or their density increased.

If vertebrate herbivory is identified as a problem, the plants could be protected with wire mesh or fencing.

Cost Estimate

Costs of implementing the mitigation program are estimated below. Separate estimates are provided for direct seeding and planting of greenhouse stock. Note that the cost of seed collection, transportation, logistics planning, maintenance, and project supervision and management are not considered in the below estimates. Costs of these tasks would be roughly the same for seeding or planting although maintenance of seeded plots could more labor intensive, and it may require several seeding efforts to establish a sufficient number of plants.

Direct Seeding

Direct seeding costs are relative low but have a low degree of obable success, as explained above. The total cost of direct seeding would run about $3,000-4,000, not including postseeding maintenance. The figure includes 1 day's use of a tractor and operator to scarify the soil, 1 person-day to seed the site, and 3 person-days to apply straw and build any needed erosion control structures.

Planting

The planting of greenhouse stock is considerably more labor intensive than direct seeding but has a much higher probability of success and will provide mature plants to Smith's blue sooner. The total estimated cost of planting greenhouse stock is $8,375, not including postplanting maintenance. The total cost is based on the following breakdown: $2,000 for site pretreatment; $4,375 for greenhouse propagation; and $2,000 for planting (with weed cloth) in loose, unconsolidated soil.

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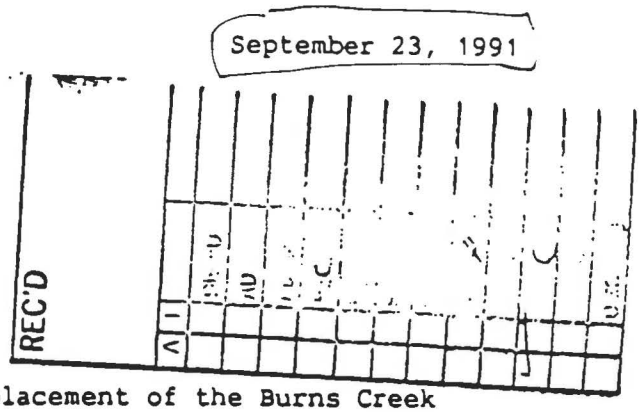

Mr. Lyle P. Renz
Acting Division Administrator
Federal Highway Administration
California Division
P.O. Box 1915
Sacramento, California 95812-1915

Re: Biological Opinion for the Proposed Replacement of the Burns Creek Bridge, State Route 1, Monterey County, California (1-6-91-F-38)

Dear Mr. Renz:

This Biological Opinion responds to your May 17, 1991, request for formal consultation with the Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (Act), on a proposal by the California Department of Transportation (Caltrans) to replace the Burns Creek bridge (No. 44-50) along State Route (SR) 1 in Monterey County, California. Your request was received in this office on May 24, 1991. At issue are the potential effects of the proposed bridge replacement and realignment of the road approachments on the Smith's blue butterfly (Euphilotes enoptes smithi) and the American peregrine falcon (Falco peregrinus), both federally listed endangered species.

This Biological Opinion was prepared using information contained in the Natural Environment Study Report, Burns Creek Bridge, dated August 1989; the Biological Assessment and Proposed Mitigation Plan, dated July 23, 1990; the Initial Study/Environmental Assessment, Burns Creek Bridge Replacement, prepared April 1991; and the Propagation Of Seacliff Buckwheat As Mitigation For The Burns Creek Bridge Replacement Project dated November 15, 1989, and revised April 11, 1990.

Biological Opinion

It is the opinion of the Service that the proposed project is not likely to jeopardize the continued existence of the Smith's blue butterfly or the American peregrine falcon. Critical habitat has not been designated for these species; therefore, none will be adversely modified or destroyed.

Description of the Proposed Action

The purpose of the project is to alleviate structural and operational deficiencies of the existing Burns Creek bridge, improve traffic safety, and remove the current load limit restrictions. The bridge has had no major

structural improvements since it was built in 1935. Because of structural deficiencies, the bridge has been posted for a reduced live load limit of 30 tons since 1988. The existing bridge is a steel structure with steel frame towers supported on concrete footings. Corrosion of the steel members has affected the structure's load-bearing capacity, requiring the repair or replacement of the existing structure.

The proposed preferred project alternative would consist of the replacement of the existing bridge with a new concrete structure spanning Burns Creek Canyon. The proposed design would include vertical supports and cast-in-place and prestressed concrete box girders for each of the three spans. The proposed work would essentially utilize the existing road and bridge alignment, though there would be an 8-foot adjustment in the bridge centerline to the east to accommodate traffic during construction and to avoid adversely impacting an archaeological site adjacent to the existing structure.

The preferred project alternative would create two 12-foot traffic lanes and two 4-foot shoulders. The 3 bridge spans would total 414 feet in length. Additional roadwork to the bridge approaches would be required to accommodate the shift in the bridge alignment. That work would require tapered road realignment, new road cuts, and the repaving of approximately 500 linear feet of road on each side of the bridge. The proposed bridge realignment would also require the acquisition of new right-of-way totaling approximately 1,000 square feet.

The proposed construction work would be conducted in stages. The construction of the replacement bridge would proceed while portions of the existing structure would remain in place to facilitate traffic flow. As construction of the replacement bridge progresses the original bridge would be demolished and removed. The existing concrete foundation frames would remain in place to minimize disturbances to the soil and vegetation in Burns Creek Canyon. The installation of the replacement bridge would require access into the canyon to construct shoring, falsework, and the new piers. According to the July 23, 1990, biological assessment, access into the canyon could be effected parallel to the bridge by scaffolding or by hi-lining, thereby restricting construction Division impacts to a 150-foot-wide area (i.e., 75 feet in each direction from the centerline of the new structure). The use of tower cranes, conventional cranes, and high line cables would limit construction disturbances of the coastal scrub habitat to approximately 0.1 acre.

The proposed replacement of the bridge, the construction of new approach roadways, and the removal of the existing bridge structure would adversely affect up to 3 acres of coastal scrub habitat. The construction of new approach roadways would require the removal of approximately 150 specimens of a stand of seacliff buckwheat (Eriogonum parvifolium), the primary host plant for the federally listed endangered Smith's blue butterfly.

Several pre-project and post-project actions shall be employed, as part of the project proposal described in the Propagation Of Seacliff Buckwheat In The Mitigation For The Burns Creek Bridge Replacement Project and the Initial Study/Environmental Assessment, to mitigate anticipated adverse effects to endangered species and associated habitats. These actions are:

1. Topsoil shall be salvaged from the seacliff buckwheat colonies slated for removal for the purpose of introducing seed of both the seacliff buckwheat and associated native plants.

2. A combination of seeds collected from existing seacliff buckwheat plants and greenhouse raised seedlings shall be used to revegetate buckwheat on the exposed cut slopes along State Route 1 to the north and south of the project area.

3. The late-blooming buckwheat patch slated for removal shall be used as a primary source for replacement plants, and a site with similar environmental conditions (i.e., slope, aspect, exposure) shall be selected for the revegetation site.

4. Replacement seacliff buckwheat shall be successfully established at a ratio of 15:1, or a total of 1,350 plants.

5. Mortality to more than 10 percent of the buckwheat population shall be corrected by additional plantings of seedlings by Caltrans.

6. A seven-year monitoring program, designed to evaluate the success of the mitigation measures, shall include 10 visits to the site between mid-June and mid-September of each monitoring year to conduct a census of both the seacliff buckwheat plants and the Smith's blue butterfly populations.

7. An annual report that analyzes the census data shall be provided to the Service and the California Department of Fish and Game by December 31 of each year.

8. The annual report shall provide analysis of butterfly population size; spatial distribution; a discussion of trends in size, availability, and condition of buckwheat plants; maps showing the locations of butterfly observations and buckwheat plants; and discussion of potential future threats to the mitigation site and mitigation measures. All pertinent data shall be accessioned into the entomology section of the Natural History Museum of Los Angeles County or the California Academy of Sciences.

9. Caltrans shall reseed freshly disturbed cut slopes along State Route 1 in Monterey County with seacliff buckwheat and shall provide long-term monitoring to assess the effectiveness of the measure and in assessing the health of seacliff buckwheat and Smith's blue butterfly populations.

10. Caltrans shall re-establish the native coastal scrub community disturbed during construction activities (new road cuts, canyon access) by using cuttings and seedlings taken from the plant stock slated for removal.

11. Construction fences shall be placed in the construction zone near the southern end of the existing bridge to prevent any inadvertent damage to the trees that measure greater than six inches in diameter.

Effects of the Proposed Action on Listed Species

Species Account

Details of the life history and biology of the Smith's blue butterfly are contained in the 1984 Recovery Plan for the Smith's Blue Butterfly. Smith's blue butterflies are totally dependent on two buckwheat species, the seacliff buckwheat and the coast buckwheat (Eriogonum latifolium). The emergence of the Smith's blue butterfly is synchronized with flowering of the buckwheat species. Adults of both sexes use the plants as primary nectar sources and as sites for resting, sunning, mate location and copulation. Neither sex strays significant distances from buckwheat colonies. Female Smith's blue butterflies oviposit in buckwheat flower heads and larvae feed exclusively on flower heads. Pupation occurs in both flower heads and in the substrate and litter at the base of the host plants. Pupae form from mid-August to September and remain in place until the buckwheat flowers the next year (U.S. Fish and Wildlife Service 1984). Prolonged diapause, where pupae remain dormant in soil and vegetative litter through one or more years of unfavorable conditions, are suspected in Smith's blue (Porter 1989).

The biological assessments prepared for the proposed bridge replacement project determined the adult Smith's blue butterfly population at Burns Creek to number approximately 100 adults per year. That population is distributed among eleven stands of seacliff buckwheat that occur within a one-half mile radius of Burns Creek bridge. These stands consist of five primary and six smaller patches, with isolated plants interspersed. All but three of the buckwheat patches occur in disturbed roadcut areas along State Route 1.

There is a stand of buckwheat plants (approximately 150) located south of the bridge along the southeastern roadcut of State Route 1 where adult male Smith's blue butterflies were observed, and females had been seen laying eggs on the plants. Approximately 90 plants of that buckwheat stand would be eliminated by the construction of the new approach road for the bridge. Surveys conducted in the Burns Creek vicinity determined the Smith's blue butterfly population to number approximately 100 individuals in any single year. Although there are no absolute density estimates for the population of Smith's blue butterfly found in the vicinity of Burns Creek, it is estimated that up to 15 percent of the butterfly population could be eliminated by the construction of the new southern road approach. The remaining ten stands of buckwheat would be unaffected by the proposed work and would continue to provide primary habitat for the Smith's blue butterfly.

Potential project impacts on the Smith's blue butterfly include damage or destruction of their primary habitat (the seacliff buckwheat plant), the loss of pupating larvae found in the vegetative debris and soil by removal and/or crushing, and the loss of adult butterflies to heavy machinery and passenger vehicles operating about the remaining stands of seacliff buckwheat during construction activities. Since individual buckwheat plants occur in the roadcuts adjacent to the existing highway, there is a high probability that some Smith's blue butterflies are lost to passing vehicle traffic.

Smith's blue butterflies may also be indirectly affected by the proposed project actions through the immediate loss of available mature buckwheat plants. Although the proposed mitigation plans would replace the eliminated buckwheat population at a ratio of 15:1, it would take at least 5 years to re-establish a mature stand capable of providing the preferred habitat of the adult Smith's blue. In order to help establish mature stands of potential buckwheat habitat in as short a time as possible, the seeds of senescent seacliff buckwheat flower heads should be collected during late summer and fall and spread about the mitigation sites. The direct seeding of seacliff buckwheat would be in addition to the planting of greenhouse stock seacliff buckwheat. If mitigation work were implemented this year, the planted seed and/or greenhouse stock of seacliff buckwheat could be partially established prior to actual construction start-up.

Another less likely project impact, yet potentially catastrophic, is the event of an accidental fire resulting from construction activities that destroys one or more of the remaining buckwheat stands. As indicated in the seacliff buckwheat and Smith's blue butterfly surveys, all but three of the eleven stands of buckwheat at the Burns Creek site are located within 20 feet of State Route 1 in and along disturbed roadcuts.

There is the potential for the federally listed endangered American peregrine falcon to range within the Burns Creek bridge project area. The American peregrine falcon formerly nested throughout California, including the central coast region. Peregrine falcons nest on protected ledges of high cliffs found in woodland, forest, and coastal habitats (CDFG 1989). Peregrines are wide ranging birds that could utilize the project site vicinity while foraging for shorebirds or passerine birds, particularly in or near any wetland areas adjacent to Burns Creek. However, based on the information contained in the environmental assessments conducted for the Burns Creek bridge project and the California Natural Diversity Data Base, the Service believes that any potential adverse impacts to the peregrine falcon would be short-term and limited to isolated instances of perching or foraging. The Service anticipates no adverse impact to the peregrine falcon by the proposed work.

Analysis of Impacts

The proposed action could result in the disturbance of up to 3 acres of coastal scrub vegetation if new roads are pioneered into the north and south canyon walls to provide access for construction equipment. Alternatively, if construction proceeds by means of scaffolding or by hi-lining the amount of coastal scrub habitat lost would be reduced to approximately 0.1 acre immediately adjacent to the bridge. To reduce the adverse impacts caused by construction activities, Caltrans would re-establish the native scrub-shrub plant community by employing a combination of seeding and/or using plant cuttings taken from the plants slated for removal. The Service concurs with the proposed strategy as long as the scrub-shrub restoration measures are implemented in a timely manner to preclude or reduce soil erosion caused by surface runoff during the rainy season.

Of major concern is the requirement to realign the southern road approach to the bridge. An estimated 90 seacliff buckwheat plants along the southeast

side of State Route 1 would be eliminated by the road approach realignment. Because of the lag time between elimination of the plants and the establishment of a mature (five-year-old) colony of seacliff buckwheat, the Smith's blue population would sustain a short-term reduction in foraging and rearing habitat. In order to mitigate the direct loss of seacliff buckwheat plants and the short-term decline in the number of mature plants, the Service recommended a 15:1 ratio of successfully established plants to plants eliminated (Nagano 1989). The high ratio would theoretically allow the Smith's blue population to rebound over the long-term by providing an increase in the number of plants, thereby offsetting the short-term declines resulting from the construction of the approach road.

The 15:1 replacement ratio requires that 1,350 seacliff buckwheat plants be successfully established. In order to obtain 90 percent success rate of established plants, 1,500 seacliff buckwheat would have to be planted.

To further increase habitat for the Smith's blue to potentially colonize on and off-site within Monterey County, Caltrans proposes to establish strong colonies of seacliff buckwheat by seeding existing roadcuts, seeding all new road construction with this plant, and reseeding freshly disturbed right-of-ways with this plant after maintenance projects are completed. The Service supports this strategy because: the Seacliff buckwheat grows well in disturbed sites; habitat enhancement would utilize public rights-of-way rather than having to acquire new parcels; the rapid creation or expansion of habitat for the Smith's blue and; the potential for increased populations of Smith's blue to eventually warrant delisting from the endangered status. The establishment of other buckwheat colonies near the project site would also potentially provide new habitat areas for the Smith's blue population to move into as existing habitat(s) are lost through senescence and vegetation succession.

Cumulative Effects

Cumulative effects are those impacts on endangered or threatened species or critical habitat of future State, local government, and private actions that are reasonably certain to occur during the course of the subject activity. Future federal actions would be subject to the consultation requirements established under section 7 of the Act and, therefore, are not considered cumulative to the proposed action.

Future road maintenance at the project site could potentially adversely affect Smith's blue butterfly and/or its habitat. However, with Caltrans proposal to implement an aggressive seeding program of seacliff buckwheat in disturbed road cut areas on and off-site in Monterey County, the adverse impacts of any one future road improvement project to the Smith's blue butterfly could be lessened.

Habitat degradation caused by residential, recreational, or grazing uses are anticipated to be minimal as the Smith's blue butterfly habitat is basically confined to the disturbed roadcut areas adjacent to the highway or on the nearby eroded steep slope.

The improvements to the Burn's Creek bridge and road approaches are not anticipated to significantly change traffic use on State Route 1. Under the existing conditions it is probable that adult Smith's blue butterflies are lost to passing traffic. The bridge and road improvements would be expected, in the short-term, to reduce the number of Smith's blue butterfly adults using any remaining buckwheat plants located adjacent to the southeast road approach.

There is the danger of a fire igniting the scrub vegetation caused by construction related operations or by the careless disposal of cigarettes thrown from passing vehicles. Controlled burning of the scrub vegetation is unlikely given the presence of private residences in the vicinity.

The American peregrine falcon is believed to be an infrequent visitor to the Burns Creek area. The Burns Creek canyon contains habitat suitable for the peregrine to use while foraging or perching. The canyon does not contain suitable nesting sites for the peregrine falcon. The Service anticipates that the proposed bridge replacement project would not affect the peregrine falcon.

Our agency is aware of other projects currently under review by State, county, and local authorities where biological surveys have documented the occurrence of the Smith's blue butterfly and/or American peregrine falcon. These projects include urban development, mineral development, flood control, and reservoir construction. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species.

Incidental Take

Section 9 of the Act, as amended, prohibits the take of listed species without special exemption. Take is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Under the terms of sections 7(b)(4) and 7(o)(2) of the Act, taking that is incidental to and not a purpose of the agency action is not considered taking within the bounds of the Act, provided that such taking is in compliance with this Incidental Take Statement. The measures described below are nondiscretionary, and must be undertaken by the agency or made a binding condition of any grant or permit, as appropriate.

Project actions that are likely to result in the mortality, harm, or harassment of the Smith's blue butterfly have been discussed in this Biological Opinion. Because the early life stages (larvae) of these animals are not sufficiently vagile to evade the construction equipment, vehicles, or workers in their habitat or may be killed or injured through the loss of foodplant of the larvae, taking of this species would occur. The presence and activities of the equipment and humans in the habitat of the adult butterflies could also result in disturbance, harassment, or otherwise alter their resting, feeding, breeding, or other essential behaviors. The Service anticipates that an unquantifiable level of take of Smith's blue butterfly would occur as a result of the proposed action. This level is unquantifiable

because of the cryptic nature of the species and the extent of variation in the size of butterfly populations over a given period of time. The latter makes quantitative monitoring of individuals lost of this species infeasible. Therefore, the Service estimates the level of take in terms of habitat loss (i.e., acreage or the number of foodplants). Based on the available information, the Service anticipates that all of the butterflies (including larvae) that inhabit the ninety (90) seacliff buckwheat plants slated for elimination, identified in the environmental reports as Patch 4, would be lost as a result of the implementation of this project. This take would be in the form of harm, harassment, or killing of the animals as previously described.

The Service is assuming that the stipulations contained in this Opinion, as Reasonable and Prudent Measures and Terms and Conditions to reduce take, would minimize take associated with the proposed bridge installation and construction of the road approaches. This opinion does not authorize any form of take that is not incidental to the construction of the bridge and road approaches.

Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measures are necessary and appropriate to minimize the incidental taking authorized by this Biological Opinion:

1. Less than 0.1 acre of potential Smith's blue butterfly habitat would be subject to take by the installation and realignment of the road approaches;

2. The take of Smith's blue butterfly and butterfly habitat shall be minimized during construction activities and during future bridge/road maintenance operations;

3. Compensation for lost habitat shall occur at a ratio of 15:1 seacliff buckwheat plants successfully established for each plant destroyed, placed over an approximate 0.75 acre area as noted in the mitigation assessment for the proposed action which was included in the request for consultation; and

4. Other disturbed roadcut locations along State Route 1 in Monterey County shall be seeded with seacliff buckwheat to promote potential Smith's blue butterfly habitat.

Terms and Conditions

To comply with the reasonable and prudent measures contained in this Biological Opinion, the Federal Highways Administration and Caltrans must abide by the Terms and Conditions presented in this Opinion. These terms and conditions apply only for the incidental take of Smith's blue butterfly associated with the construction of the bridge and road approaches at Burns Creek bridge. Any other activity that results in a take of Smith's blue butterfly or Smith's blue butterfly habitat may be a violation of section 9 of the Act. These Terms and Conditions are as follows:

1. The project proponent shall designate an individual (a qualified biologist) as a contact representative who would be responsible for overseeing compliance with protective stipulations for the Smith's blue butterfly and coordination with the Federal Highways Administration, the Service, and California Department of Fish and Game. This would facilitate any discussions between the Service and the contact representative regarding the Smith's blue butterfly and alterations in project designs. If potential unauthorized take occurs, the contact representative shall have the authority to stop the construction work until appropriate corrective actions have been completed. The contact representative shall immediately report violations to the Fish and Wildlife Service's Ventura Field Station.

2. The construction right-of-way shall be clearly fenced, marked, or flagged at the outer boundaries to define the limits of construction activities. All construction workers shall be instructed that their activities shall be confined to locations within the fenced, flagged, or marked areas. Temporary asphalt storage, parking, temporary storage of work equipment, etc., shall not occur in existing buckwheat stands nor in sites selected for seacliff buckwheat planting(s) or seeding.

3. Prior to conducting any work at the site, all workers shall be informed of the occurrence of the Smith's blue butterfly in the area and the status of this species. The workers shall be advised as to the potential impact of the work to Smith's blue butterfly and the potential penalties (up to $25,000 in fines and six months in jail) for taking an endangered species.

4. The seven-year Smith's blue butterfly-seacliff buckwheat mitigation monitoring program shall be conducted by a qualified biologist familiar with conducting plant and butterfly surveys.

5. Seacliff buckwheat mitigation site selections shall be located within the Burns Creek vicinity to maintain and enhance the Smith's blue butterfly population.

6. Mitigation site selection shall not be located in areas containing young stands of coastal scrub or in areas with a high susceptibility to invasion by pampas grass or iceplant. Sparsely vegetated or recently disturbed open areas are preferred potential mitigation sites.

7. Seed stock and plantings derived from seed collected from the stand slated for elimination (Patch 4) shall be reintroduced to a similar habitat condition, i.e., mitigation site(s) subject to morning and afternoon shading to encourage a late-summer peak in seacliff buckwheat flowering.

8. Topsoil salvaged from Patch 4 prior to actual construction shall be reapplied to the new road cutbank and either seeded or planted with seacliff buckwheat. The salvaged soil may also be applied to newly established buckwheat colonies in an effort to introduce diapausing larvae.

9. Seacliff buckwheat seed shall be harvested directly from live plants at the impact site (Patch 4). Seeds shall be collected during late September and October from plants with mature flower heads. The seeds should be stored in breathable containers to allow the venting of gasses and prevent moisture development that may promote bacterial and fungal growth.

10. Any seeded mitigation site(s) shall be monitored weekly until the seacliff buckwheat colony is established to determine the need for any additional watering, the removal of invader weeds, and/or the maintenance and repair of eroded areas.

11. Nursery-raised seacliff buckwheat planting shall not occur until after the rainy season (late October-November) has begun. Planting shall not occur after February-early March. Any planting mitigation site(s) shall be monitored weekly until the seacliff buckwheat colony is established to determine the need for any additional watering, the removal of invader weeds, and/or the maintenance and repair of eroded areas.

12. If herbivore damage is determined in the mitigation area(s), the seacliff buckwheat plants shall be fenced or wire meshed to provide additional protection.

13. Herbicides or pesticides shall not be applied in the immediate vicinity of seacliff buckwheat plants or in areas where it could wash or drift onto areas occupied by the plants. This is necessary to prevent damaging or killing the seacliff buckwheat plant, adult Smith's blue butterflies, and/or their larvae.

Disposition of Sick, Injured, or Dead Specimens

The Service is to be noticed within three working days of the finding of any dead or injured endangered species during this project. The Service contact person for this information is Mr. Steven M. Chambers (805/644-1766 or FTS 983-6040). Any endangered species found dead shall be turned in to the California Department of Fish and Game. The agency contact is Dr. Larry Eng (916/445-1383).

If, during the course of the action, the amount or extent of the incidental take limit is reached, the Federal agency must reinitiate consultation with the Service immediately to avoid violation of section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible and adverse impact on the species, as required by 50 CFR 402.14(i). The Federal agency should provide an explanation of the causes of the taking.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term

"conservation recommendations" has been defined as suggestions of the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. In furtherance of the purposes of the Act, we recommend:

1. That construction methods employ scaffolding and/or hi-lining to minimize project impacts to the coastal scrub community immediately adjacent to the existing and proposed bridge alignment; and

2. After project completion, the area adjacent to the new bridge supports and the area previously impacted by the removal of the original bridge supports be revegetated with native coastal scrub vegetation.

This concludes formal consultation on the proposed bridge and road construction project. As required by 50 CFR 402.16, consultation is required if the amount or extent of incidental take is met or exceeded, if new information reveals effects of the proposed action that may affect the Smith's blue butterfly or American peregrine falcon in a manner or to an extent not considered in this opinion, if the project is substantially modified in a manner that causes an effect to listed species that was not considered in this opinion, and/or if a new species is listed or critical habitat designated that may be affected by this action.

We appreciate the cooperation of the Federal Highways Administration and Caltrans throughout this consultation process. Please contact Mr. Dennis Carlson of my staff at (805) 644-1766 should you require additional information regarding this Biological Opinion or the project.

Sincerely,

Brooks Harper

for Jeffrey D. Opdycke
Southern California
Field Supervisor

cc:
Larry Eng, CDFG, Sacramento, CA
Richard Hill, FWE, Portland, OR
Jack Fancher, FWE, Laguna Niguel, CA
Dennis Carlson, FWE, Ventura, CA

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APPENDIX E

CALTRANS AGREEMENT FOR

HIGHWAY 1 REVEGETATION AND MAINTENANCE

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY

DEPARTMENT OF TRANSPORTATION
P.O. BOX 8114
SAN LUIS OBISPO, CA 93403-8114
TELEPHONE: (805) 549-3111
TDD (805) 549-3259

January 23, 1992

Mr. Kelly Morgan
Planning Director
City of Sand City
1 Sylvan Park
Sand City, CA 93955

Dear Mr. Morgan:

The State Department of Transportation (Caltrans District 5) proposes to provide a median barrier on Highway 1 from Post Mile R82.6 to R85.1, immediately north of the City of Sand City. Funding for the proposed median barrier project was included in the 1990 Highway System Operations and Protection Plan (HSOPP) and is in the proposed 1992 HSOPP. Environmental Clearance for the proposed median barrier project was obtained on October 22, 1991, and included measures to mitigate impacts to existing vegetation within the highway median (see attached). Caltrans anticipates advertising for construction in January, 1993.

The proposed Environmental Enhancement and Mitigation Grant (EEM) application is the culmination of several years of consultation and coordination between the Caltrans District 5, the City of Sand City, and various resource agencies. Caltrans District 5 supports the proposed EEM project for the following reasons:

1) The proposed EEM project will not affect future improvements to Highway 1 in the project area.

2) The proposed EEM project has the potential to reduce Caltrans' long-term maintenance activities in the project area by replacing existing ice plant with drought tolerant native dune species.

Caltrans District 5 has agreed to participate in post-construction maintenance, supplemental watering if necessary, and long-term maintenance of the proposed revegetation site.

Sincerely,

G. K. Laumer
Deputy District Director
Planning and Programming

APPENDIX F

CALIFORNIA NATIVE PLANT SOCIETY

MITIGATION GUIDELINES

FEBRUARY 1991

SUGGESTED MITIGATION GUIDELINES

from

The California Native Plant Society

The Native Plant Society document "Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants" (February 1991) is included as an Appendix to the Sand City HCP to provide information on some of the stronger mitigation policies involved with habitat preservation. The Native Plant Society doses not have the legal authority to imposed these mitigation guidelines, however, some of the regulatory agencies do supplement their own policies with these guidelines in developing habitat conservation efforts. A negotiated settlement with U. S. Fish and Wildlife Service and the California Department of Fish and Game on the exact program and implementation elements of the Sand City HCP may use some elements of these guidelines.

MITIGATION GUIDELINES

REGARDING IMPACTS TO RARE, THREATENED, AND ENDANGERED PLANTS

by

CALIFORNIA NATIVE PLANT SOCIETY
RARE PLANT SCIENTIFIC ADVISORY COMMITTEE

February 1991

This document is intended to guide in the assessment and mitigation of impacts to rare and endangered plants. It supports the California Native Plant Society Policy Regarding Mitigation of Impacts to Rare and Endangered Plants (Appendix A). The goals of the policy are to prevent decline of rare plants and their habitats and to ensure that effective rare plant preservation measures are implemented.

In California the right to develop land is subject to regulation by public agencies that have discretionary control over project approval. The National Environmental Policy Act of 1969 (NEPA) and the California Environmental Quality Act of 1970 (CEQA) require project applicants to disclose, consider and avoid or reduce significant project impacts to rare or endangered species. Environmental documents required under those laws contain the project disclosures and evaluations and are available for public review.

EVALUATION GUIDELINES

Before identifying mitigation options for a project, the vegetation types, rare plants and habitats, and specialized biotic resource areas must be identified and the project impacts described and assessed. The Society recommends following the Department of Fish and Game's Guidelines for Assessing Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities (Appendix B). An important aspect of the evaluation is determining whether an impact is significant as defined by CEQA and NEPA. Under CEQA, for example, an significant impact is one which would produce a substantial, or potentially substantial, adverse change in the environment.

MITIGATION GUIDELINES

The Society endorses the mitigation concepts in the California Environmental Quality Act, Statutes and Guidelines (1986) because they may be applied specifically to rare plants. The types of mitigation for environmental impacts that are listed in CEQA (Section 15370) are:

(a) Avoiding the impact altogether by not taking a certain action.
(b) Minimizing impacts by limiting the degree or magnitude of the action.
(c) Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the project.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

These mitigation measures can be applied to a variety of environmental impacts but are not always appropriate to mitigating rare plant impacts. Mitigation measures should be developed on a site-specific basis in consultation with appropriate resources agencies. Under existing laws, a project applicant or a local lead agency may have the responsibility of consulting with public regulatory agencies on matters relating to project impacts on rare species.

For rare plants, effective mitigation options that can avoid or reduce impacts may be limited. The use of more than one measure may be necessary depending upon the type of project and the factors that make plant species rare (e.g., unusual soils, microclimates, or water regimes). Each project must be individually evaluated to determine which mitigation method or methods will avoid or reduce impacts defined by CEQA or NEPA as significant to a less than significant level. Because the life history and ecological information needed to judge whether mitigation measures are adequate is often lacking, additional biological research may be necessary prior to mitigation design and/or implementation in order to determine which measures will be most appropriate.

Of the five mitigation types in the California Environmental Quality Act, the California Native Plant Society fully supports those which avoid net reduction of population size or species viability. For most plant species this requires the protection of habitat essential to the survival of the species. In some instances, this also requires that impacts be fully avoided in order to prevent a significant impact (i.e., a net loss of plant numbers, habitat, or genetic variability essential to the future existence and recovery of the species). Alternatives such as site restoration and off-site introduction are generally unproven, and usually unsuccessful.

Avoidance:

Impacts to rare plants may be avoided by: (1) pre-project planning and design; (2) reconfiguring an existing project design; or (3) adopting the no-project alternative. Project planning and design measures to avoid impacts may include arrangement of facilities on-site to avoid sensitive features. Additional measures are almost always required to protect avoided sites from impacts associated with construction and operation of the project. Such protection can include, but is not limited to, fencing, open space or conservation easements, and transfer of development rights. See Appendix C for a brief discussion of conservation easements.

Each of the other mitigation alternatives included in the CEQA guidelines involves the acceptance of a net loss and/or use of transplantation, artificial propagation, seed transfer, or habitat restoration. The Society believes that these methods do not fully mitigate for significant impacts to rare plants and their habitats for three reasons:

(1) These alternatives compromise and ultimately negate mitigation by allowing net losses of rare plant populations and habitat. Mitigation must, according to CEQA, fully offset or reduce significant impacts to a less than significant level.

(2) Most rare plants are restricted to their known locations because they have specialized, poorly understood, habitat requirements. Creating the exact environmental conditions that these plants require may not be possible.

(3) The Society does not endorse alteration of naturally occurring plant communities through transplantation because the methodology for most rare plants is untested and therefore unreliable and because most past attempts have ultimately failed.

Although the Society does not endorse significant net losses of rare plant numbers or habitat, we recognize that where such losses are allowed or are deemed unavoidable, off-site restoration, compensation, transplantation or other salvage methods should be attempted to enhance degraded populations or provide for partial survival of the sacrificed population. Such measures also provide additional knowledge of the species' horticultural and ecological requirements. Such measures should never be performed so that an otherwise unaffected population is in any way jeopardized, for example by genetic contamination.

Mitigation alternatives other than avoidance are discussed below. These should be used alone or in combination to reduce impacts to less than significant levels. They should also be used in conjunction with monitoring and long-term management agreements.

Reducing Impacts:

The significance of impacts may be minimized by reducing the size of the project (i.e., partial avoidance) and by locating the project in the least environmentally sensitive area. Areas where impacts are avoided should be surrounded by buffer zones where impacts are absorbed, and set aside and permanently protected in conservation or open space easements. Efforts should be made to salvage portions of the population that will be lost.

Restoration:

Restoration can be used to mitigate impacts from projects approved prior to environmental regulations, or impacts allowed through a "statement of overriding considerations."

Depending upon the degree of impact, habitat restoration may be as simple as removing debris and controlling public access. In more complex situations, however, partial or total restoration of degraded habitat may require extensive revegetation, and soil protection and stabilization programs. Restoration must be tailored to the specific project site based on the habitat and species involved. General guidelines for restoration projects involving rare plants are discussed in Appendix D.

Reduction Over Time:

Impacts may be significantly reduced or eliminated by controlling public access and by fencing or staking the habitat area to prevent accidental intrusion into the site. Monitoring rare plants and habitats during all phases of a project will help ensure that construction and operation activities do not encroach on protected habitat.

When project actions have ended, restraints may or may not be removed depending on the completed project's potential for long-term impacts on the sensitive area. In most instances, control of public access to sensitive habitat sites needs to be continued beyond the construction phase of an individual project, especially in moderate and high density development areas. Public education about the value of the protected resources should also be considered for these areas.

Attempts to reduce or eliminate impacts over the life of the project should be required for all projects if the potential exists for secondary impacts due to human access; mitigation agreements that require placement of a conservation or open space easement on the mitigation site should be considered to implement this measure.

Off-site Compensation:

Compensating for the impact by protecting substitute resources or environments has been used in some instances to mitigate unavoidable impacts. In most instances off-site compensation does not fully reduce impacts to an insignificant level because a net loss of individuals or habitat that supports a natural self-sustaining rare plant population results. In spite of this, off-site compensation is a useful tool under specific circumstances where other mitigation alternatives cannot be applied or do not fully mitigate significant impacts.

Off-site compensation has been approached in several different ways, including: 1) permanent protection of an existing off-site native population; 2) permanent protection of an off-site introduced population; 3) a combination of 1) and 2); or 4) mitigation banking.

Determining habitat value for off-site compensation is difficult. The size of the acquisition will vary depending upon the type, condition, extent and rarity of the habitat and species. In any case, the acquisition and

permanent protection of an alternative parcel does not alter the fact that the loss of the initial site brings the rare habitat and species one step closer to ultimate extinction. Species preservation is greatly enhanced when plants are protected at a number of separate sites. Although the permanent protection of a vigorous, self-sustaining population of the species tends to reduce the endangerment potential of the species at that particular site, it does not necessarily fully compensate for the loss of the habitat known to support a viable population. To further reduce the endangerment potential for the species and habitat, the ratio of acquisition to loss must in most cases exceed 1:1 for any species. The ratio should be higher for rarer species, particularly for those that occupy irreplaceable habitats. In addition, enhancing off-site compensation areas (e.g., reducing grazing or OHV impacts) can help to more fully compensate for the net loss of plants at a project site.

If transfer of the threatened population is being attempted, an ecological study of the site, including an inventory of rare species, is needed to identify the feasibility of introduction. Genetic contamination can occur by mixing of populations of the rare plants and needs to be avoided, as does hybridization between the rare plant and close relatives that could occur at the introduction site. In no case are unthreatened populations to be jeopardized by the transfer of genetic material from the threatened site. If the compensation site is considered suitable, acquisition or other permanent protection efforts are required to ensure adequate long-term protection, and therefore to mitigate for a net loss of rare plants or habitat. A propagation program should be developed for the salvage and transfer of rare plant populations from the initial parcel before initiating any activities. Permits may be required from California Department of Fish and Game (DFG) or the U.S. Fish and Wildlife Service. Propagation methods for the salvaged population must be developed on a case-specific basis. The propagation program schedule must provide adequate lead time to plan and carry out transfer at the correct time of the year. In order to serve as mitigation, the transfer must be successfully completed before the project's construction activities eliminate plants or habitats. Maintenance and monitoring programs which include the collection of data to document degree of success should also be developed for the compensation site to ensure the transplanted population is self-sufficient and thereby demonstrate success.

MITIGATION IMPLEMENTATION

The mitigation design, implementation techniques and reporting procedures must be clearly documented. Responsibilities of the landowner/applicant, contractors, and agencies, and criteria that define successful mitigation, should be placed in writing to prevent later confusion or disagreement. The DFG Endangered Plant Program has recently prepared a mitigation plan annotated outline that includes the basic information needed to develop a mitigation plan for State-listed plant species that would be acceptable to the DFG. This document discusses important considerations in designing appropriate mitigation and monitoring plans and establishing appropriate performance criteria, and should be consulted when developing mitigation for impacts to any rare plant species.

Mitigation agreements entered into as a condition of a discretionary permit must contain assurances of implementation, monitoring and maintenance. Permits for development generally require a mitigation plan prior to approval. Project construction is sometimes completed before mitigation is fully implemented, especially where restoration or revegetation is involved. In these and related instances mitigation commitments should be guaranteed by a negotiable performance security. The amount of the negotiable security should be large enough to complete the mitigation and to purchase other rare plant habitat in the event the applicant fails to successfully complete the work in accordance with the approved mitigation agreement.

Clear criteria should be included in the mitigation agreement to define the conditions under which the mitigation measures are to be considered complete or successful, so that the performance security may be returned. Any mitigation effort requiring manipulation of plants or of habitats should be monitored for success or failure for a minimum of five years before relinquishing the performance security. The duration of the evaluation period must be based on the biological constraints of the species involved.

MAINTENANCE AND MONITORING IMPLEMENTATION

Maintenance and monitoring of rare plant populations and habitats are essential even where these are "protected" by mitigation measures. Monitoring enables project applicants and regulatory agencies to document compliance with mitigation agreements. Monitoring also enables scientists to gather valuable knowledge on the effectiveness of rare plant mitigation methods. The financial responsibility for monitoring and maintenance of rare plant populations and habitat is typically that of the project applicant. In all cases, monitoring should be conducted by an experienced botanist. Maintenance responsibilities must be clearly stated in contractual agreements to eliminate any confusion during future maintenance and monitoring.

Maintenance must consider the ecological needs of the species and habitat and the types of mitigation used. Where undisturbed habitat is set aside, maintenance may consist of little more than controlling public access, maintaining fences, or periodic weed removal. Restoration and revegetation programs may require more complex maintenance programs. For example, invasive non-native plants may require specialized control measures to keep them from spreading; herbivores may also need to be controlled to protect the native vegetation.

Monitoring programs must be developed to meet the needs of the specific mitigation program. For example, it may be necessary to monitor the progress of construction activities, if these activities have the potential to damage rare plant habitat. Monitoring of restoration and revegetation projects is essential to document success or failure and identify areas where additional work is needed. Monitoring undisturbed sites that have been set aside and are not likely to suffer direct or cumulative impacts may require only periodic visits to determine if easement violations have occurred. Requirements to correct violations should be described in the conservation easement or mitigation agreement.

In the past, mitigation for many approved projects was not properly implemented and agencies failed to enforce compliance by project developers. To rectify this, legislation passed in 1989 (AB 3180, Cortese) amended CEQA by adding section 21081.6 to allow California agencies to require monitoring of mitigation measures that were defined for a given project. The features to be monitored must be outlined in a formal monitoring plan which must be sufficient to identify failures in mitigation throughout the life of the project, not just during the construction phase. Agencies can enforce compliance with monitoring plans through several means, including specifying penalties for failure to meet monitoring obligations, through the use of existing police power such as fines or restraining orders, and/or by requiring a performance security of the project applicant.

Monitoring a conservation easement is the responsibility of the easement holder, whether this is a nonprofit organization or a public agency. The easement holder is also responsible for seeking redress for violations of the conservation easement contract.

CONCLUSION

The Society supports project alternatives that completely avoid significant project impacts to rare and endangered plant species and their habitats. In cases where other mitigation alternatives are approved, mitigation plans should be designed based on the specific requirements of the species and habitat involved. Although the current limited understanding of the ecological requirements for most rare species makes this task difficult, the use of preliminary ecological studies in mitigation planning will help to develop successful mitigation programs. Emphasis must be placed on conserving not only the rare plant but its habitat. The increased awareness of the need for solutions to problems of human impact on the environment and endangered species is encouraging. This awareness and concern has led to the participation of many agencies, conservation organizations, and concerned individuals in an effort to develop the criteria needed for rare plant protection. The California Native Plant Society has dedicated itself to helping realize this goal, and is always available to assist private individuals, local

governments, public agencies and others in designing truly effective mitigation measures. Some of the references cited in the bibliography contain information relating to studies of specific rare plants and mitigation implementations for specific development projects.

ACKNOWLEDGEMENTS

The CNPS Mitigation Policy and Guidelines were produced through the dedicated effort of many individuals. Special thanks go to Betty Guggolz for her lead role in the production of this document and her patient endurance of innumerable modifications to the text. Others who contributed valuable advice, criticism and support were: Ken Berg, Roxanne Bittman, Fredrica Bowcutt, Susan Cochrane, Charlice Danielsen, Phyllis Faber, Jack Guggolz, James Jokerst, Tim Messick, Mary Meyer, James Nelson, Thomas Oberbauer, David Schonum, Teresa Sholars, Mark Skinner, James Payne Smith, Joan Vilms, Laurie Wickenheiser, and Vernal Yadon.

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APPENDIX A

CALIFORNIA NATIVE PLANT SOCIETY

POLICY REGARDING MITIGATION OF IMPACTS TO RARE AND ENDANGERED PLANTS

The policy of the California Native Plant Society is that all potential direct, indirect, and cumulative impacts to rare, threatened, or endangered plants and their habitats must be assessed and that appropriate measures be implemented to prevent such impacts resulting from projects. The policy of the Society is also that environmental documents and mitigation plans be based on complete, accurate and current scientific information. Viability of rare, threatened, or endangered plants and their habitats takes precedence over economic or political expediency. Because of the tremendous diversity of rare plant habitats in California, and the dependence of rare plants on their local habitats, it is imperative that mitigation measures be developed on a site specific basis. Local environmental conditions, species biology, land use patterns and other factors must be incorporated into the design of mitigation plans.

The goals of this policy are to prevent the decline of rare plants and their habitats and to ensure that effective rare plant preservation measures are implemented.

Of the mitigation measures listed in the California Environmental Quality Act, the Society fully endorses only that of avoiding the impact. Measures to minimize, to rectify, or to reduce or eliminate the impact over time are recognized by the Society as partial mitigation. The Society does not recognize off-site compensation as mitigation.

Guidelines for project review and evaluation of mitigation proposals are available from the California Native Plant Society. The Rare Plant Scientific Advisory Committee will revise the guidelines periodically so that they are easily used with the California Environmental Quality Act and other current legislation.

Adopted by the CNPS Board of Directors: June 6, 1987

APPENDIX B

THE RESOURCES AGENCY
Department of Fish and Game
May 4, 1984

GUIDELINES FOR ASSESSING EFFECTS OF PROPOSED DEVELOPMENTS ON RARE AND ENDANGERED PLANTS AND PLANT COMMUNITIES

The following recommendations are intended to help those who prepare and review environmental documents determine when a botanical survey is needed, who should be considered qualified to conduct such surveys, how field surveys should be conducted, and what information should be contained in the survey report.

1. Botanical surveys that are conducted to determine the environmental effects of a proposed development should be directed to all rare and endangered plants and plant communities. Rare and endangered plants are not necessarily limited to those species which have been "listed" by state and federal agencies but should include any species that, based on all available data, can be shown to be rare and/or endangered under the following definitions.

   A species, subspecies or variety of plant is "endangered" when the prospects of its survival and reproduction are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, over-exploitation, predation, competition or disease. A plant is "rare" when, although not presently threatened with extinction, the species, subspecies or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens.

   Rare plant communities are those communities that are of highly limited distribution. These communities may or may not contain rare or endangered species. The most current version of the California Natural Diversity Data Base's Outline of Terrestrial Communities in California may be used as a guide to the names of communities.

2. It is appropriate to conduct a botanical field survey to determine if, or the extent that, rare plants will be affected by a proposed project when:

   a. Based on an initial biological assessment, it appears that the project may damage potential rare plant habitat;

   b. Rare plants have historically been identified on the project site, but adequate information for impact assessment is lacking; or

   c. No initial biological assessment has been conducted and it is unknown whether or not rare plants or their habitat exists on the site.

3. Botanical consultants should be selected on the basis of possession of the following qualifications (in order of importance):

   a. Experience as a botanical field investigator with experience in field sampling design and field methods;

b. Taxonomic experience and a knowledge of plant ecology;

c. Familiarity with the plants of the area, including rare species; and

d. Familiarity with the appropriate state and federal statutes related to rare plants and plant collecting.

4. Field surveys should be conducted in a manner that will locate any rare or endangered species that may be present. Specifically, rare or endangered plant surveys should be:

a. Conducted at the proper time of year when rare or endangered species are both "evident" and identifiable. Field surveys should be scheduled (1) to coincide with known flowering periods, and/or (2) during periods of phenological development that are necessary to identify the plant species of concern.

b. Floristic in nature. "Predictive surveys" (which predict the occurrence of rare species based on the occurrence of habitat or other physical features rather than actual field inspection) should be reserved for ecological studies, not for impact assessment. Every species noted in the field should be identified to the extent necessary to determine whether it is rare or endangered.

c. Conducted in a manner that is consistent with conservation ethics. Collections of rare or suspected rare species (voucher specimens) should be made only when such actions would not jeopardize the continued existence of the population and in accordance with applicable state and federal permit regulations. Voucher specimens should be deposited at recognized public herbaria for future reference. Photography should be used to document plant identification and habitat whenever possible, but especially when the population cannot withstand collection of voucher specimens.

d. Conducted using systematic field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas.

e. Well documented. When a rare or endangered plant (or rare plant community) is located, a California Native Species (or Community) Field Survey Form or equivalent written form should be completed and submitted to the Natural Diversity Data Base.

5. Reports of botanical field surveys should be included in or with environmental assessments, negative declarations, EIRs and EISs, and should contain the following information:

a. Project description, including a detailed map of the project location and study area.

b. A written description of biological setting referencing the community nomenclature used, and a vegetation map.

c. Detailed description of survey methodology.

d. Dates of field surveys.

e. Results of survey (including detailed maps).

f. An assessment of potential impacts.

g. Discussion of the importance of rare plant populations with consideration of nearby populations and total species distribution.

h. Recommended mitigation measures to reduce or avoid impacts.

i. List of all species identified.

j. Copies of all California Native Species Field Survey Forms or Natural Community Field Survey Forms.

k. Name of field investigator(s).

l. References cited, persons contacted, herbaria visited, and disposition of voucher specimens.

APPENDIX C

CONSERVATION EASEMENTS

Open Space or Conservation Easements have been used in a number of jurisdictions throughout California. In open space or conservation easements the landowner transfers the rights to develop a parcel to a conservation organization or public agency. The legal basis for this action is found in Government Code Section 51050 et seq., particularly Section 51083.5 which describes the granting of easements to nonprofit organizations. Easements granted to an impartial third party, interested organization, or resource agency are the only secure types. Those granted to a local public jurisdiction can be eliminated or modified with a majority vote.

Determining the appropriate size of an easement is difficult. It must be large enough to support, in perpetuity, a biologically secure, reproducing population with an adequate buffer zone. The proposed land use surrounding the easement and current and future land uses of the conservation or open space easement area must also be taken into consideration. A land use or management plan that accounts for the type of rare plant habitat and the biology of the resident species needs to be developed for easement areas. The design of the protection area boundaries and management plan must be scientifically based, utilizing baseline studies and species biology information.

Conservation and open space easement contracts should include a legal description of the easement parcel, the purpose of the easement and describe the specific resources or conditions being protected by the easement. The contract should also include the rights of the grantee, the grantors rights and uses, restrictions of undesirable activities, and a general restriction of all uses inconsistent with the purposes of the easement. Language should be included that states that the conditions of the easement contract are binding not only on the grantor, but also on his heirs, assigns, and all other successors and interests so that the term of the easement runs with the land in perpetuity.

Conservation easement contracts should also include: (1) specific restrictions to protect the site from land use change, introduction of nonnative plant species and public access; and (2) the right of the grantee to enforce compliance with the terms of the easement and to require restoration of the habitat at the grantor's expense should damage to the habitat result from violation of the agreement by the grantor.

Maintenance and monitoring agreements and guideline documents for the conservation easement should be incorporated into the easement contract.

APPENDIX D

BRIEF GUIDELINES FOR RESTORATION PROJECTS

General guidelines for restoration projects are as follows:

1. Prior to the development of a restoration program, the goals of the completed project must be established and a course of action developed to achieve that goal.

2. Pre-impact site conditions should be determined. Clues to this may be found in remnants of the existing habitat, in herbarium research, and from botanists who have collected in the area in the past. Local historical files or societies may be a source of information if the site is near an urban area.

3. Other site factors which may require study are land contours, soil types, erosion control, topsoil protection, and pre-impact hydrologic patterns.

4. An ecological study of the species being considered for reintroduction is necessary, including their total distribution, other habitat sites, associated species and pollinators.

5. Revegetation methodology research may include propagation techniques, material sources, propagule collection and preparation, planting densities, seedling protection, weed and invasive exotics control, site protection, public access and many other factors. The present knowledge of propagation requirements for rare plants is so limited that all efforts to propagate and reintroduce them in the wild should be carried out under the direct supervision of a specialist well versed in the cultural requirements of the genus.

6. A maintenance and monitoring program should also be included in the development of restoration/revegetation plans, and should utilize consistently documented data to further augment the existing knowledge of the species and to develop criteria for other revegetation projects.

APPENDIX E

DEFINITIONS

The following definitions are used in this document:

Maintenance: the process of ensuring that rare plants and their habitats remain viable and in good condition.

Mitigation: actions taken to avoid or reduce significant adverse impacts. Impacts are less than significant if no net loss of population size or habitat quality results.

Mitigation banking: A large preserve or open space which individual developers buy into at a predetermined compensation ratio to satisfy their mitigation debt. Mitigation banking focuses mitigation efforts into significant amounts of habitat rather than permitting establishment of many smaller and less significant or less defensible preserves or open space areas.

Monitoring: periodic assessment of the status of a plant population or habitat to determine its condition and reveal trends in vigor and viability; should be conducted in a scientific and standardized fashion.

Off-site Compensation: preservation in perpetuity of alternate sites containing similar habitat types and species to offset or "compensate" for unavoidable losses. The ratio of acquisition to loss should be greater than one to one for any species. In lieu of this, an equitable sum of money may be paid for the purchase of an alternate site.

Preservation: the maintenance and protection of rare plants and habitats at levels that existed prior to the commencement of a project.

Rare Species: for the purpose of this policy, and to avoid undue repetition, the word "rare" is used to include "rare", "threatened", and "endangered" plant species as defined in Section 3(4)(15) of The Federal Endangered Species Act of 1973, and The California Environmental Quality Act Guidelines, Section 15380 (1986). The latter section is reproduced below:

> (b) A species of plant is:
> (1) "Endangered" when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or
> (2) "Rare" when either:
> (A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or
> (B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered "threatened" as that term is used in the Federal Endangered Species Act.
> (c) A species of plant shall be presumed to be rare or endangered if it is listed in:
> (1) Sections 670.2 or 670.5, Title 14, California Administrative Code; or
> (2) Title 50, Code of Federal Regulations, Section 17.11 or 17.12 pursuant to the Federal Endangered Species Act as threatened or endangered; or
> (d) A species not included in any listing identified in subsection (c) shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria in subsection (b).

Division 2, Chapter 1.5 of the California Fish and Game Code (California Endangered Species Act Section 2067) defines a "threatened" species as a native species or subspecies of a plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts required in this chapter.

Transfer of Development Rights (TDR): Under this process, an applicant may gain density bonuses in designated development areas if rare plant populations and habitat are left in permanent open space. This alternative also requires an organized plan by a local agency identifying those areas to be left undisturbed and those that may be used by the applicant for density increases in return for protecting the areas to be left undisturbed. Protection in perpetuity is a necessary requirement of TDR proposals that are implemented to protect rare plant populations. TDR is being used increasingly as a mitigation tool for on-site rare plant protection.

Unavoidable significant impacts: impacts resulting from a "statement of overriding considerations" where the public benefits of a project have been determined to outweigh the significance of the environmental impact, or where an emergency situation or natural disaster may destroy, or has destroyed rare plant habitat and species.

APPENDIX F

CNPS RARE PLANT LISTS (Smith and Berg 1988)

The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California, lists over 1500 plants that CNPS considers to be endangered, rare, of limited distribution, extinct, or insufficiently known in California. The Inventory is periodically revised and updated.

Lists 1A and 1B: List 1A (Plants Presumed Extinct in California) and List 1B (Plants Rare, Threatened, or Endangered in California) contain many state and federally listed taxa, and also many taxa which are not state or federally listed but which qualify as rare or endangered under the California Environmental Quality Act (Section 15380 (d)).

List 2: Plants that are Rare or Endangered in California but More Common Elsewhere. Although List 2 plants are not eligible for consideration under the Federal Endangered Species Act, they should be considered for state listing and receive consideration when the California Environmental Quality Act is applied.

List 3: Plants About Which We Need more Information. List 3 includes species for which CNPS has inadequate knowledge of abundance, distribution, or rarity. List 3 species do not qualify for protection at this time, but should be considered at the time of project environmental impact evaluation. List 3 species found on a project site should be studied to determine if they qualify for consideration under Section 15380 (d) of the California Environmental Quality Act.

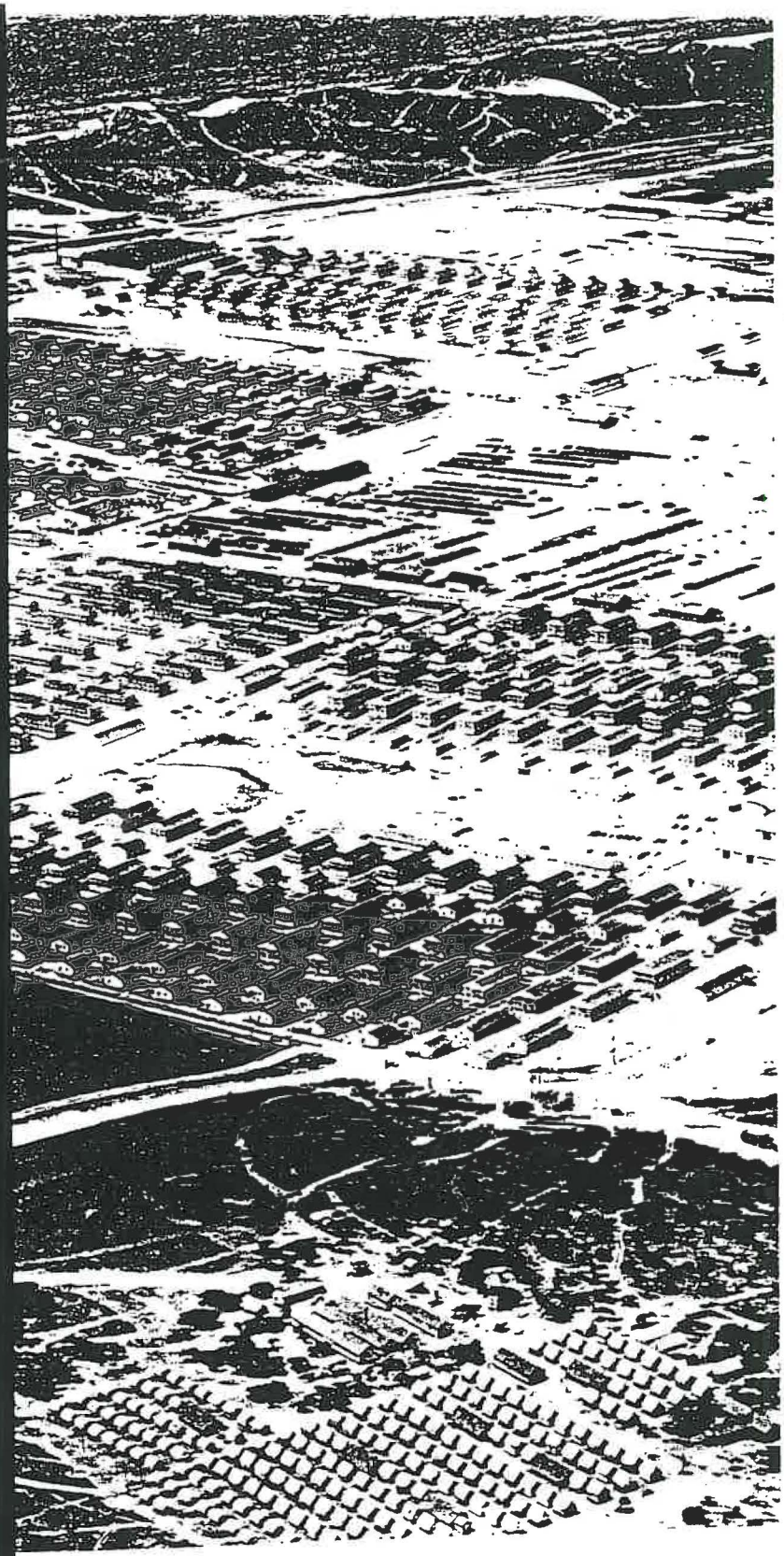
List 4: Plants of Limited Distribution. List 4 plants have limited distribution but their vulnerability or susceptibility to threat appears to be low at this time. Although not endangered at this time, they are uncommon enough that their status is monitored. List 4 species require review in environmental impact assessments under the California Environmental Quality Act. List 4 species found on a project site should be studied to determine if their rarity merits consideration under this law. Mitigation should always be considered for List 4 species to prevent them from becoming so rare that state or federal listing as threatened or endangered is required.

APPENDIX G

FORT ORD REUSE PLAN:

"HABITAT MITIGATION PROGRAM"

PRELIMINARY DRAFT



Preliminary Draft

Initial Base Reuse Plan

Cooperative Planning For
Fort Ord By

Marina
Seaside
Del Rey Oaks
Monterey
Monterey County
Sand City

November 25, 1992

Fort Ord Reuse Group
(FORG)
445 Reservation Road
Suite E
Marina, California
93933
(408) 384-0605/424-1356

Habitat Mitigation Program

Many areas within Fort Ord are home to threatened, endangered and rare species. These plants and animals live in habitats that are also rare including maritime chaparral, vernal pools, wetlands, native grasslands and dwarf oak woodland forest. These species, along with slope, soils, geology and water present an array of constraints to the reuse and development of Fort Ord. While the IBRP dedicates major areas to Open Space and Parklands, additional effort must be expended in the form of a Habitat Mitigation Program to enable development and Economic Recovery to occur as depicted in the IBRP.

There are about 20,000 acres of undeveloped lands in the interior of Fort Ord. These areas have been used for military training since the 1920s. Since most of the military training has been by infantry units, much of the training area remains in a natural condition.

These areas have important biological values. The maritime chaparral habitat, which makes up 39 per cent of Fort Ord, has numerous rare botanical species, including one species that is only found on Fort Ord. Two other maritime chaparral species could become extinct if Fort Ord populations are not protected. The maritime chaparral community at Fort Ord is the best remaining example of this habitat type. Fort Ord interior lands also contain significant examples of two other rare habitat types, vernal pool/wetlands and native perennial grasslands, as well as excellent examples of native oak forests.

The development potential for most of the area east of Barloy Canyon Road is very limited due to steep slopes and unstable soils and underlying geology. Development in the impact area is dependent on completion of cleanup of explosive ordnance and resolution of Environmental issues.

It is becoming clear that as urbanization takes place along the coast of Monterey County, there is a need to consider the protection of rare and endangered species in a regional context. Many local jurisdictions in Monterey, such as the cities of Marina, Sand City, Seaside, Monterey and Monterey County are having to deal with endangered species issues on a case by case basis. The presence of the endangered Smith's blue butterfly along the Monterey Coast and inland Carmel area, the recent listing of dune gilia as an endangered species and the proposed listing of the Monterey spineflower, are constraints to development in these communities. Resolving these issues has become a long drawn out process for many communities.

In 1991, the Army hired Jones & Stokes Associates to prepare a Baseline Flora and Fauna Study of the Base as part of the disposition program. Although the study has not been officially released to the public, preliminary

findings indicate there are extensive areas of native habitat on the Base which support species of concern including the Smith's blue butterfly, dune gilia, Monterey spineflower and black legless lizard. See attached maps.

The Bureau of Land Management (BLM) has developed a strategy for the management of large amounts of undeveloped land under the management of BLM. FORG is in the process of organizing a Habitat Mitigation program in conjunction with the U.S. Army Corps of Engineers, BLM and U.S. Fish and Wildlife.

The best way to provide for the long-term protection of many of these species may not be to set aside large areas of existing habitat in each jurisdiction. This is a band-aid approach and may not be effective in providing long-term protection of the species. A combination of site specific conservation and regional conservation is key to a successful conservation program.

It is possible that some of the lands on Fort Ord which have high resource value could be designated as potential habitat preserves during the disposition process. These lands could be the central core of a habitat mitigation program. The idea being that funds generated by the private sector through the collection of mitigation fees could be used to

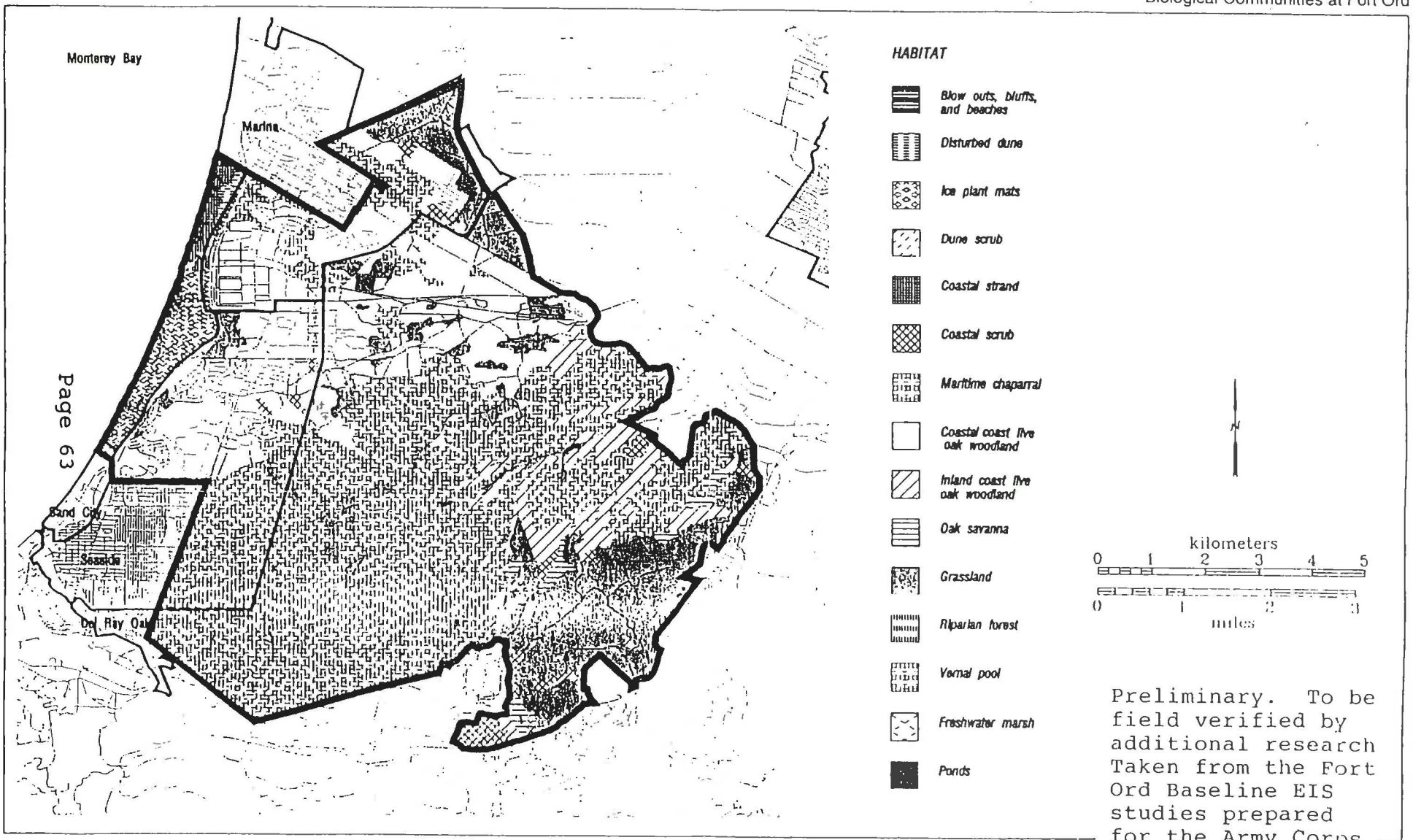
1) establish a core preserve at Fort Ord.

2) carry out specific enhancement programs on the preserve or

3) contribute to a long-term maintenance and protection program for the preserve.

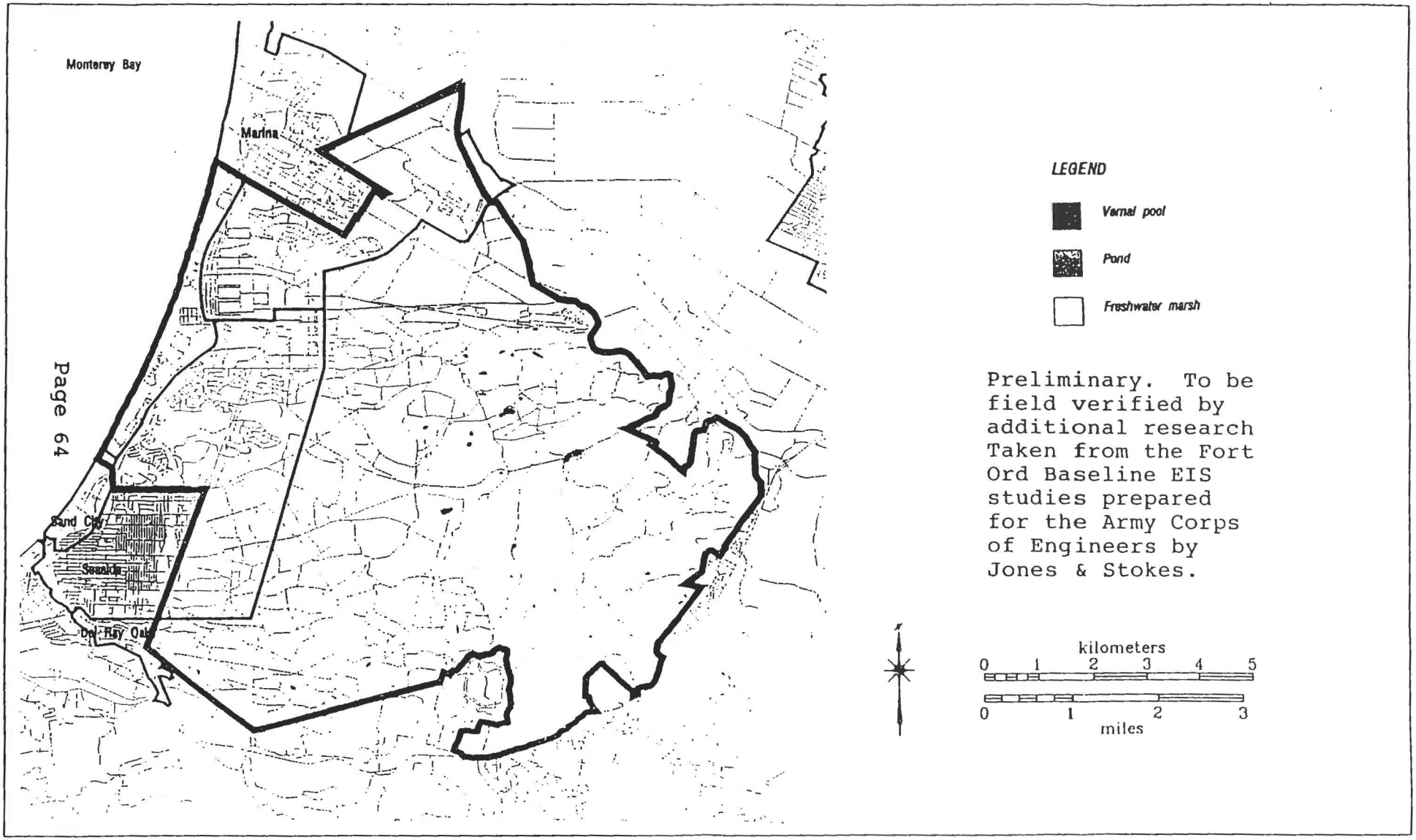
The existence of a habitat mitigation program may provide local jurisdictions, such as Marina, Seaside, Del Rey Oaks, Monterey, Monterey County and Sand City, the opportunity to mitigate impacts on endangered species.

Since mitigation includes compensating for an impact by providing permanent replacement resources or environments throughout the acquisition and reservation of land and the provision of adequate funding for perpetual conservation, protection or enhancement of species of concern, the habitat mitigation program can be an important way to mitigate the take of rare and endangered species to implement the IBRP.

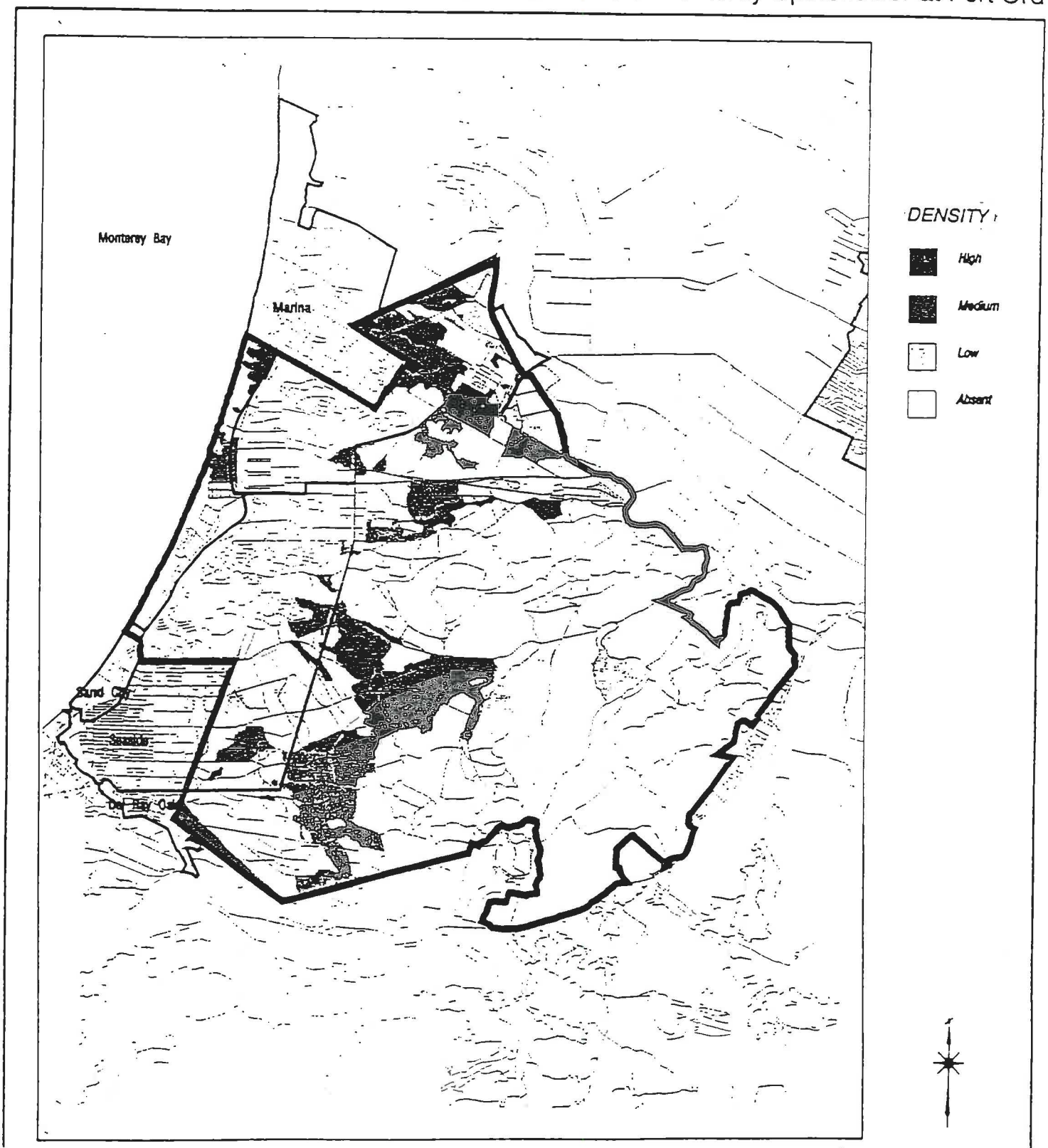


Preliminary. To be field verified by additional research Taken from the Fort Ord Baseline EIS studies prepared for the Army Corps of Engineers by Jones & Stokes.

Vernal Pools, Ponds, and Freshwater Marshes at Fort Ord



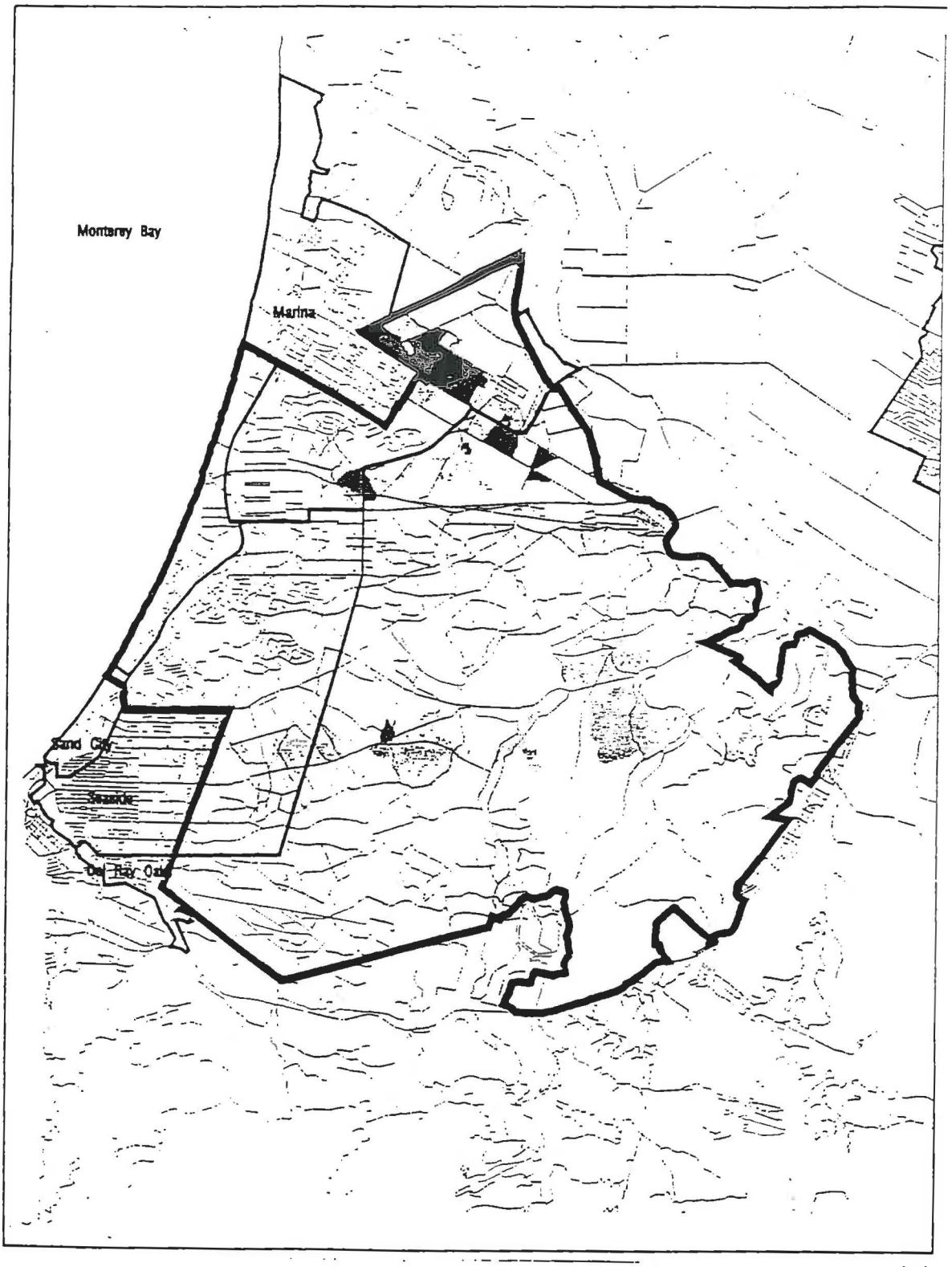
Distribution of the Monterey Spineflower at Fort Ord



Scale 1:100,000

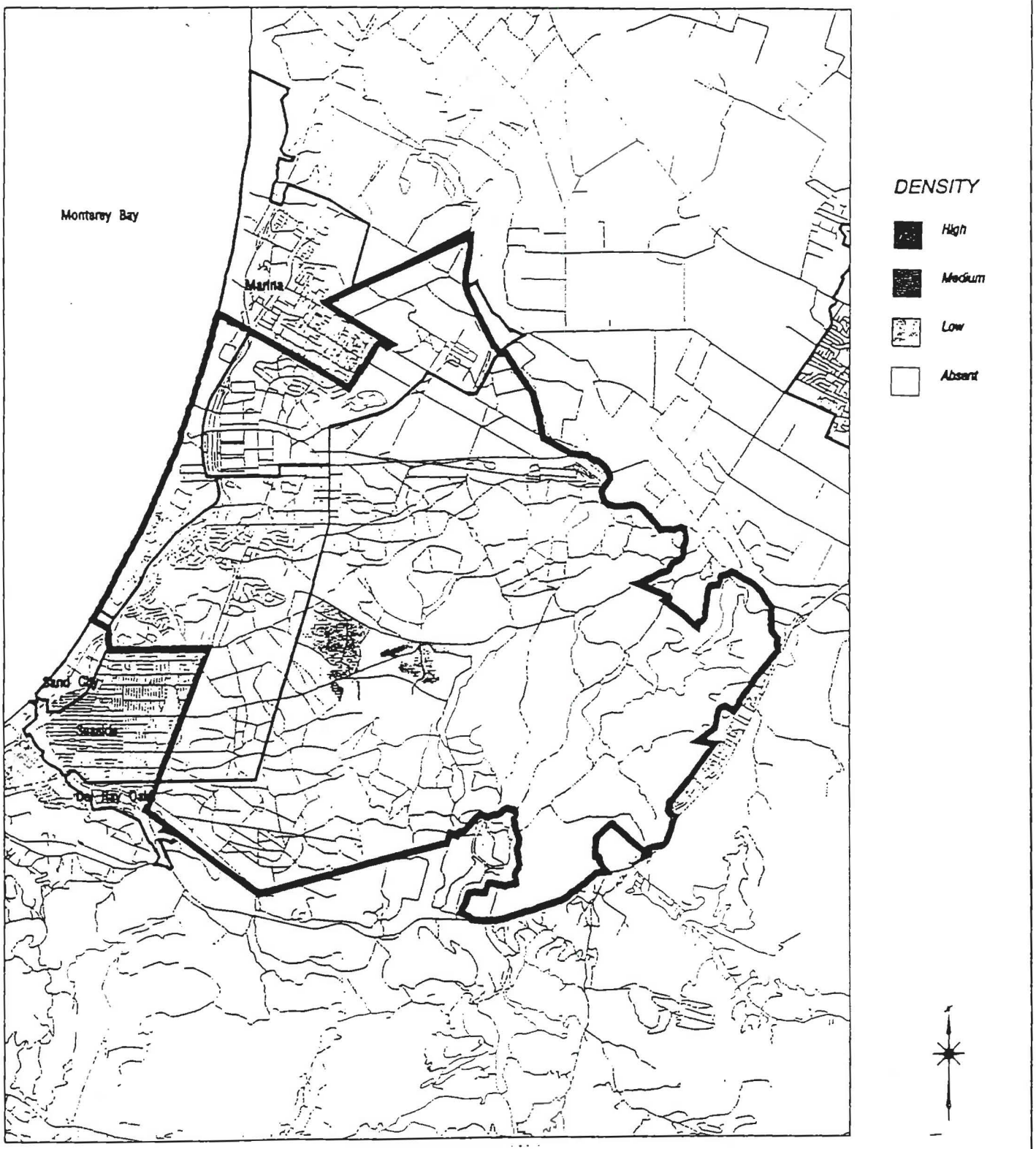
Preliminary. To be field verified by additional research Taken from the Fort Ord Baseline EIS studies prepared for the Army Corps of Engineers by Jones & Stokes.

Distribution of the Sand Gilia at Fort Ord

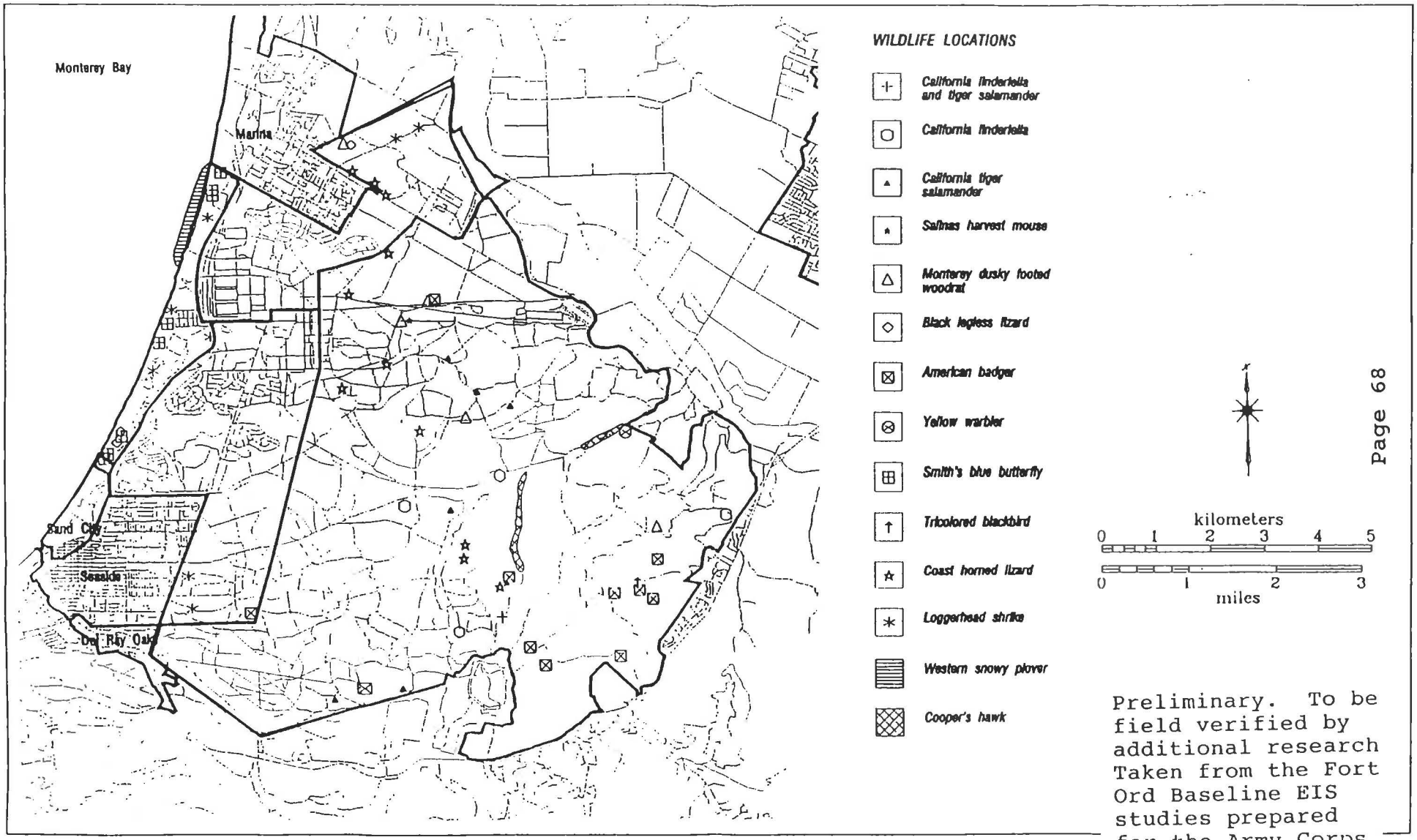


Preliminary. To be field verified by additional research Taken from the Fort Ord Baseline EIS studies prepared for the Army Corps of Engineers by Jones & Stokes.

Distribution of the Seaside Bird's-Beak at Fort Ord



Preliminary. To be field verified by additional research Taken from the Fort Ord Baseline EIS studies prepared for the Army Corps of Engineers by Jones & Stokes.



Preliminary. To be field verified by additional research Taken from the Fort Ord Baseline EIS studies prepared for the Army Corps of Engineers by Jones & Stokes.

FIGURE 2 -- PROPOSED HABITAT/LAND USE PLAN AND MAP

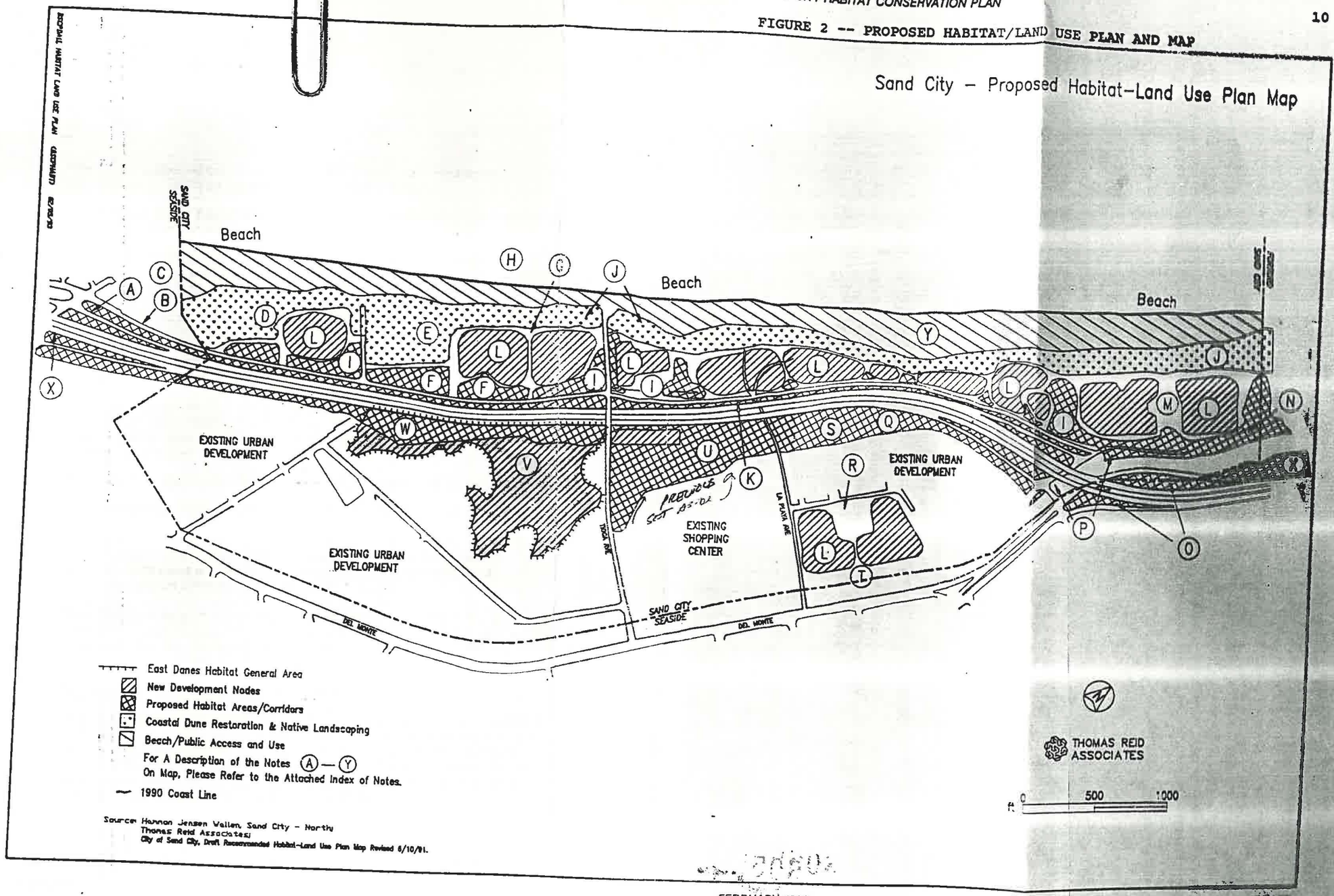
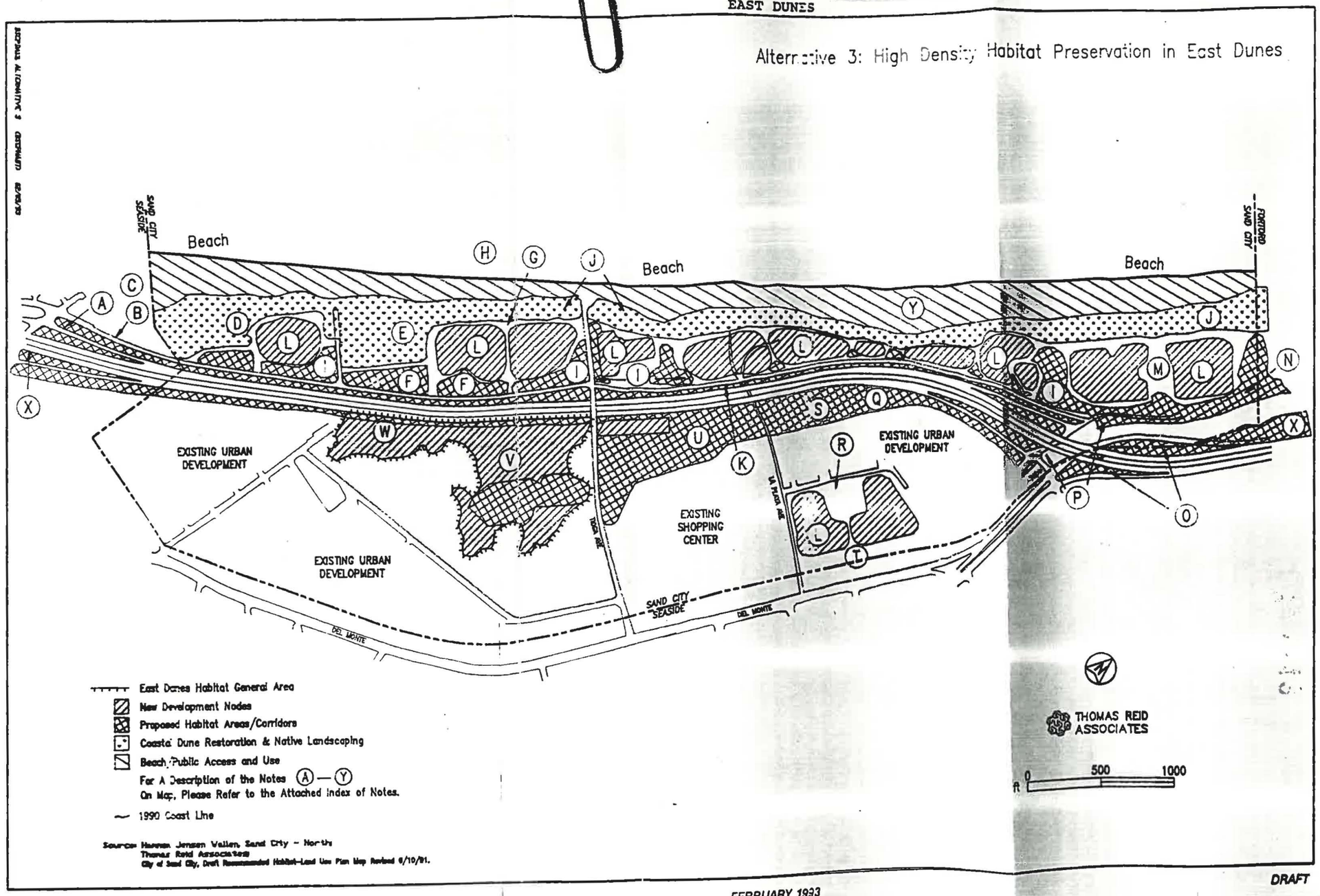


FIGURE 1[illegible] -- ALTERNATIVE 3: HIGH DENSITY HABITAT PRESERVATION IN EAST DUNES



DRAFT

FEBRUARY 1993

5.6 Impact Comparison of Proposed HCP and Alternatives

IMPACT COMPARISON OF PROPOSED PLAN AND ON-SITE ALTERNATIVES *					
	PROPOSED LAND USE PLAN	ALTERNATIVE 1 NO PROJECT	ALTERNATIVE 2 MAXIMUM CONSERVATION	ALTERNATIVE 3 HIGH DENSITY CONSERVATION OF EAST DUNES	ALTERNATIVE 4 PARTICIPATE IN REGIONAL PROGRAM
EXISTING HABITAT AREA	36 acres	36 acres	36 acres	36 acres	36 acres
HABITAT LOST High or Low Quality	High- 3.8 acres Low- 9.7	0 acres	High- 0 acres Low- 3 acres	High- 0 acres Low- 12.7 acres	High- 3.8 acres Low- 9.7
PERCENT HABITAT LOST	37%	0%	8%	36%	37%
ULTIMATE HABITAT PRESERVED AND/OR RESTORED	70 acres	uncertain	uncertain	70 acres	70+ acres
COMMENTS:	WOULD RESULT IN A BETTER DEVELOPMENT ENVELOPE IN EAST DUNES THAN HIGH DENSITY ALT.	WON'T RESOLVE ENDANGERED SPECIES CONFLICT; CONTINUED HABITAT DEGRADATION	OUTSIDE FUNDING NEEDED TO MAINTAIN HABITAT AND PURCHASE PRESERVES	HIGHER DENSITY HABITAT PRESERVED OVER PROPOSED PROJECT	COULD FINANCE ADDITIONAL MITIGATION AT FORT ORD HABITAT PRESERVE

* All figures approximate

CITY OF SAND CITY - CALIFORNIA
PLANNING DEPARTMENT
One Sylvan Park
Sand City, CA 93955
Phone (408) 394-6700
Fax (408) 394-2472

DAVID PENDERGRASS - MAYOR

TRANSMITTAL NOTICE

TO: Attached Distribution List
FROM: City Manager
DATE: February 26, 1993
SUBJECT: Transmittal of Draft Sand City Proposed Habitat Conservation Plan

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Enclosed for your review and comment is a copy of the Draft Sand City Proposed Habitat Conservation Plan (HCP). This document has resulted from a long, complicated and controversial planning program. Originally, the City established a Task Force Advisory Committee (TFAC) to provide input and guidance to the habitat planning process for Sand City. The original intent was that the TFAC would reach consensus on the basic proposals to be incorporated into the HCP. However, consensus has not been completely possible in this program because of conflicts between property owners' rights and the federal/state requirements to protect endangered species.

However, the City remained committed to produce a Draft HCP that would meet the basic requirements of a Habitat Conservation Program and enable the City to enter into negotiations with the state and federal regulatory agencies. It is still the City's goal to obtain development rights and provide a reasonable habitat conservation area in the City's east Dunes area.

If you have any questions or comments on the attached document, please contact Kelly Morgan, City Planner. A public meeting on this Draft HCP will be scheduled at the April 6, 1993 City Council meeting, 7:00 pm, at the Sand City Council chambers. If you have an interest in this HCP program, we urge you to attend that meeting.

DRAFT

SAND CITY COUNCIL

Sand City is on the cutting edge of new housing the relatively undeveloped and highly visable area of the EAST DUNES RESIDENTIAL area and what we say there will attract or detract future citizens, neighbors as well as business to this community.
For this reason we have a need for a UNIFORM BUILDING ~~CODE~~ STANDARD which we all can live with.

The lack of a UNIFORM BUILDING ~~CODE~~ STANDARD will continue to cause a problem for each new applicant for a permit. To take each applicant on a case by case basis creates animosity and costly delays and frustration.

Currently the small size of the lots in Sand City are based on outdated standards and may encourage builders to mass structure to comply with the need for living space and the accompanying parking. This can only result in substandard dwellings and crowded housing.

We and the undersigned propose that you accept our committees services to the council as an aadvisory committee to aid in the planning for future city developement,with the developement and planning for the EAST DUNES RESIDENTIAL AREA our priority.

We propose to accomplish the following:

- to the maximum extent feasible, development standards which would protect the visual quality in ALL developement areas of the city.

To dovelope a GENERAL PLAN which WE (the landowners) can live with and still maximize our values without compromising responsible developement.

Expidite the approval and developement of existing plans with our eye to the needs for specific guidelines with the following as a basis for discussion:

Re-evaluate new and mixed land use
Prevent overcrowding of lots with structures and paving
Develop Floor Plan Ratio
Establish new design regulations
Study the feasibility of lot mergers

305541

Members of this committee are:

Coralee Brolier
David Wilson
Suzanne Katzakian
Susan Collins
David Martin

This list is not meant to exclude anyone interested in serving on this committee.

Michael Morris signed draft
council

We in a affort to equitably repesent the needs of the community, its landowners and residences, have formed a committee and wish to be recognized by the Sand City Council as

(1) an advisory to the council
(2) council sanctioning
(3) an acknowledged committee
(4) committee members willing to serve

We as a committee (with the EAST DUNES RESIDENTIAL AREA) AS ITS PRIORITY, wish to:

Assist in possible zoning changes in the commercially zoned area of the city.

-Wish to act on the housing grant committee
-Plan for the developement of the East Dunes Residential Developement- with the East Dunes as our priority

We have formed this committee and offer our services to the council as an advisory committee to assist in the planning future city developement and housing.