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Draft
Feasibility Study

for the

Northern Segment of the MacKerricher Coastal Trail Project

prepared for:

CA Department of Parks and Recreation
Russian River/Mendocino District
P.O. Box 123
Duncan Mills, California 95430

contact:
Gary Shannon

CA Department of General Services
Real Estate Services Division
1102 Q Street, Suite 5100
Sacramento, California 95814

contact:
Robert Sleppy

prepared by:

EDAW, Inc.
2022 J Street
Sacramento, California 95814

Contact:
Curtis Alling, AICP

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EDAW

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1 EXECUTIVE SUMMARY

BACKGROUND

Sponsored by the California Department of Parks and Recreation (DPR), the MacKerricher Coastal Trail Project is proposed to reconstruct and repair a former logging road (the haul road) at MacKerricher State Park to provide a recreational trail for non-motorized use from the City of Fort Bragg to Highway 1 at Ten Mile River. The trail is intended to provide a safer route than Highway 1 for bicyclists, as part of the California Coastal Trail. The project also proposes structural repairs to the Pudding Creek Trestle and acquisition of private property to eliminate trespassing to gain park access near Ten Mile River. DPR is seeking funding for the project through the Federal Highway Administration's (FHWA) Intermodal Surface Transportation Efficiency Act (ISTEA) and the California Department of Transportation's Environmental Enhancement and Mitigation (EEM) program.

Over the last two decades, winter storms have seriously damaged or destroyed portions of the haul road at several locations between Lake Cleone and Ten Mile River. In 1983 a major washout permanently closed the haul road to vehicular traffic north of Ward Avenue. Additional erosion of the road has occurred since 1983. In total, over 4,000 linear feet of the haul road would need to be replaced to complete the proposed trail. In addition to new trail construction, the project would include repair and resurfacing a substantial amount of the remaining haul road.

The northernmost segment of the proposed project includes development of a trail though the Inglenook Fen-Ten Mile Dune Natural Preserve (Preserve). This section of the proposed route, beginning at Ward Avenue and ending at Ten Mile River, supports one of the largest native dune complexes in California (Pasquinelli 1998). The Preserve also includes a variety of other terrestrial, wetland, and freshwater habitats. Inglenook Fen, which is located near the middle of the Preserve, is the only remaining coastal fen in California (DPR 1995). The diverse and biologically significant habitats in the Preserve support numerous special-status plant and wildlife species. Significant archaeological sites are also present in the Preserve. The MacKerricher State Park General Plan (1995) directed the establishment of the 1,285-acre Preserve to recognize the regional and statewide significance of the outstanding natural values of the Inglenook Fen complex and the Ten Mile Dunes.

ENVIRONMENTAL REVIEW AND FEASIBILITY STUDY

Due to the sensitivity and rarity of the resources in the Preserve, state and federal resource agencies have expressed concern regarding potential impacts that would result from implementation of the project. DPR, through consultation with state and federal agencies, has determined that impacts to these sensitive resources could not be entirely avoided and preparation of an Environmental Impact Report/Environmental Impact Statement (EIR/EIS) would be necessary to comply with the California Environmental Quality Act and National Environmental Policy Act (CEQA/NEPA).

Because of regulatory concerns, the presence of sensitive resources, and coastal storm/erosion hazards, DPR is preparing this feasibility study of the proposed trail through the Preserve, prior to initiating the formal CEQA/NEPA process. This feasibility study consists of an evaluation of five alternative trail alignments. Four of the alternatives include new trail construction and/or repair of the existing trail. New trail construction options considered through the dunes include a combination of raised boardwalk and hardened surface. The fifth alternative, the Ward Avenue Terminus, would not include new trail construction or trail repair in the Preserve.

SUMMARY OF CONCLUSIONS

Based on the results of this study, the feasibility of three alternatives that would include new trail construction through the Preserve (i.e., Haul Road, Setback, and Shortcut) would be threatened because of regulatory compliance and funding issues. The Ward Avenue Terminus and the Northern alternatives appear to be feasible. Specific threats to the feasibility of the Haul Road, Setback, and Shortcut alternatives include impacts to listed plants and wetlands, damage to trail surfaces from erosion and dune instability, and general cost concerns. Refer to Table 2-1 for a summary description, feasibility constraints, and feasibility conclusions for each alternative.

Two listed plant species, Howell's spineflower (*Chorizanthe howellii*) and Menzies' wallflower (*Erysimum menziesii menziesii*), have the potential to affect the feasibility of the Haul Road, Setback, and Shortcut alternatives. Both species are protected under the state and federal Endangered Species acts. The only known population of Howell's spineflower is located in the vicinity of MacKerricher State Park. Menzies' wallflower is found only in Mendocino and Monterey counties, and the Mendocino County populations of Menzies' wallflower are located primarily in the vicinity of MacKerricher State Park. Impacts to Howell's spineflower and Menzies' wallflower are expected to be so substantial that if DPR proceeds with any of these alternatives, a jeopardy opinion could conceivably be issued by the U.S. Fish and Wildlife Service (USFWS) and/or the California Department of Fish and Game (CDFG). CDFG has already indicated its concerns in a letter to DPR about jeopardizing the continued existence of Howell's spineflower (CDFG 1998). If a jeopardy opinion were issued, the project's eligibility for federal funding would be threatened (D. Harmon, pers. comm., 2000).

Potential impacts to wetlands would also threaten federal funding of the Setback and Shortcut alternatives, because compliance with Executive Order 11990 may not be possible. To comply with Executive Order 11990, DPR would need to demonstrate that all practicable alternatives to avoid filling of wetlands, and practicable measures to minimize harm to wetlands, had been considered.

The Haul Road and Shortcut alternatives would include extensive new trail construction through areas subject to coastal erosion and dune instability. As a result, damage to these trail surfaces is expected to be substantial and would require extensive and relatively frequent repair and potentially extensive reconstruction. In addition, physical features of the hinddunes, such as steepness and instability, would make trail construction problematic. Costs associated with construction and maintenance of these trails would be very high and may substantially exceed the funding currently

available. These difficulties with construction and repair and the associated costs threaten the feasibility of the Haul Road and Shortcut alternatives.

Other feasibility issues examined in this report include: potential impacts to the western snowy plover and other state- and federally-listed Threatened and Endangered species; compliance with Section 404 of the Clean Water Act; and compliance with Section 106 of the National Historic Preservation Act. These issues were determined to not have the potential to affect the feasibility of any of the proposed alternatives. Consistency with Public Resources Code Provisions and General Plan policies was also examined.

Certain provisions of both the PRC and General Plan require protection of the sensitive resources that are the basis for designating the area as a natural preserve. None of the provisions explicitly prohibit the construction of a trail in the Preserve. They do include provisions requiring public access to state park land. DPR is responsible for determining compliance of the proposed trail with the PRC and General Plan, so it is not known whether this consistency issue would threaten feasibility. DPR must weigh the degree of impact of the proposed trail on sensitive resources with its public access responsibilities.

It should be noted that only the Haul Road and Setback alternatives, by themselves, fulfill the objective of an alternative route to Highway 1 for bicycle travel from Ft. Bragg to Ten Mile River. If this is the paramount objective for developing the trail, the feasibility of its achievement is threatened. Because the primary reason for ISTEA funding of the trail is the bicycle route, this federal funding of the project is also threatened.

Another fundamental question is whether beach recreation users and pedestrians in the dunes should be encouraged, allowed with restrictions, discouraged, or prohibited in the Preserve. The extent of trail facilities is a major factor in determining the amount of public use.

Table 2-1
EXECUTIVE SUMMARY

Alignment Alternative	Feasibility Constraint	Feasibility Conclusion
Haul Road Alternative. The Haul Road Alternative corresponds to the proposed project as identified in the ISTEA grant proposal. This alternative would include a trail aligned with the former haul road. This would require approximately 5,900 feet of new trail construction in the area south of Inglenook Fen where the haul road has eroded, and surface treatment of approximately 14,000 feet of existing pavement, which may include repair of potholes, some resurfacing, and sand removal.	Compliance with the Federal Endangered Species Act Compliance with the California Endangered Species Act Coastal Erosion and Dune Instability Potential for Project to Exceed Available Funding	FEASIBILITY THREATENED
Setback Alternative. The Setback Alternative would include a trail primarily aligned with the haul road, incorporating a bypass trail across the dunes east of the washout area. This alternative would require approximately 6,400 feet of new trail construction and surface treatment of approximately 14,000 feet of existing pavement, which may include repair of potholes, some resurfacing, and sand removal. Boardwalks would be needed to protect wetland and other sensitive habitat areas.	Compliance with the Federal Endangered Species Act Compliance with the California Endangered Species Act Compliance with Executive Order 11990	FEASIBILITY THREATENED
Shortcut Alternative. The Shortcut Alternative would include a trail from the haul road, just south of the washout, to Highway 1 and north along the Park boundary for approximately one mile. This alternative would require approximately 9,500 feet of new trail construction and surface treatment of approximately 1,200 feet of existing pavement, which may include repair of potholes, some resurfacing, and sand removal. A parking area to accommodate 15-20 vehicles would be developed where the trail meets Highway 1 at the southeast corner of the Preserve. Substantial grading and/or structures would be needed in steep portions off the hinddunes.	Compliance with the Federal Endangered Species Act Compliance with the California Endangered Species Act Compliance with Executive Order 11990 Coastal Erosion and Dune Instability Potential for Project to Exceed Available Funding	FEASIBILITY THREATENED

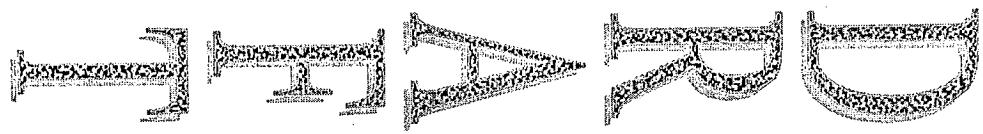

Table 2-1
EXECUTIVE SUMMARY

Alignment Alternative	Feasibility Constraint	Feasibility Conclusion
Northern Alternative. The Northern Alternative would include a trail along the northern portion of the haul road. A parking area would be developed south of the Ten Mile River Bridge, and a trail would be constructed to connect the parking area to the haul road. The rest of the trail would follow the alignment of the haul road from the Ten Mile River Bridge to a point somewhere north of the washout. This alternative would require approximately 1,300 to 2,300 feet of new trail construction and surface treatment of approximately 13,000 feet of existing pavement, which may include repair of potholes, some resurfacing, and sand removal.	None	FEASIBLE
Ward Avenue Terminus. The Ward Avenue Terminus would terminate the existing trail at Ward Avenue. No design features of this alternative have been specified by DPR but they could include expanding the Ward Avenue beach parking area and development of additional facilities, such as restrooms and an interpretive center.	None	FEASIBLE

2 OVERVIEW OF THE DECISION

2.1 PROJECT OBJECTIVES AND STATUS

PROJECT OBJECTIVES

As part of the MacKerricher Coastal Trail Project, DPR is proposing to upgrade 6.4 miles of the former haul road, which parallels the coastline of MacKerricher State Park. This section of the haul road has been closed to vehicular traffic since a major washout in the northern segment occurred during the winter of 1983. Bicyclists and pedestrians have continued to utilize remaining intact portions of the paved trail. If completed as currently proposed, the project would provide a continuous, non-motorized-use trail from the City of Fort Bragg to Ten Mile River, near the beach. This trail would be a safer travel route for bicyclists and pedestrians compared to use of Highway 1. DPR is seeking 88% of the funding ($1,130,000) for this project from the FHWA ISTEA program. The remaining 12% ($200,000) would come from the California Department of Transportation's Environmental Enhancement and Mitigation (EEM) Program. The funding is intended to cover improvements to the Pudding Creek Trestle and realignment of the trial at Lake Cleone, in addition to trail improvements north of Ward Avenue.

The primary objective of the Coastal Trail Project, as originally submitted in 1994 by DPR as part of a statewide package for funding five segments of the California Coast Bicycle Route, is:

- To reconstruct and repair the haul road to provide a multi-use recreational trail from the City of Fort Bragg to Highway 1 at Ten Mile River.

The proposed project, as originally submitted, contained the following components:

- Repair the Pudding Creek trestle;
- Construct a new trail alignment near Lake Cleone;
- Construct 3,000 feet of boardwalk to bypass washout sections of the Ten Mile Dunes;
- Repair and pave the haul road; and
- Develop a publicly owned trail connection to Highway 1 at Ten Mile River through acquisition of approximately seven acres of private land.

At a meeting held on December 1, 1999, at Russian Gulch State Park, DPR noted the following as secondary goals of the project. The meeting was attended by DPR, the Federal Highway Administration (FHWA), CalTrans, and EDAW, the environmental consultant preparing the project's EIR/EIS under contract to DPR.

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- Maintaining and enhancing coastal and Park access (components may include developing access at the north end of the Preserve, developing parking areas, minimizing volunteer trails, minimizing trespassing on private land, and increasing wheelchair accessibility);
- Protecting natural and cultural resources;
- Complying with applicable regulatory and policy requirements; and
- Meeting the requirements of the state and federal funding programs.

PROJECT STATUS

Preliminary studies related to the environmental permitting process and baseline data collection have been underway since the ISTEA grant was approved. During this preliminary study period, state and federal resources agencies, as well as members of the public have expressed concerns that the project could have significant effects on sensitive resources of the 1,285-acre Preserve. Potential impacts to resources in the Preserve have been expressed as the primary issue of both CDFG and USFWS. In particular, these agencies are concerned about the potential for impacts to state and federally listed species. Other concerns expressed by agencies and the public include the adverse effects related to dynamic coastal dunes, protection of significant archeological sites, adherence to state policies and statutory provisions, protection of wetlands and other sensitive habitats, and costs associated with trail construction.

In response to agency concerns, DPR staff completed a draft Biological Assessment in 1998, as specified under Section 7 of the federal Endangered Species Act (ESA) (Pasquinelli 1998). The purpose of the Biological Assessment was to evaluate the effects of the project on listed species. The Biological Assessment included an evaluation of three general categories of project alternatives: 1) no project; 2) repair of the trestle, repavement of existing surface, and reconstruction of the haul road as it previously existed through the washed out sections; and 3) the proposed project. Preparation of the Biological Assessment included consultation with numerous representatives from state and federal agencies. Also incorporated into the Biological Assessment were field survey results and a review of relevant documentation. The final Biological Assessment has not been completed.

Preparation of the project's Environmental Impact Report/Environmental Impact Statement (EIR/EIS) has been deferred pending completion of this feasibility study and confirmation or modification of the proposed project's description.

2.2 FEASIBILITY STUDY PURPOSE AND APPROACH

FEASIBILITY STUDY PURPOSE

The purpose of this feasibility study is to provide sufficient objective information to assess the feasibility of five alternatives, recognizing the issues of special-status species impacts, wetland impacts, coastal erosion, dune dynamics, general cost reasonableness (a reasonable cost would be one

that would not substantially exceed the amount of funding currently available), and statutory/regulatory/policy issues.

DPR will use the feasibility study to seek additional input from state and federal resource agencies and the public about the proposed coastal trail. Based on the findings of the study and agency and public input, DPR will determine how to proceed with the proposed project and whether to modify its description.

FEASIBILITY STUDY APPROACH

This analysis focuses only on the data needed to evaluate the feasibility of each alternative. Consultation with DPR staff, existing documentation and aerial photographs provided by DPR staff, and letters from state and federal resource agencies regarding the project were used to identify feasibility issues. Resource specialists on the EDAW team conducted reconnaissance surveys of the alternative alignments to assess specific issues related to feasibility. Each alternative was evaluated independently to determine if one or more of the issues under consideration exceeds an established threshold of feasibility. The feasibility issues addressed in this report are:

- Compliance with the federal Endangered Species Act
- Compliance with the California Endangered Species Act
- Compliance with Section 404 of the Clean Water Act
- Compliance with Executive Order 11990
- Coastal erosion and dune instability
- Compliance with Section 106 of the National Historic Preservation Act
- Consistency with state statutory provisions and general plan polices
- Potential for project to substantially exceed available funding.

3 AFFECTED ENVIRONMENT

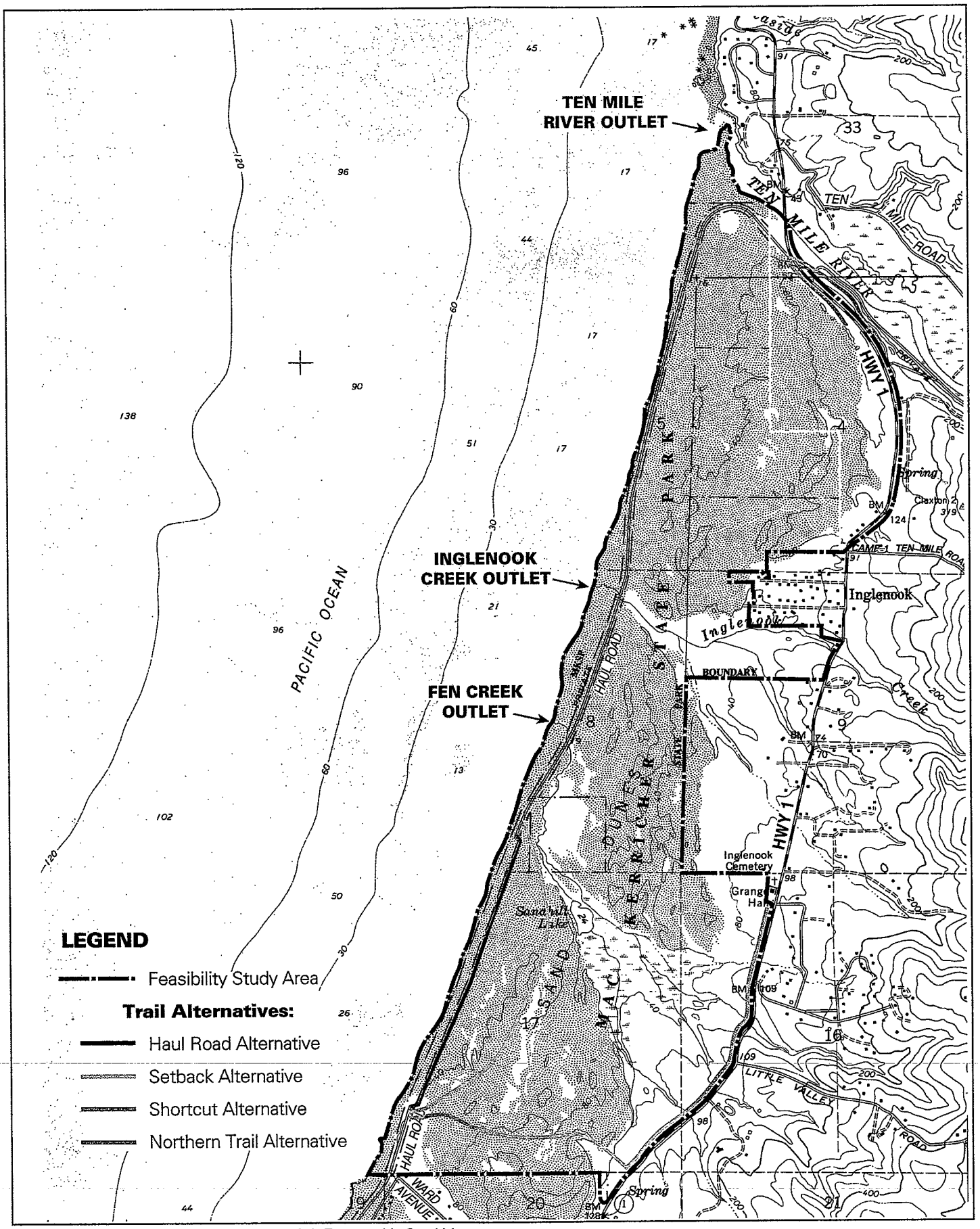
3.1 TRAIL STUDY AREA

The feasibility study area generally includes the MacKerricher State Park property between Ward Avenue and Ten Mile River, which includes the 1,285-acre Preserve (Exhibit 3.1). Resource specialists participating in this study focused their evaluations on the five alignment corridors. Sections of the alignments crossing private and public land, not owned by DPR, were also included in the study area. The widths of the alternative alignment corridors vary, depending upon the feasibility issue under consideration. The fifth trail alignment, the Ward Avenue Terminus, which would not extend north of Ward Avenue, and portions of the proposed project south of Ward Avenue are not included in the study area. These areas were not included because the effects on the environment south of Ward Avenue are not expected to influence the feasibility of the trail north of Ward Avenue.

3.2 SUMMARY DESCRIPTION OF EXISTING CONDITIONS

Lying on top of the oldest marine terrace in the area, the study area is characterized by 3.3 miles of sandy shoreline backed by low bluffs and an extensive dune complex that is referred to as the Ten Mile Dunes. The Ten Mile Dunes complex, considered one of the largest native dune ecosystems in California, is a series of transverse dunes and associated precipitation ridges. Transverse dunes are formed by winds of moderate velocity that move light sand, while precipitation ridges are steep-sided dune features that form where moving sand driven by strong winds is stopped by a mass of vegetation (DPR 1995).

In addition to coastal dunes, a variety of habitats are found in the study area, including coastal prairie, wetland, and riparian. In most areas, the hinddunes are sparsely vegetated with patches of native upland herb and wetland habitats interspersed between large areas of open sand. The lack of vegetation in the hinddunes permits unrestricted sand movement over large areas, which is an important component of the natural dune ecosystem. Between Highway 1 and the hinddunes, coastal prairie habitat is found in association with the Inglenook Fen and Inglenook Creek drainages. Vegetation in the foredunes is considerably more widespread, and dominant vegetation types include native upland herb, seasonal and perennial wetlands, and dense patches of European beachgrass. Permanent wetlands are primarily restricted to Inglenook Fen, Sandhill Lake, Fen Creek, and Inglenook Creek, while seasonal wetlands supporting varying amounts of herbaceous vegetation are scattered throughout the foredunes. Riparian habitat is present along Fen and Inglenook creeks, and along the south side of Ten Mile River near Ten Mile River Bridge. Non-native, European beachgrass is especially prevalent between the haul road and the beach, where it has stabilized a substantial portion of the foredunes between Ten Mile River and Inglenook Fen. Growing in dense stands, the beachgrass has displaced much of the native vegetation and is responsible for increasing the height of the foredunes.



Base Map Source: Inglenook, California U.S.G.S. Topographic Quad Map.

Study Area and Vicinity

EXHIBIT 3.1

MacKerricher Coastal Trail Project - Feasibility Study
JN 9T185.02 2/00

0' 1000' 2000'

NORTH

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Other than the existing the haul road, the study area is almost entirely undeveloped, and recent human alteration of the natural environment has been relatively minor. The haul road is a paved surface that parallels the coastline through MacKerricher State Park and the Preserve. The stretch that crosses the study area primarily occurs in dune habitats, though some wetlands are also encountered. At wetland crossings, there are culverts to facilitate water flow under the road. Where the pavement is intact, it covers a width of 16 feet. The beach in this southern section of the study area is retreating, as evidenced by the eroding bluff and the loss of portions of the haul road. In this area, two large sections of the haul road have washed out, and the portion between these sections is heavily damaged. Based on the results of GPS data collection during the summer of 1999, a total of approximately 4,300 linear feet of the haul road have completely washed out and approximately another 1,600 linear feet are considered heavily damaged.

Common visitor activities in the study area include walking, bicycle riding, and horseback riding. The region between the Ward Avenue parking area and the washout experiences higher visitor use than other portions of the study area, particularly on the seaward side of the haul road. In general, when pedestrians, traveling south to north, reach the washout area, they either make their way through the foredunes to the beach to walk north or continue north along the haul road alignment through the foredunes until the pavement starts again (Pasquinelli 1998). In this area, and to a lesser extent near Ten Mile River, volunteer trails have become established from people leaving the haul road to access the bluff and beach. Visitor use in the northern area of the study area is much less frequent than in the more accessible southern area. Generally, visitors access the northern study area either from the south or from an undeveloped parking area south of the Ten Mile River Bridge. The majority of the equestrian use in the study area results from guided rides conducted by a concessionaire near the main entrance of the park (DPR 1995). Equestrian use from adjacent private properties has also been observed (R. Pasquinelli, pers. comm., 2000).

4 TRAIL ALIGNMENT ISSUES

Issues presented in the following discussion include those that may affect the feasibility of the project.

4.1 THREATENED AND ENDANGERED SPECIES

Potential impacts to species listed as state and/or federally Threatened or Endangered were assessed through a review of existing documentation and supplemented with results of field surveys conducted by EDAW, Mad River Biologists (MRB), and DPR biologists in 1999. The review of existing documentation includes an analysis of a GIS habitat classification scheme created using 1994 (April) aerial negatives of the study area (Henrici 1999). It should be noted that because the Preserve environment is dynamic, the results of this analysis should not be used as a direct correlation to current habitat conditions (i.e., the relative abundance and distribution of the different habitats examined have likely experienced minor changes since April 1994). However, this analysis does suffice for the purposes of this study.

SURVEYS CONDUCTED

Surveys for both special-status plants and special-status wildlife species have been conducted in the study area. Limited surveys for listed plants were conducted by DPR in 1994, 1995, and 1996. MRB, with assistance from DPR staff, conducted surveys for listed plants in May and June of 1999. The survey area was limited to a corridor extending a minimum of 150 feet from either side of the haul road. In areas where the haul road was eroded, the survey corridor extended 300 feet onshore from the edge of the eroded bank. The specific location, phenology, and relative abundance of each listed plant population was described and mapped.

To quantify suitable habitat for listed plants, EDAW examined results of the MRB surveys in conjunction with recently developed GIS vegetation layers for the Preserve (Henrici 1999). EDAW also consulted with DPR and USFWS resource specialists to obtain information on the habitat requirements of Howell's spineflower and Menzies' wallflower. For this analysis, suitable habitat for Howell's spineflower and Menzies' wallflower includes areas designated by Henrici (1999) as upland native herb. Coastal bluff was also included as suitable habitat for Howell's spineflower. Howell's spineflower is sometimes found in open dune habitat that otherwise lacks vegetation and in upland introduced grasslands (A. Pickart, pers. comm., 2000). Open dune and introduced grassland were not included as suitable habitat in this analysis, because Howell's spineflower is usually absent from these habitats. For both plants, it is assumed that only a portion of the total area of suitable habitat is occupied during any given year. However, because the seeds of both plant species are easily dispersed, any area where suitable habitat is present could become occupied in the future provided the habitat conditions persist.

In recent years, limited surveys for western snowy plover have been conducted in the study area. In 1999, DPR, MRB, and EDAW biologists conducted monthly one-day field surveys to document the number, behavior, and location of western snowy plovers in the Preserve. In addition, suitable and

potentially suitable nesting habitat was identified and mapped. Areas mapped as suitable nesting habitat include portions of the Preserve that closely resembled occupied nesting habitat in Humboldt County and Oregon (R. LeValley, pers. comm., 2000). Potentially suitable nesting habitat includes areas that could be suitable after implementation of restoration measures (e.g., removal of European beachgrass, removal of the haul road, removal of culverts at creek crossings).

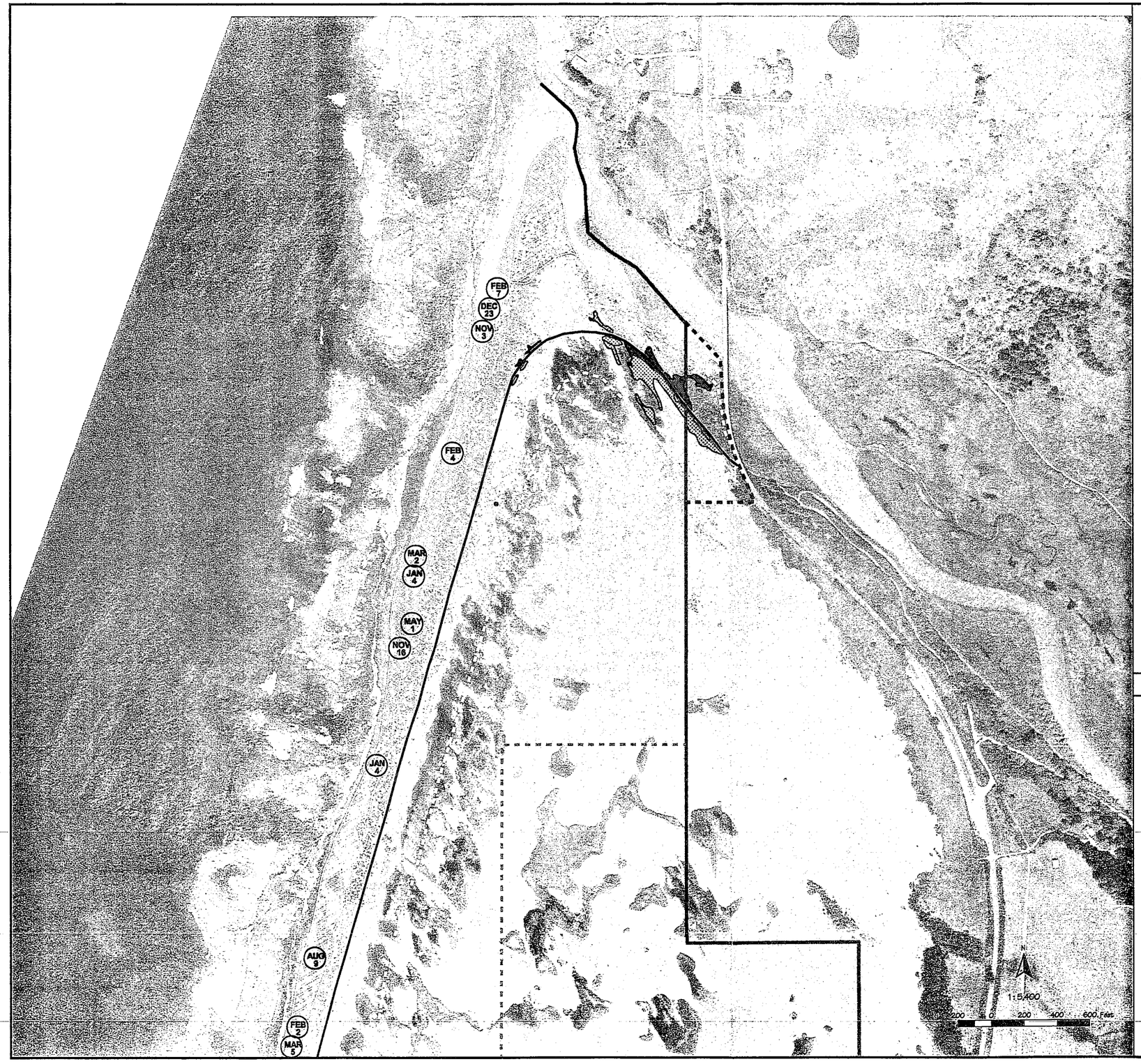
LISTED PLANT SPECIES

The study area provides habitat for three state and/or federally listed plants: Menzies' wallflower (*Erysimum menziesii menziesii*), Howell's spineflower (*Chorizanthe howellii*), and marsh sandwort (*Arenaria paludicola*). Menzies' wallflower and Howell's spineflower are discussed in detail below because significant impacts to either species may affect the feasibility of the project. A small population of marsh sandwort was discovered in the Preserve in 1999 (R. Pasquinelli, pers. comm., 2000). It is assumed that impacts to the marsh sandwort population could be avoided because the entire distribution of the plant is restricted to a small area in the Inglenook Fen. A minimum of ten additional special-status plant species that are not state or federally listed could occur in the area. Although impacts to these species could be significant, they are not expected to influence feasibility of the project.

Howell's Spineflower (Chorizanthe howellii)

Howell's spineflower is state listed as Threatened and federally listed as Endangered. The only known population of Howell's spineflower is located between Pudding Creek and Ten Mile River. This population is composed of many small groups and scattered individuals. Howell's spineflower occurs in coastal dunes and adjacent sandy soils of coastal prairies. The blooming period is generally from May to July. Animals, to which the spiny seeds attach, and wind may facilitate seed dispersal. Seedlings become established in relatively open, sandy substrates where there are fewer competing plants of other species; they do not become established where aggressive non-natives dominate the habitat (Pasquinelli 1998).

Suitable habitat for Howell's spineflower is found throughout a substantial portion of the upland habitat in the study area (Exhibits 4.1-1 and 4.1-2). Between Ten Mile River and Inglenook Creek, suitable habitat occurs primarily within a 500-600 foot band on the east side of the haul road. Between Inglenook Creek and Ward Avenue, suitable habitat extends into the hinddunes. Surveys conducted in 1999 documented Howell's spineflower at 22 locations in the alternative trail corridors. The majority of these locations were immediately adjacent to the haul road. The highest concentrations found in the survey were at the northern end of the study area, just west of the Ten Mile River Bridge, and at the southern end of the study area, just north of Ward Avenue.



MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 4.1-1
Results of 1999 Field Surveys

LEGEND

Threatened and Endangered Species Occurrences

Howell's Spineflower (Chorizanthe howellii): Relative Abundance
- High
- Medium
- Low

Menzies' Wallflower (Erysimum menziesii): Relative Abundance
- High
- Medium
- Low

1999 Western Snowy Plover
(Charadrius alexandrinus nivosus)
- JAN 3 — Non-Breeding Season (August - April) Text inside the circle shows month, and number of occurrences
- MAY 2 — Breeding Season (May - July) Text inside the circle shows month and number of occurrences

Western Snowy Plover Nesting Habitat
- Currently Suitable (depending on condition of beach)
- Potentially Suitable (with habitat modification)

Boundary Information
- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site
- Study Area Boundary

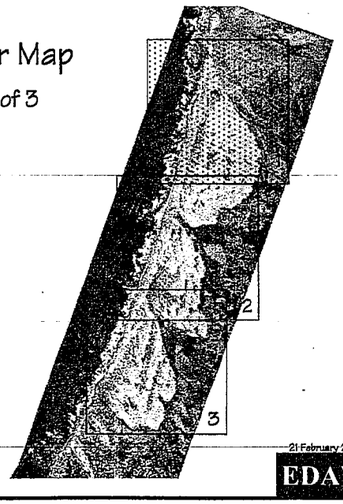
Haul Road
- Existing
- Completely Washed Out
- Severely Damaged

Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc; MacKerricher State Park General Plan, June 1995.

Locator Map

Map 1 of 3



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MACKERRICHER COASTAL TRAIL PROJECT

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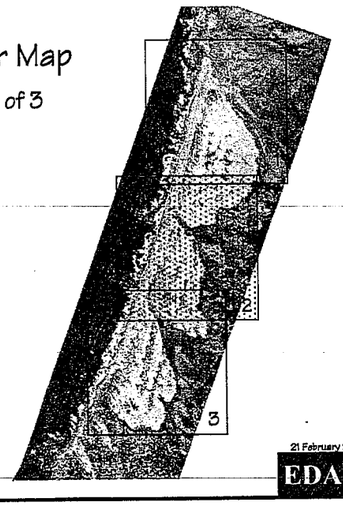
Map 2 of 3



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MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 4.1-1
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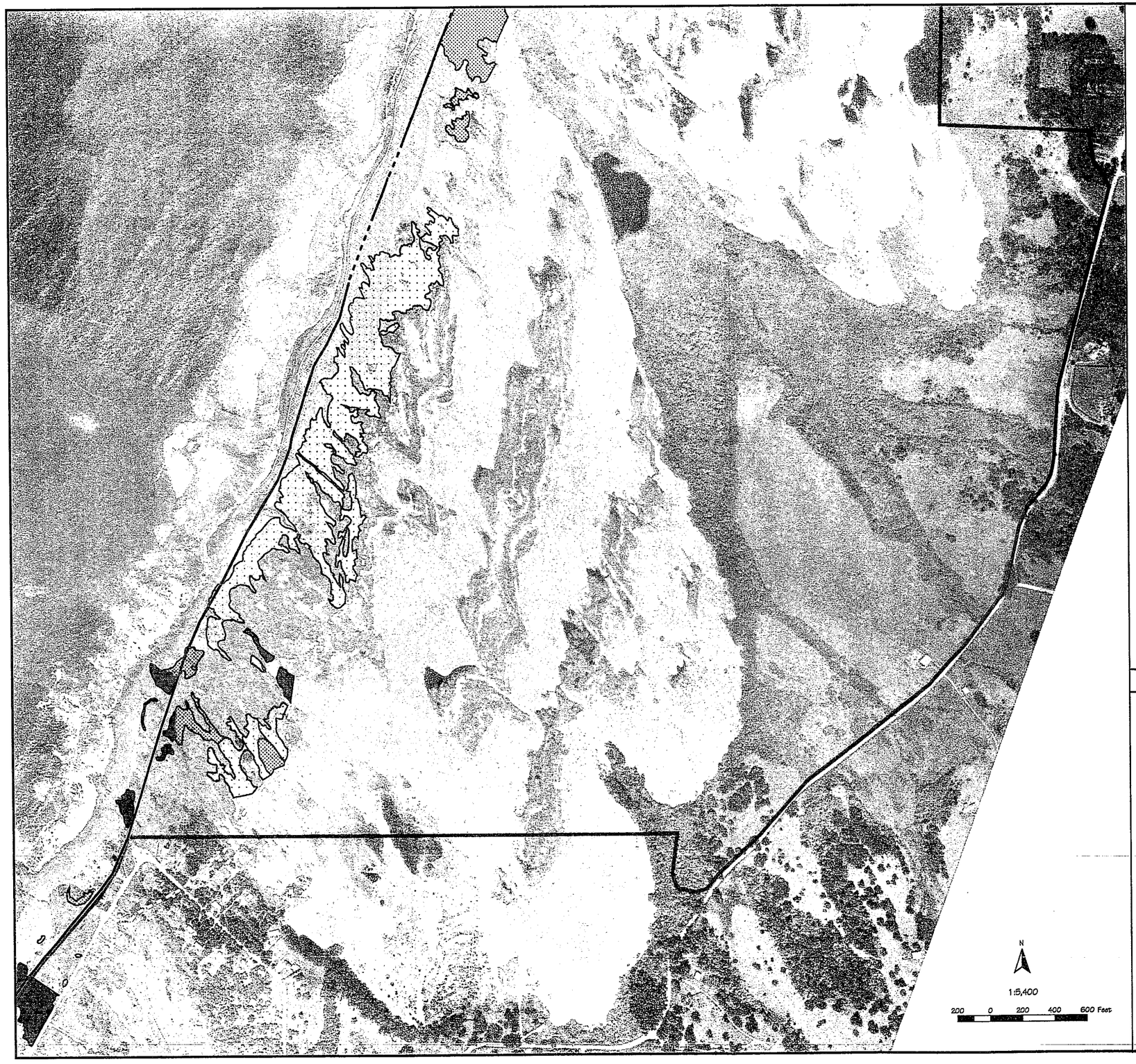

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(Charadrius alexandrinus nivosus)
- JAN 3 — Non-Breeding Season (August - April) Text inside the circle shows month, and number of occurrences
- MAY 2 — Breeding Season (May - July) Text inside the circle shows month and number of occurrences

Western Snowy Plover Nesting Habitat
- Currently Suitable (depending on condition of beach)
- Potentially Suitable (with habitat modification)

Boundary Information
- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site
- Study Area Boundary

Haul Road
- Existing
- Completely Washed Out
- Severely Damaged

Footnotes: 1 Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

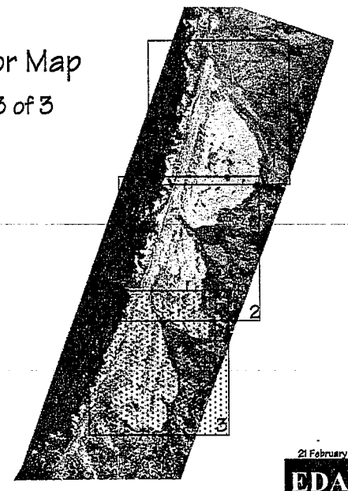
N

1:5,400

200 0 200 400 600 Feet

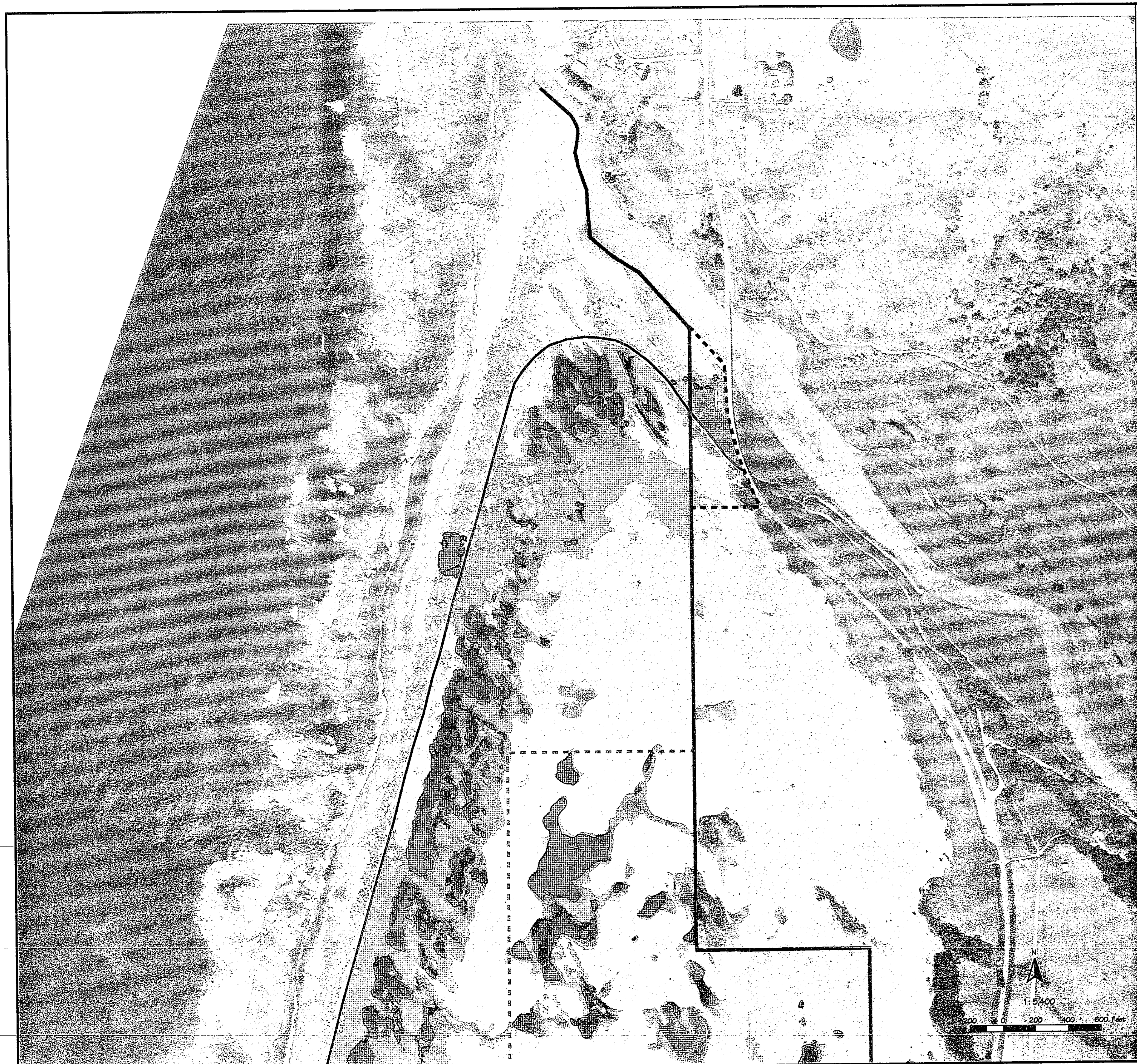
Locator Map

Map 3 of 3



21 February 2000

EDAW



MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 4.1-2
Sensitive Habitats

LEGEND

Listed Plant Habitats

Coastal Bluff

- Upland Native Herbs

Wetlands

- Wetland Introduced Grasses
- Wetland Native Herbs
- Wetland Native Shrubs
- Wetland Native Trees
- Open Water

Boundary Information

- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site

Haul Road

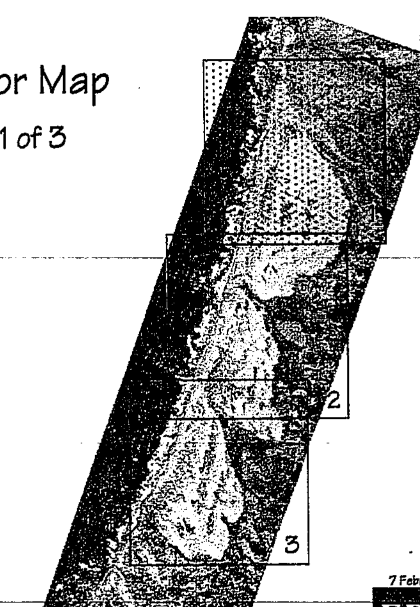
- Existing
- Completely Washed Out [1]
- Severely Damaged [1]

Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1998; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

Locator Map

Map 1 of 3



7 February 2000

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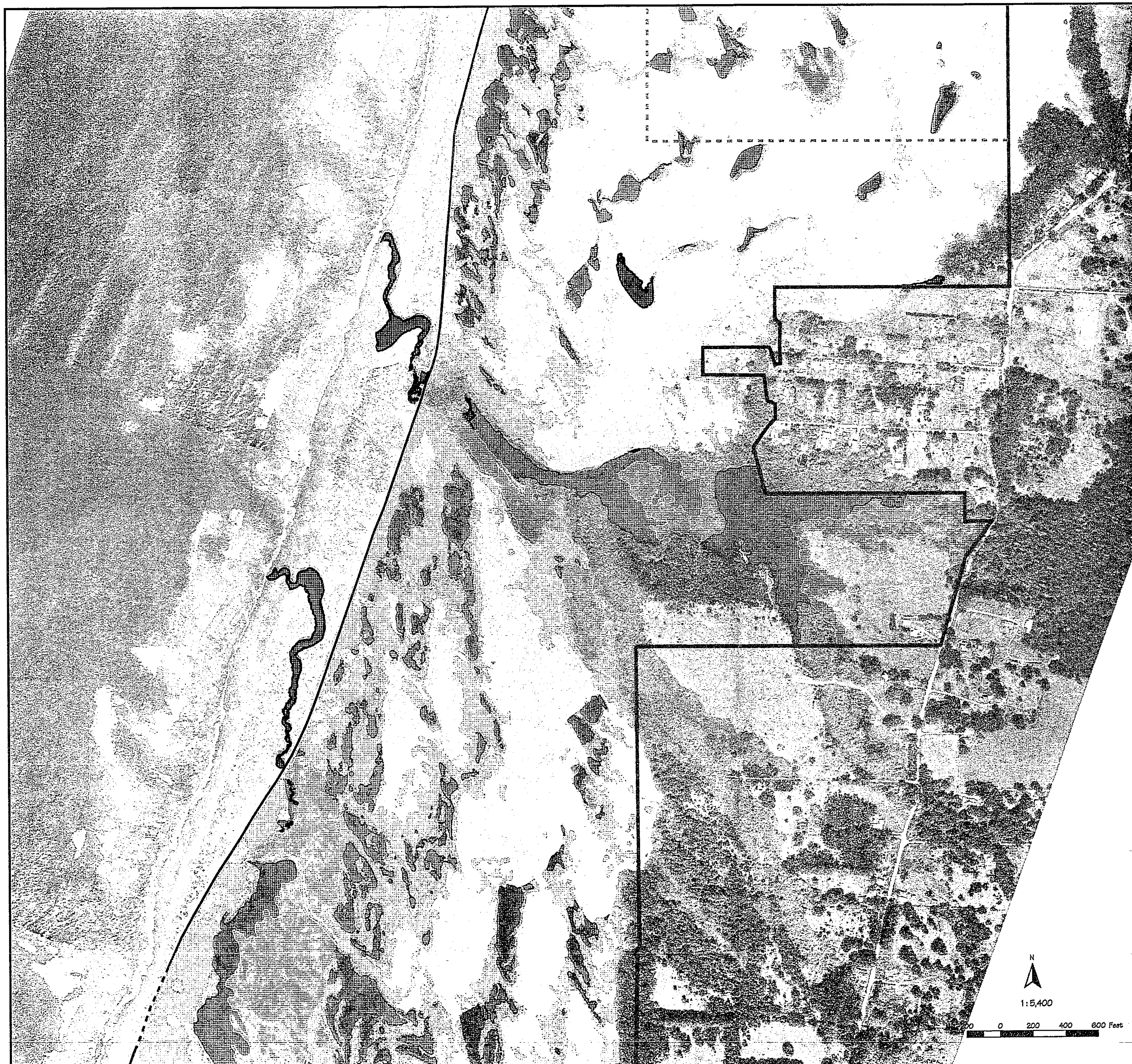

MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 4.1-2
Sensitive Habitats

LEGEND

Listed Plant Habitats

Coastal Bluff

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Boundary Information

- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site

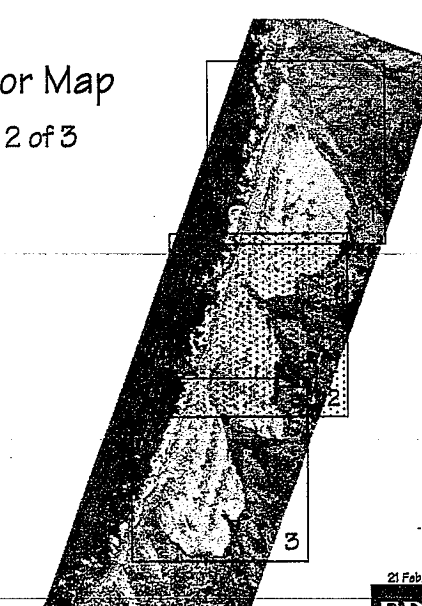
Haul Road

- Existing
- Completely Washed Out [1]
- Severely Damaged [1]

Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

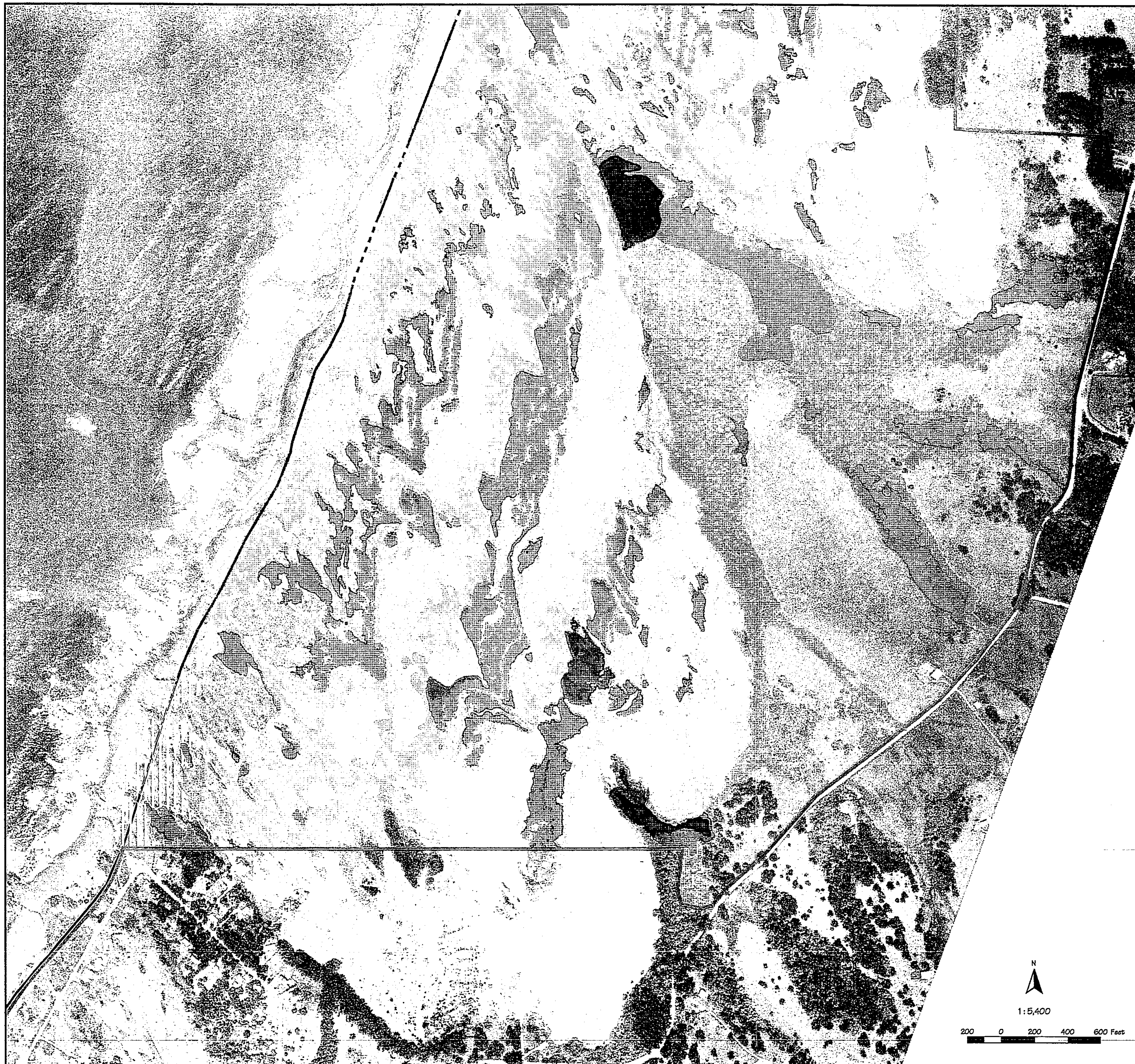
Locator Map
Map 2 of 3



21 February 2000

EDAW

p:/1999/9t195.01/plots/sens_hab2



MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 4.1-2
Sensitive Habitats

LEGEND

Listed Plant Habitats

- Coastal Bluff
- Upland Native Herbs

Wetlands

- Wetland Introduced Grasses
- Wetland Native Herbs
- Wetland Native Shrubs
- Wetland Native Trees
- Open Water

Boundary Information

- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site

Haul Road

- Existing
- Completely Washed Out [1]
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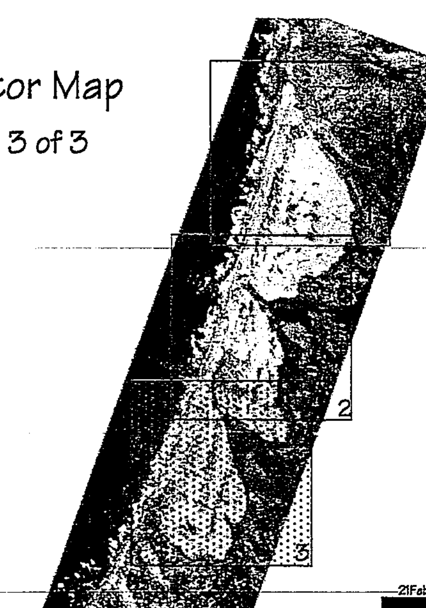
Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

Locator Map
Map 3 of 3



21February 2000

EDAW

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Menzies' Wallflower (Erysimum menziesii menziesii)

Menzies' wallflower is state and federally listed as Endangered. This subspecies is found in Monterey and Mendocino counties. The Mendocino County populations of Menzies' wallflower are located almost exclusively within MacKerricher State Park and the study area. The Preserve has the largest recorded natural population of the species (Pasquinelli 1998). Menzies' wallflower is monocarpic, meaning that it flowers once in its lifetime. The blooming period is March to June. Menzies' wallflower is a biennial or short-lived perennial whose seeds are dispersed by wind and water. Seedlings do not compete well in areas with dense vegetation (Pasquinelli 1998).

Surveys conducted in 1999 documented Menzies' wallflower throughout a substantial portion of the haul road survey corridor, from Ward Avenue to Inglenook Creek. Wallflower plants were also documented just north of Inglenook Creek and just west of the Ten Mile River Bridge (Exhibit 4.1-1). As with Howell's spineflower, suitable habitat occurs in almost the entire stretch of foredunes from Ward Avenue to the Ten Mile River Bridge and throughout much of the hinddunes between Inglenook Creek and Ward Avenue.

LISTED WILDLIFE SPECIES

The Preserve provides important habitat for a number of special-status wildlife species. One federally listed species, the western snowy plover,was considered in this feasibility study. The only other listed wildlife species known to occur in the vicinity of the preserve is the tidewater goby (*Eucyclogobius newberryi*), which occurs at the mouths of Pudding Creek and Ten Mile River. The tidewater goby, which is currently listed as federally Endangered, has recently been proposed for delisting. Because the proposed trail is not expected to affect the aquatic habitat of the tidewater goby, it is not discussed further in this study. Additional non-listed special-status wildlife species are known to occur in the Preserve. Impacts to these species could be significant but are not expected to affect the feasibility of the project.

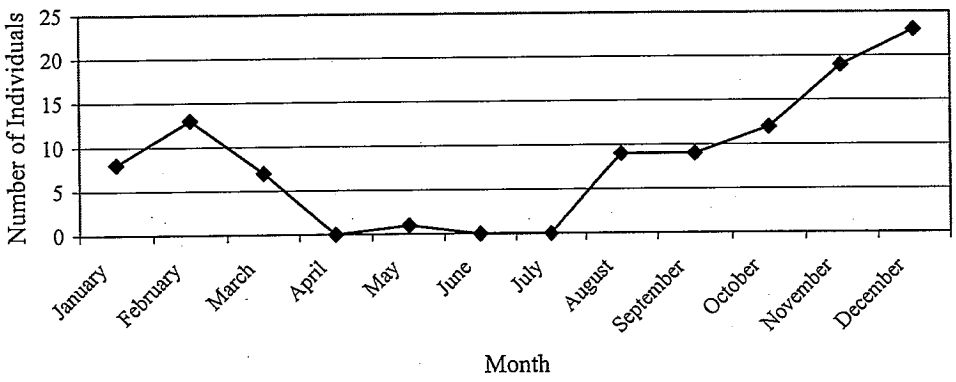
Western Snowy Plover (Charadrius alexandrinuss nivosus)

The Pacific coast breeding population of the western snowy plover is federally listed as Threatened. Within California, most breeding occurs from southern San Francisco Bay southward. Small breeding numbers are also present in several coastal counties in northern California. USFWS recently released the Final Rule Designation of Critical Habitat for the Pacific Coast Population of the Western Snowy Plover. No portions of MacKerricher State Park or the remainder of Mendocino County were designated as critical habitat by USFWS (Federal Register 1999).

The breeding season for the western snowy plover extends from early March to late September; birds at more southerly locations begin to nest earlier in the season than those at more northerly locations. Snowy plovers require open, relatively flat, unvegetated areas for nesting. Sand spits, dune-backed beaches, beaches at creek and river mouths, and salt pans at lagoons and estuaries are the preferred habitats for nesting (Federal Register 1999). Suitable snowy plover nesting habitat occurs on both sides of the haul road along most of the washout and damaged sections. Suitable and potentially

suitable plover nesting habitat also occurs between the beach and foredunes along most of the haul road from Ten Mile River to Fen Creek (Exhibit 4.1-1). In some areas the invasion of European beachgrass has stabilized the foredunes, making the slopes so steep that it is unlikely that snowy plovers would attempt to nest. The most recent known nesting attempt in MacKerricher State Park occurred at Virgin Creek Beach in 1994, but an unknown predator or person destroyed the nest soon after it was found (Pasquinelli 1998). In 1998 and 1999, monthly surveys conducted during the breeding season detected adult plovers, but no nests were found (EDAW 1998, EDAW 1999, Fabula 1999). The maximum number of wintering plovers detected during a single survey was 23 (December 1999). The number of plovers detected during each survey in 1999 is presented in Figure 4-1, and detection locations are presented in Exhibit 4.1-1.

Figure 4-1
Number of Snowy Plovers Detected During 1999 Monthly Surveys



ISSUE 4.1-1

Compliance with the federal Endangered Species Act (ESA).

For this project, an interagency consultation under Section 7 of the federal Endangered Species Act (ESA) would be required because the project has the potential to take a federally listed species. Section 7 of ESA [16 U.S.C. 1531 et seq.] outlines the procedures for federal interagency cooperation to conserve federally listed species and designated critical habitat for federally listed species. The Section 7 consultation for this project would involve the FHWA, as a funding agency for the project, and USFWS, which has the authority to allow take of a listed species. If for any reason FHWA decides to withdraw funding for the project, the U.S. Army Corps of Engineers (USACE) would provide an alternative federal nexus for interagency consultation should the project require a permit for wetland fill.

Section 7(a)(1) directs the Secretary (Secretary of the Interior/Secretary of Commerce) to review other programs administered by them and utilize such programs to further the purposes of the Act. It also directs all other federal agencies to utilize their authority in furtherance of the purposes of the Act by carrying out programs for the conservation of species listed pursuant to the Act.

This section of the Act makes it clear that all federal agencies should participate in the conservation and recovery of listed threatened and endangered species. Under this provision, federal agencies often enter into partnerships and Memoranda of Understanding with USFWS for implementing and funding conservation agreements, management plans, and recovery plans developed for listed species. Section 7(a)(2) states that each federal agency shall, in consultation with the Secretary, insure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat.

Take of a federally listed species may be approved through a Section 7 consultation between USFWS and another federal agency only if certain conditions are met. A Biological Assessment is prepared, pursuant to ESA Section 7, to evaluate the effects of a project on listed and proposed threatened and endangered species. USFWS then prepares a biological opinion, based on information from the biological assessment and other sources, to determine if the proposed action may jeopardize the continued existence of the listed species. If the proposed action does not jeopardize the continued existence of a species, the biological opinion may provide an incidental take statement, which authorizes a certain level of incidental take contingent upon the implementation of specified terms and conditions to minimize such take and mitigate for its effects.

ISSUE 4.1-2

Compliance with the California Endangered Species Act (CESA)

The presence of state-listed species in the study area would require consultation with CDFG pursuant to CESA (Fish and Game Code Section 2081 et seq.). CESA directs that state agencies should not approve projects as proposed that would jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. Furthermore, CESA states that reasonable and prudent alternatives shall be developed by CDFG, together with the project proponent and the state lead agency, consistent with conserving the species, while at the same time maintaining the project purpose to the greatest extent possible (Fish and Game Code Section 2053).

4.2 WETLANDS

Waters of the U.S. include wetlands (e.g., special aquatic sites such as seasonal ponds and marshes) and other jurisdictional waters, such as lakes, ponds, rivers, and intermittent drainages. Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and

duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. The majority of jurisdictional wetlands meet three wetland delineation criteria: hydrophytic vegetation, hydric soil types, and wetland hydrology.

The study area includes both seasonal and perennial wetlands. Seasonal wetlands are present throughout the study area, particularly in the backdune areas, while the largest permanent wetland areas occur at Inglenook Fen, Sandhill Lake, Fen Creek, and Inglenook Creek. Wetlands in the study area were identified using aerial photographs, GIS vegetation data layers, and 1999 EDAW field survey results (Exhibit 4.1-2). A formal USACE jurisdictional wetland delineation has not been completed for the study area.

ISSUE 4.2-1

Compliance with Section 404 of the Clean Water Act

The U.S. Army Corps of Engineers (USACE) regulates Waters of the U.S. under Section 404 of the Clean Water Act. Pursuant to Section 404 of the Clean Water Act, a permit must be obtained from USACE prior to any activity that involves the discharge of dredge or fill materials into Waters of the U.S. Permits authorized by USACE for wetland fills include both individual permits and nationwide permits. Under current USACE regulations, fills of less than 3 acres may be covered under a nationwide permit, while fills exceeding 3 acres would require an individual permit. Modified nationwide permits, which may reduce the amount of wetland fill allowed, are scheduled to become effective May 1, 2000.

Individual permits may be issued following a full public review of the proposed project. After a permit application has been filed, a Public Notice is distributed by USACE to all known interested parties. A decision on whether to issue the permit is made by USACE after evaluating all comments and information received. The permit decision is generally based on the outcome of a public interest balancing process, in which the benefits of the project are weighed against its detriments. A permit is granted unless the project is found to be contrary to the public interest.

Nationwide permits are general permits issued by USACE that authorize activities throughout the nation. These permits, which include not-to-exceed limits of wetland fill, are valid only if the conditions applicable to the permit are met.

ISSUE 4.2-2

Compliance with Executive Order 11990

Executive Order 11990 provides legal protection for wetlands in order to avoid, to the extent possible, the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a

practicable alternative (EPA 1997). Specifically, Executive Order 11990 states that "each agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for providing federally undertaken, financed, or assisted construction and improvements.

4.3 DYNAMIC COASTAL DUNE ENVIRONMENT

The dune system, known as the Ten Mile Dunes, has developed on a low elevation, gently sloping coastal terrace between Ten Mile River and Ward Avenue. The terrace upon which the dune system has formed is thought to represent an actively subsiding marine terrace that is sloping gently to the north and west. Continued coseismic subsidence, combined with rising sea level, has resulted in localized coastal erosion and shoreline retreat. The epicenter of the erosion appears to have shifted up and down the coastline within the study area, affecting at least three separate coastal reaches over the last 15 years. The sands that comprise the moving dunes originate from coastal erosion and from river sediment that is delivered to the beach environment. This sand is deposited on the strand and moved into the dune environment through a series of coastal and aeolian processes. Dune forms and the rate of sand transport and dune movement vary considerably within the dune field, both temporally and spatially.

Coastal processes in the study area are most easily evaluated by an analysis of historic stereo aerial photography. A number of flights, beginning in the early 1940s, have included this portion of the coast. Stereo aerial photography, in combination with known landmarks on the ground, can be used to document the historic movement of transverse dunes and terminal precipitation ridges within the dune field. The haul road provides a spatial landmark that can be used to document and measure the occurrence of coastal erosion and retreat. Scale-corrected photos from 1970, 1986 and 1998 (Willard 1999) were used to measure coastal retreat relative to the haul road. Isolated dune measurements were taken for this feasibility study but a detailed analysis of the movement of dune fronts across the entire Ten Mile Dune field was not attempted. Air photos can also be employed to evaluate changing vegetation patterns (such as the invasion and spread of European beachgrass) within the dune field. Field observations, ground measurements and photography were employed to document the occurrence of dune forms, aeolian processes, relative rates of erosion and sand transport, and coastal processes that could affect potential trail alignments.

ISSUE 4.3-1

Coastal Erosion and Dune Instability

The foredunes of the study area are active landforms that should be considered temporary features (DPR 1995). Reconstruction of a permanent trail in the washout and damaged areas would likely entail frequent repair or subsequent reconstruction and could preclude feasibility of the project (USFWS, October, 1998). Coastal erosion and dune instability are considered feasibility issues

because of the potential that portions of new or repaired trail could be damaged or destroyed by coastal erosion and by the natural changes to landforms that occur regularly in the study area.

4.4 CULTURAL RESOURCES

The study area contains evidence of human activities from prehistoric times through the present. Several archaeological surveys have been conducted in the study area (Flaherty 1988, Flaherty 1993, Origer 1976, and Schultz 1985), resulting in documentation of 12 prehistoric sites. The majority of these sites are prehistoric use areas located in dunes near the sandy beaches or on terraces overlooking the rocky shore. Virtually all sites are evidenced by shell-laden middens of varying depth and density. An intensive investigation of eleven sites provides the most detailed information currently available on the archaeological resources within the study area (White 1989).

The cultural resource overview for MacKerricher State Park (Schultz 1985) emphasizes the difficulties in managing cultural resources within this highly unstable environment, particularly given the magnitude of impacts resulting from recreational use. Management recommendations note the need to more fully examine the most heavily damaged sites, to minimize disturbances from pedestrian and equestrian traffic through fencing and signing, and the potential benefits from stabilization efforts based primarily on revegetation.

ISSUE 4.4-1

Compliance with Section 106 of the National Historic Preservation Act

Section 106 of the National Historic Preservation Act, and related regulations, require federal agencies to consider the potential effect of their undertakings on resources that are listed in, or are eligible for listing in, the National Register of Historic Places (National Register). Section 106 further requires consultation between the federal agency, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation. The federal agency must also consider the possible need for consultation with Tribal Historic Preservation Officers, Indian tribes, and local government representatives. Finally, 36 CFR Part 800.2(d) emphasizes the need to seek and consider the views of the public prior to making final decisions on a proposed project that could affect significant cultural resources.

The Section 106 process involves efforts to identify resources within the area of potential effects established for the project, and to evaluate the significance of those resources relative to the criteria listed in 36 CFR Part 60.4. To be eligible for listing in the National Register, a property normally must be 50 years of age or more; it must possess historic significance; and it must possess integrity of location, design, setting, materials, workmanship, feeling, and association. Historic significance is the importance of a property to the history, architecture, archaeology, engineering, or cultural aspects of a community. To qualify for the National Register, a property must have significance in American history at the local, state, or national level. This importance can be present in districts, sites, buildings, structures, and objects that possess integrity and are:

- Associated with events that have made a significant contribution to the broad patterns of history;
- Associated with the lives of persons significant to our past;
- Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that posses high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
- Have yielded, or may be likely to yield, information important in prehistory or history.

Once the number and nature of historic properties within the area of potential effects from the proposed project are understood, the federal agency must determine whether the proposed action would affect historic properties. A proposed undertaking is considered to have an effect on historic properties under the following conditions:

> An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to the features of a property's location, setting, or use may be relevant depending upon a property's significant characteristics and should be considered.

The methods and criteria to be used to determine potential adverse effects and the process to resolve such effects are described in 36 CFR Part 800.5 and 800.6. Examples of adverse effects under these regulations include, but are not limited to: the physical destruction or damage to all or part of a property; change of the character of a property's use or of physical features within the property's setting that contribute to its historic significance; or the introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.

4.5 DPR POLICIES AND PRC PROVISIONS

State policies and provisions have been developed to address concerns regarding coastal public access and coastal resource protection. Applicable policies and provisions for this project are included in the Public Resources Code (PRC) and the MacKerricher State Park General Plan.

PUBLIC RESOURCES CODE

The PRC provides statutory direction for the planning, use, and management of the state park system. The PRC provides for the classification of the state park system into units, based on resources and management or use objectives. The PRC also includes provisions that relate to recreational use and coastal access. Applicable provisions of the PRC are discussed below.

Natural Preserve Provisions

The MacKerricher State Park General Plan (1995) directed the establishment of the 1,285-acre Preserve to recognize the regional and statewide significance of the outstanding natural values of the

Inglenook Fen complex and the Ten Mile Dunes. The definition and purpose of units of the state park system designated as natural preserves is described in Section 5019.71 of the PRC: "natural preserves consist of distinct areas of outstanding natural or scientific significance established within the boundaries of other state park system units. The purpose of natural preserves shall be to preserve such features as rare or endangered plant and animal species and their supporting ecosystems, representative examples of plant or animal communities existing in California prior to the impact of civilization, geological features illustrative of geological processes, significant fossil occurrences or geological features of cultural or economic interest, or topographic features illustrative of representative or unique biogeographical patterns. Areas set aside as natural preserves shall be of sufficient size to allow, where possible, the natural dynamics of ecological interaction to continue without interference, and to provide, in all cases, a practicable management unit. Habitat manipulation shall be permitted only in those areas found by scientific analysis to require manipulation to preserve the species or associations which constitute the basis for the establishment of the natural preserve." Section 5001.9(b) of the PRC states that "no new facility may be developed in any unit of the state park system unless it is compatible with the classification of that unit."

Recreation and Coastal Access Provisions

The PRC addresses public use and enjoyment of designated units in the state park system. Section 5002.2(e) states that "consistent with good planning and sound resource management, the department shall, in discharging it responsibilities under this section, attempt to make units of the state park system accessible and usable by the general public at the earliest opportunity." Section 5003 of the PRC directs DPR to "administer, protect, develop, and interpret the property under its jurisdiction for the use and enjoyment of the public." Similarly, Section 5019.53 of the PRC states that "improvements undertaken within state parks shall be for the purpose of making the areas available for public enjoyment and education in a manner consistent with the preservation of natural, scenic, cultural, and ecological values for present and future generations."

The PRC also provides statutory direction regarding coastal access policies. In 1979 the Coastal Public Access Program was legislated, calling for a trail route linking state parks, federal recreation areas, and other areas of significance located in coastal areas. The implementation of a public coastal access program for the length of California's coastline, including maintaining and updating an access inventory, keeping records of easements and dedications, and expediting the opening of new accessways for public use are responsibilities of the California Coastal Commission (PRC 30530 et seq.). Section 30530 of the PRC states the intent "that a program to maximize public access to and along the coastline be prepared and implemented in a manner that ensures coordination among and the most efficient use of limited fiscal resources by federal, state, and local agencies responsible for acquisition, development, and maintenance of public coastal accessways."

MacKerricher State Park General Plan Policies

The MacKerricher State Park General Plan sets forth goals for park management and use and also identifies and analyzes the relative importance of the park's many resources, providing guidelines as to how they be preserved and managed. The document also portrays the patterns and intensities of

desirable uses and the nature and location of proposed development. Sections applicable to the project are found throughout the general plan but the goals and directives most relevant are presented in the Resource, Land Use, and Facilities elements. The Resource Element evaluates the natural and cultural resources of the park and sets management directives for protection, restoration, and use of these resources. The Land Use Element describes current land uses, defines planning issues, and outlines land use goals. The Land Use Element also determines land use intensities and land use patterns to establish directions for future park management and use that will best fulfill the goals of the park. The Facilities Element proposes future development to enhance public enjoyment of the park's resources and other values. It also establishes specific design criteria for proposed development to protect the park's esthetic values and to provide for the welfare and safety of park visitors. Relevant sections of the Resource, Land Use, and Facilities Elements are discussed below.

Protection of Natural and Cultural Resources

Protection of natural and cultural resources is addressed in the Resource and Land Use Elements of the General Plan. Directives, goals, and recommendations pertaining to the protection of natural and cultural resources are presented below.

Resource Element Directives

- Special plants within MacKerricher State Park shall be protected and managed for their perpetuation in accordance with state law. Plant species listed as rare, threatened, or endangered, under state law or as endangered or threatened under federal law shall be a high management priority. Any proposed activity that would potentially affect plants listed by the state shall require formal consultation with CDFG as specified in CESA.

- Programs or projects shall be planned and designed so that special-status plants will not be adversely affected.

- Threatened, endangered, and candidate wildlife species in the park shall be a high management priority. These species shall be protected and managed for their perpetuation in accordance with state and federal law.

- The department shall protect and perpetuate western snowy plovers and their foraging and nesting habitat. The western snowy plover is a listed species; the bird and its habitat are protected by federal law, so the department shall consult with CDFG and USFWS on the best management practices for the species' habitat within MacKerricher State Park.

- The department's objective is to preserve and protect the archaeological sites within the unit.

- All restoration, improvement, and maintenance of the haul road and the trestle must be accomplished without damage to historic resources, except where visitor safety would be compromised.

- New trail construction shall minimize effects on natural, cultural and scenic resources. Proposed trail routes shall be reviewed by a department resource ecologist and a department archeologist to evaluate impacts and shall be approved by the District Superintendent. All unauthorized existing trails shall be abandoned and restored to natural contours and conditions.

- The department shall develop access points and trails using techniques and materials that are in harmony with the natural dynamics of the dune system and fit as naturally and unobtrusively as possible into the dune environment. If inflexible structures must be used they will be considered expendable and will not be protected against natural forces.

- All trails and roadways through wetland areas should be avoided. If avoidance is not possible, trails and roadways through wetland areas shall be designed and constructed to allow access over, but not on, structurally weak wetland soils.

Land Use Element Goals

- Protect the park's sensitive resources.
  Specific actions for achievement of this goal include: restrict access in areas most sensitive to impacts (the fen and other wetlands, and the sand dunes); and reduce the amount and level of use in areas with sensitive plants and animals, such as Virgin Creek Beach, the area northwest of Lake Cleone, and the tidepools at Laguna Point.

- Identify, protect, and preserve the significant prehistoric and historic resources of MacKerricher State Park.
  Specific actions for achievement of this goal include: reduce, control and, where possible, eliminate access to historical archeological sites.

Trail Improvements and Coastal Access

Improvement of park trails and coastal access is addressed in the Land Use and Facilities elements. Relevant goals and recommendations are presented below.

Land Use Element Goals

- Promote access to and recreational opportunities within the park.
  Specific actions for achievement of this goal include: provide for a variety of land uses and developed facilities that protect sensitive areas and promote appropriate activities in areas where public use is encouraged, and provide a series of access points that spread out use in the park and contain suitable support facilities.

Facilities Element Recommendations

- Improve the surface of the haul road so that it is safe and comfortable for pedestrians and bicyclists.
- Repair eroded areas along the haul road. In some places, the road will require shoring up, while in others bypasses will be required due to ongoing erosion by the ocean.
- Remove volunteer trails on the coastal terrace and in the dunes to which the haul road provides access.
- Provide a boardwalk to bypass the dune area north of Ward Avenue where the haul road has been washed out, to serve hikers, bikers, and persons with disabilities.
- The structure of the boardwalk should not adversely impact the dune surface and should allow for easy relocation as the configuration of the dunes changes over time.
- Provide regulatory signage. As the dune area is part of a natural preserve, access should be discouraged except on the boardwalk.
- When possible, acquire an interest either by purchase or through an easement from a willing landowner for use of sufficient land south of the Ten Mile River Bridge to park 30 vehicles, including spaces for horse trailers and for visitors with disabilities.

ISSUE 4.5-1

Consistency with Statutory General Plan Policies and Provisions

The PRC and MacKerricher State Park General Plan include requirements for improving coastal public access and protecting coastal natural resources. In some cases, these requirements are contradictory to the extent that it would not be possible for the project to achieve consistency with all General Plan recommendations and PRC Provisions. Ultimately, it would be the responsibility of DPR to determine if conflicts with General Plan Policies and PRC Provisions would threaten the feasibility of a particular alternative. Similarly, the relative importance of achieving consistency with a particular General Plan Policy or PRC Provision would need to be evaluated by DPR.

4.6 General Cost Reasonableness

The cost of the project would vary depending on the type of trail and the habitat and features that would be encountered. Repair of existing haul road surfaces would be considered a lower cost activity, while construction of new trail surfaces would be considered a higher cost activity, particularly those sections that encounter dune and wetland habitats. Reconstruction of the washout and damaged section of the haul road may also be considered higher cost if it is likely to need regular repair as a result of continued erosion.

ISSUE
4.6-1

Potential for Project to Substantially Exceed Available Funding

DPR is seeking to obtain a total of $1,330,000 from FHWA and the California Department of Transportation to complete the trail project, including improvements outside the segment analyzed in this study. At this time, it is unknown whether it would be possible to obtain additional funding from these agencies, or another agency, should it become necessary. For the purposes of this study, any alternative that substantially exceeds the amount of funding currently available would not be considered feasible.

5 FEASIBILITY ANALYSIS

5.1 INTRODUCTION TO THE ALTERNATIVES CONSIDERED

Five alternatives were developed by EDAW, in consultation with DPR, for consideration in this feasibility study. One of these, the Ward Avenue Terminus Alternative, would not include new trail construction or repair of the existing haul road in the study area north of Ward Avenue. The remaining four alternatives include varying lengths of new trail construction and repair of the existing trail. The alternatives were defined to cover a broad range of potential trail facilities, including ones that met some but not all of the proposed project's objectives. The selected alternatives do not represent all of the possibilities, but are sufficient to illustrate feasibility of a trail facility in the study area.

Schematic representations of new trail construction associated with these alternatives are shown in Exhibit 5.1. New trail construction through the dunes would include a combination of raised boardwalk and hardened surface. DPR has not specified the exact location of the two trail surfaces. All new trail sections would be 10 feet wide, which is sufficient for two-way bicycle travel. Boardwalk sections would have no shoulder, while ground level trail would include two-foot-wide shoulders on each side. Where the haul road is intact, the width of the trail would remain approximately 16 feet with two-foot-wide shoulders on each side.

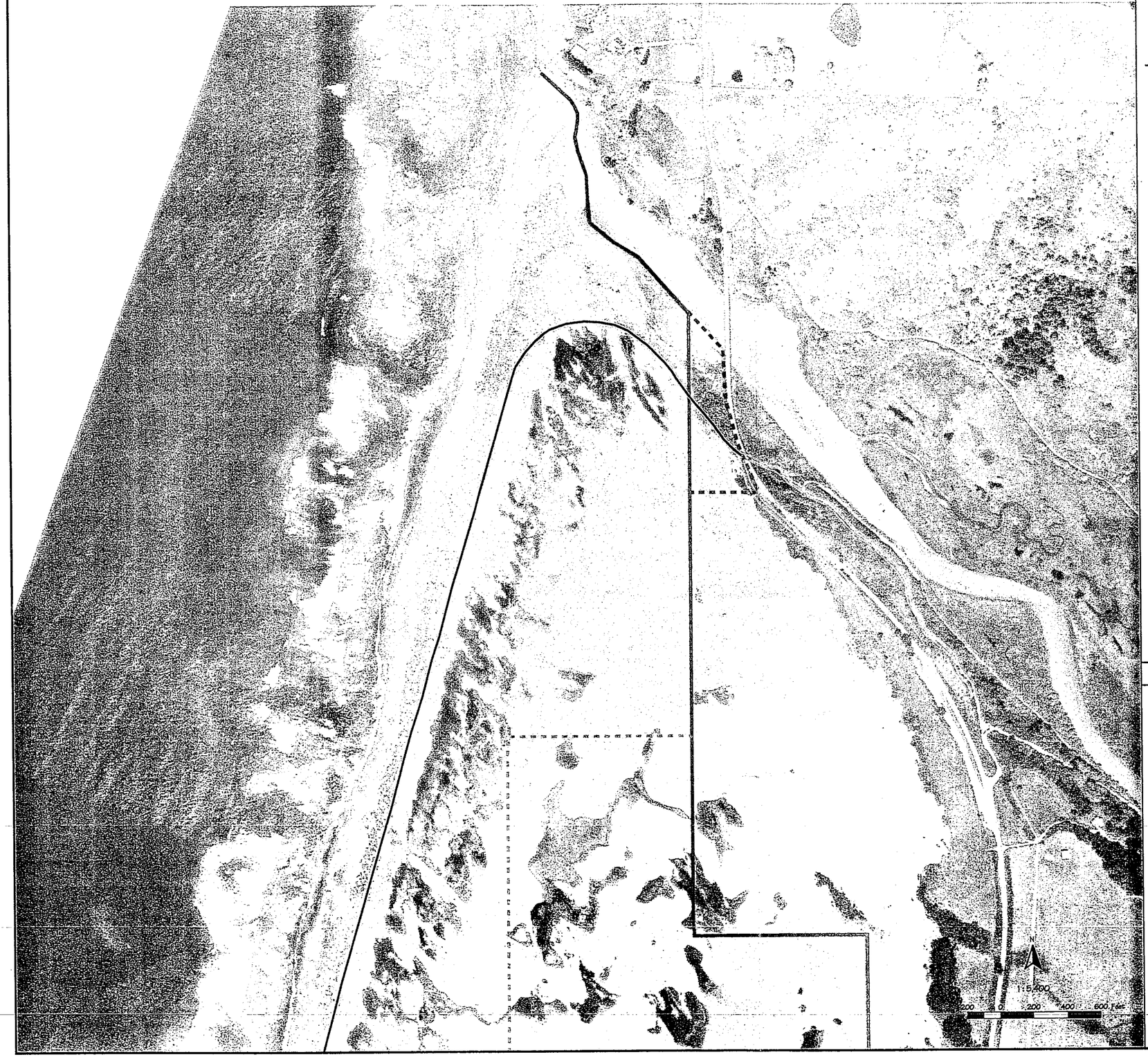
A description of the five alternatives and a discussion of the issues related to the feasibility of each alternative are presented below. They assume an alternative would need to be funded by state and federal sources. Alternatives that would not provide a continuous, non-motorized-use route between Ward Avenue and Ten Mile River may not qualify for federal ISTEA funding; therefore, to be feasible other funding may need to be secured.

5.2 WARD AVENUE TERMINUS ALTERNATIVE

Under the Ward Avenue Terminus Alternative, the northern end of the trial would terminate at Ward Avenue. No design features of this alternative have been specified by DPR but they could include expanding the Ward Avenue beach parking area and development of additional facilities, such as restrooms and an interpretive center. The Ward Avenue Terminus would not include any new trail construction or repair of the existing trail in the Preserve. Therefore, substantial impacts to the Preserve would be minimized or avoided. However, because the Ward Avenue Terminus would not meet the primary project objective described in the ISTEA grant application, it is unknown if this alternative would meet state and federal funding requirements for the project.

MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 5.1
Trail Alternatives



LEGEND

Trail and Parking Area Alternatives

- Haul Road Alternative
- Setback Alternative
- Shortcut Alternative
- Northern Trail Alternative
- Potential Parking Area

Boundary Information

- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site

Haul Road

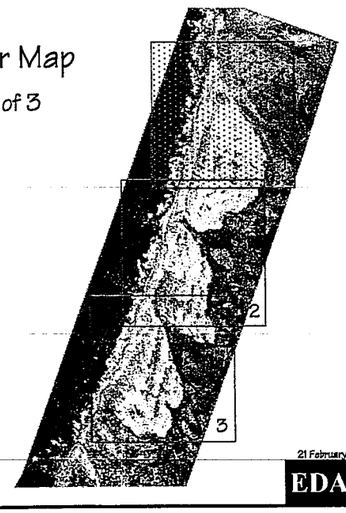
- Existing
- Completely Washed Out[1]
- Severely Damaged[1]

Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

Locator Map

Map 1 of 3

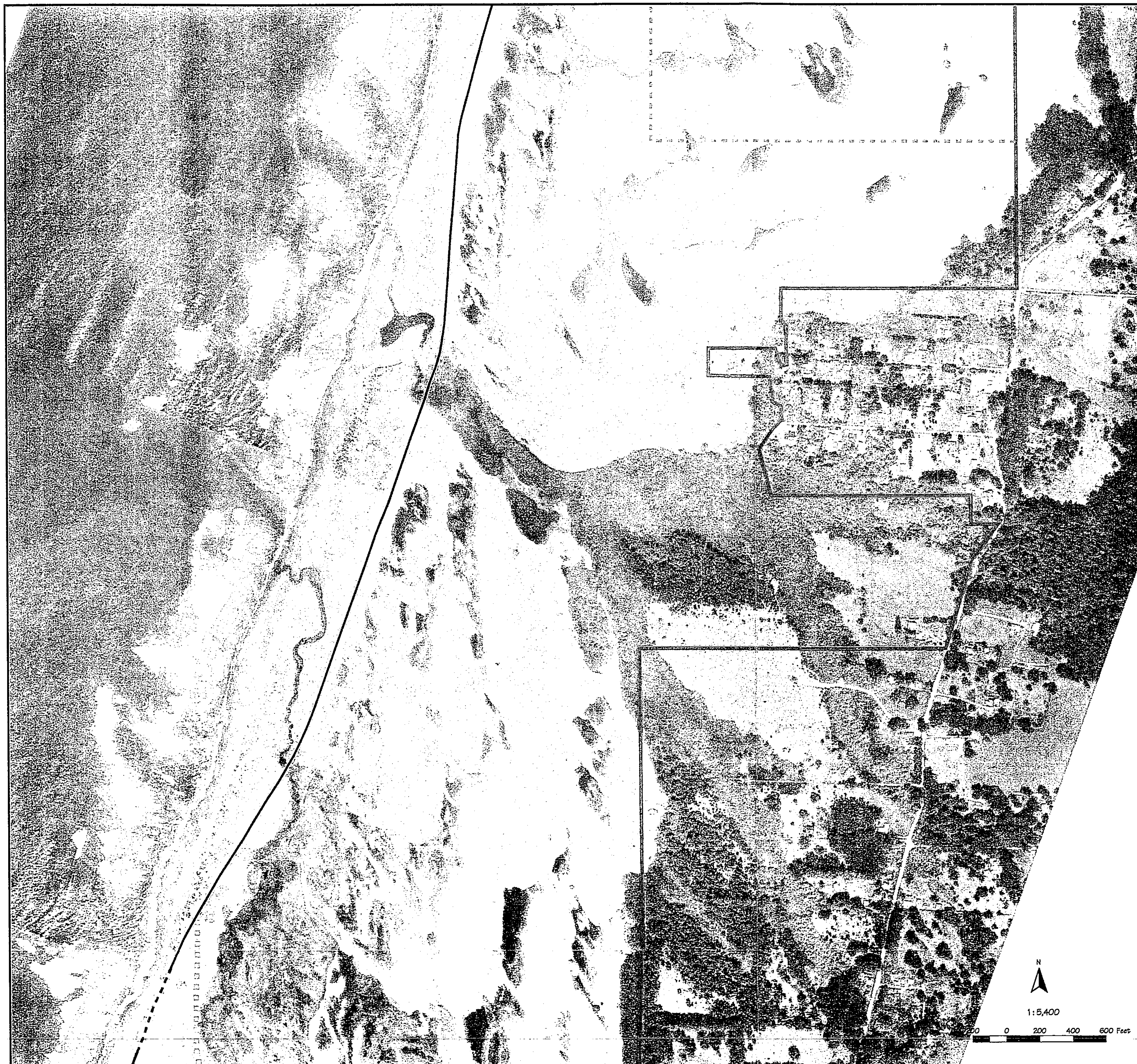


21 February 2000

EDAW

MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 5.1
Trail Alternatives



LEGEND

Trail and Parking Area Alternatives

- Haul Road Alternative
- Setback Alternative
- Shortcut Alternative
- Northern Trail Alternative
- Potential Parking Area

Boundary Information

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Haul Road

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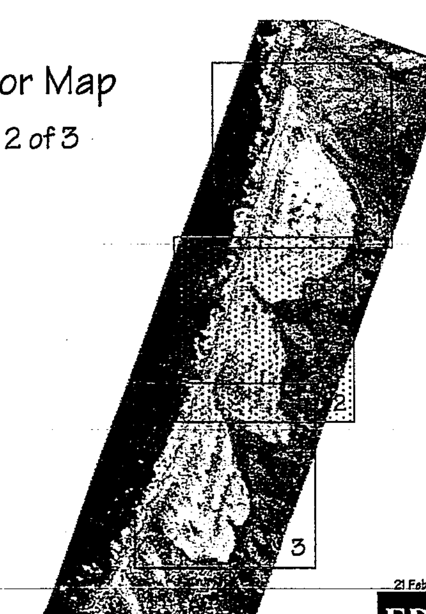
- Severely Damaged[1]

Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

Locator Map
Map 2 of 3



21 February 2000

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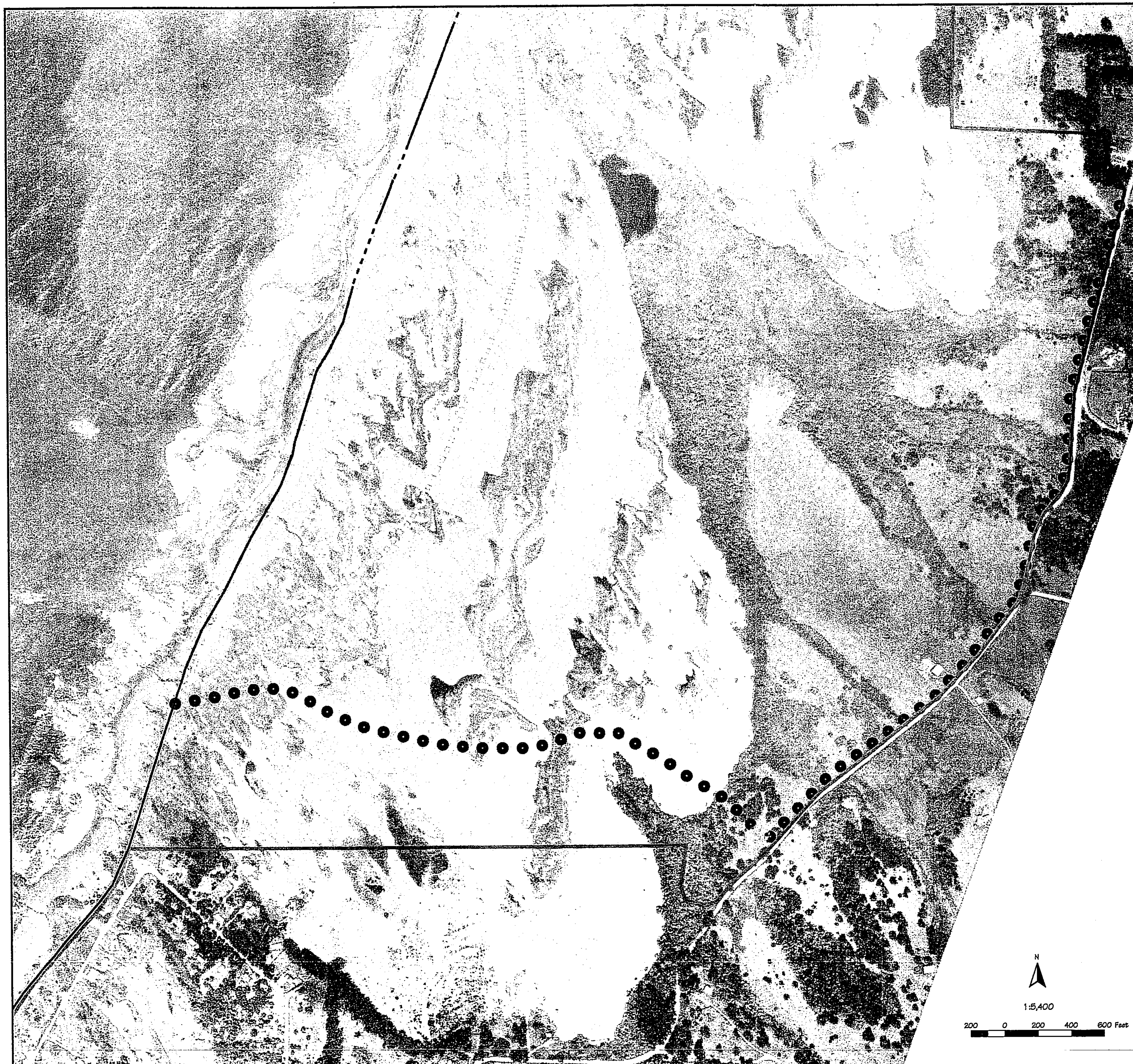


MACKERRICHER COASTAL TRAIL PROJECT

Exhibit 5.1
Trail Alternatives

LEGEND

Trail and Parking Area Alternatives

- Haul Road Alternative
- Setback Alternative
- Shortcut Alternative
- Northern Trail Alternative
- Potential Parking Area

Boundary Information

- BLM Leased Land
- California State Parks Land
- Potential Acquisiton Site

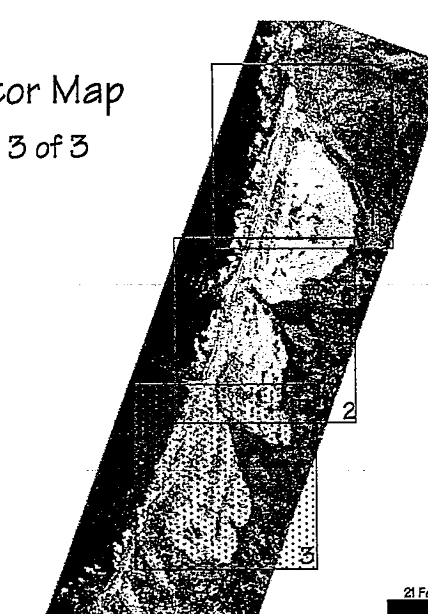
Haul Road

- Existing
- Completely Washed Out[1]
- Severely Damaged[1]

Footnotes: [1] Based on GPS data collected during July 1999

Sources: Digital Orthophotography - Department of Parks and Recreation, 1999; Biological Information - EDAW, Inc.; MacKerricher State Park General Plan, June 1995.

Locator Map
Map 3 of 3



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5.3 HAUL ROAD ALTERNATIVE (PROPOSED PROJECT)

This alternative, which corresponds to the proposed project as identified in the ISTEA grant proposal, would include a trail aligned as closely as possible with the former haul road. This would require approximately 5,900 feet of new trail construction in the washout and damaged area south of Inglenook Fen. Because the beach is retreating in this area and attempts to reconstruct the haul road have failed, the trail alignment would be moved slightly inland to reduce the immediate erosion threat. This alternative would also require surface treatment of a maximum of 14,000 feet of existing pavement, which may include repair of potholes, some resurfacing, and sand removal. Trail construction and development of a parking area could occur in the vicinity of the Ten Mile River Bridge to provide formalized access to the northern end of the Preserve.

THREATENED AND ENDANGERED SPECIES

There are numerous occurrences of Menzies' wallflower and Howell's spineflower adjacent to the haul road between Ward Avenue and Ten Mile River. In addition, suitable habitat for these species occurs along most of the haul road in this area. Table 5.3-1 presents the number of linear feet of trail that would intersect suitable habitat for listed plant species. New trail construction in the washout and damaged sections of the haul road would intersect approximately 5,140 linear feet, while existing trail surfaces to be repaired and maintained would intersect approximately 3,230 linear feet of suitable habitat.

Table 5.3-1
Haul Road Alternative: Linear Feet of Trail Adjacent to Suitable Habitat for Listed Species

Species	New Trail	Existing Trail	Total Trail
Listed Plants	5,138	3,234	8,372
Western Snowy Plover	4,022	137	4,159

New trail construction would likely require extensive disturbance of the foredunes in the vicinity of the washout during construction. Howell's spineflower and Menzies' wallflower may occur from direct loss of dune habitat where trail construction occurs, damage caused by construction vehicles, and movement of earth during grading of the trail. Trail construction may also indirectly affect listed plants by stabilizing the foredunes. This may result in further accumulation of sand on the seaward side of the trail and facilitate the spread of non-native European beachgrass. Howell's spineflower does not compete well with other species and is more suited to open habitats maintained by sand movement. Consequently, it may suffer if the natural dune processes are stabilized and European beachgrass density increases (Pasquinelli 1998). Menzies' wallflower is also likely to be adversely affected by alteration of the natural dune processes and an increase in density of European beachgrass. Sand removal, repair to existing trail surfaces, and future trail maintenance may have additional impacts. These direct and indirect impacts are expected to be substantial and mitigation

would likely be difficult. Potential mitigation options are likely to be limited to avoidance measures, habitat restoration (e.g., removal of invasive non-native species), and minimization of indirect impacts (e.g., restricting visitor use in areas of occupied habitat).

If take of the two listed plant species cannot be avoided or effectively mitigated, the potential exists that USFWS and/or CDFG would conclude that the project would jeopardize the continued existence of these species. The potential of a jeopardy opinion is a particular concern for Howell's spineflower, because the study area supports a substantial portion of the only known population of the species. Consequently, potential impacts to listed plants and the potential regulatory response to these impacts threaten the feasibility of the Haul Road Alternative.

Suitable snowy plover nesting habitat is present along much of the beach adjacent to the existing haul road and on both sides of the washout and damaged sections. In some areas, washout of the haul road has expanded the available suitable nesting habitat into the foredunes. Reconstruction of the haul road may affect suitability of this area for nesting snowy plovers. New trail construction would intersect approximately 4,000 linear feet of currently suitable nesting habitat, while existing trail surfaces to be repaired and maintained would intersect approximately 140 linear feet (Table 5.3-1). Suitable snowy plover nesting and wintering habitat also occurs between the beach and foredunes along most of the haul road from Ten Mile River to Fen Creek. This area is currently used as wintering habitat, with as many as 23 individuals recorded on a single survey date, but the haul road does not intersect this habitat.

Trail construction may have direct adverse effects on snowy plovers as a result of the loss of potential nesting and wintering habitat. In addition, plovers may be disturbed by trail construction activities, increased visitor use associated with a developed trail, and repair and maintenance activities. A developed trail behind the foredunes would allow volunteer trails to the beach to be established, so increased human disturbance of plovers using the beach could result. Indirect impacts to plovers could also result from trail construction, repair, and maintenance of existing surfaces in areas designated as potentially suitable nesting habitat, because the trail could reduce the effectiveness of future habitat restoration efforts (R. LeValley, pers. comm., 2000). Although trail construction may result in indirect and direct impacts, the study area is not designated as critical habitat for western snowy plovers. In addition, no snowy plover are known to have recently used the study area for nesting. Therefore, it is likely that indirect impacts from disturbance could be mitigated (e.g., removal of beachgrass). Consequently, potential impacts to snowy plovers are not expected to threaten the feasibility of the Haul Road Alternative.

WETLANDS

Potential jurisdictional wetlands occur along most of the east side of the haul road. However, in most cases, they are set back to the east of the haul road by at least 100 feet. New trail construction would not be expected to substantially disturb wetlands. The trail would encounter 415 linear feet of wetland native shrubs adjacent to the existing trail, just west of the Ten Mile River Bridge (Table 5.3-2). Any wetland habitat impact could likely be offset by mitigation. Consequently, impacts to wetlands are not expected to affect the feasibility of the Haul Road Alternative.

Table 5.3-2
Haul Road Alternative: Linear Feet of Trail Adjacent to Wetlands

Class	New Trail	Existing Trail	Total Trail
Open Water	0	0	0
Wetland Introduced Grasses	0	0	0
Wetland Native Herbs	0	0	0
Wetland Native Shrubs	0	415	415
Wetland Native Trees	0	0	0
Total Wetlands	0	415	415

DYNAMIC COASTAL DUNE ENVIRONMENT

The haul road has affected sand transport rates from the beach and foredune to areas east of the road. This is most apparent at the north end of the proposed alignment in the lee of the broad turn coming out of Ten Mile River. In this section, the road appears to have locally starved some areas of sand for many decades. Elsewhere, European beachgrass appears to have had substantially greater effects on reducing sand flux across the road alignment than has the road itself. In the southern section, much of the haul road has been completely destroyed by wave action and coastal retreat since the early 1980s. There has been historic coastal erosion and retreat in this section since 1952. The northern part of the washout is separated from the beach by a very low, subdued ridge and has been subject to extensive and repeated overwash and surge flow during storm events, as well as flooding and berm breaching by outflowing flood waters. The southern part has experienced significant coastal retreat and is subject to localized overwash and locally high rates of aeolian sand transport.

Measurements and analysis of historic aerial photos suggest there is no immediate threat of beach erosion removing the haul road north of Fen Creek. High rates of sediment transport from the Ten Mile River may actually be adding to beach stability (through local accretion) along this section of the coastline. In fact, the northern section of the coastline has shown both short term and long term beach accretion (widening) during the period of record. However, aeolian sand transport across the northern section of the road is locally significant and can be expected to result in continuing maintenance requirements to keep the trail free of excessive sand deposits.

The expected impacts in the southern section of the Haul Road Alternative are mostly the risk of damage to the trail, rather than impacts that the trail might have on the natural environment. If the trail is properly constructed to follow the natural topography and to minimize its wind profile, it is not likely to seriously impede aeolian processes and long-term dune formation. However, beach and dune processes along this alignment are expected to have substantial risk of damage to or destruction of the trail. Although a trail could be constructed along this alignment, the majority of the southern section might be damaged in any future storm season; based on distance from the beach, the trail

should remain intact for one to five years, or more, but it is unlikely that it could be permanently maintained without having to relocate and reconstruct sections when they eventually succumb to wave attack or are damaged by ocean overwash. Coastal processes are difficult to predict, but historical documentation has demonstrated substantial coastal retreat and storm wave action along portions of the washout over the last 15 years. As with the northern section, portions of the trail are likely to be periodically buried by windblown sand. Annual (or more frequent) maintenance would likely be required to keep the trail open. Although construction and maintenance of this alternative could be conducted, the likelihood of substantial damage to or destruction of the southern section and resulting repair requirements threaten the feasibility of the Haul Road Alternative.

CULTURAL RESOURCES

There are several known archaeological sites adjacent to the Haul Road Alternative, including three in the vicinity of new trail construction. These sites are potentially eligible for inclusion in the National Register of Historic Places and the California Register of Historical Resources, though it is expected that significant impacts to these sites could be avoided with mitigation measures and by careful placement of the trail.

DPR POLICIES AND PRC PROVISIONS

Measures intended to provide protection for the natural and cultural resources in the study areas are included in both the PRC and the MacKerricher State Park General Plan. Much of the study area is designated as a natural preserve, as defined in the PRC. Under the PRC, habitat manipulation in a natural preserve is permitted only "in those areas found by scientific analysis to require manipulation to preserve the species or associations which constitute the basis for the establishment of the nature preserve." The Resource Element and Land Use Elements of the General Plan also includes measure intended to protect the resources within the study area. In some instances, DPR policies and PRC provisions to protect resources are in conflict with other provisions in the PRC and General Plan that focus on trail improvement and coastal access. Other PRC and General Plan policies are ambiguous and are open to different interpretations. Conflicting and ambiguous policies and provisions will need to be resolved by DPR, which has the responsibility of balancing resources protection and recreational opportunities for park users.

GENERAL COST REASONABLENESS

Initial construction and repair associated with the Haul Road Alternative would be costly due to the large amount of new trail construction. The original grant application was based on approximately this alignment, although additional trail has washed out since the grant application was submitted. However, the original grant application did not include funding for the frequent repair that is anticipated with this alternative. Reconstructed portions of the haul road are expected to require extensive repair, relocation, and/or reconstruction over time as a result of wave action and coastal erosion. The costs associated with these repairs would be substantial and threaten the feasibility of the Haul Road Alternative.

5.4 SETBACK ALTERNATIVE

The Setback Alternative would include a trail primarily aligned on remaining parts of the haul road, and incorporating a bypass trail across the dunes east of the washout area. This bypass would require approximately 6,400 feet of new trail construction diverging from the haul road just north of Ward Avenue and reconnecting just south of Inglenook Fen. The intent of the Setback Alternative is to reduce this risk of storm wave and coastal erosion damage by moving the trail away from the beach. Surface treatment of the remaining approximately 14,000 feet of existing pavement would be required, which may include repair of potholes, some resurfacing, and sand removal. A trail and parking area could also be constructed in the vicinity of the Ten Mile River Bridge to provide formalized access to the northern end of the study area.

THREATENED AND ENDANGERED SPECIES

Impacts to Howell's spineflower and Menzies' wallflower from this alignment are expected to be similar to those associated with the Haul Road Alternative. Although the bypass segment would be set back east of the former haul road alignment, it would also be constructed through suitable habitat for the listed plants. New trail construction and existing surfaces to be repaired and maintained would each intersect approximately 3,230 feet of suitable habitat (Table 5.4-1). New trail construction would likely require extensive disturbance of the dunes during construction. Take of habitat for listed plants would occur from damage caused by construction vehicles and movement of earth during grading of the trail. Trail construction may also indirectly affect listed plants by stabilizing the foredunes. Sand removal, repair to existing trail surfaces, and future trail maintenance may have additional impacts. These direct and indirect impacts are expected to be substantial and mitigation opportunities are limited. Consequently, the potential exists that USFWS and/or CDFG would conclude that this alternative would jeopardize the continued existence of these species. Therefore, impacts to listed plants and the potential regulatory response to those impacts threaten the feasibility of the Setback Alternative.

Table 5.4-1
Setback Alternative: Linear Feet of Trail Adjacent to Suitable Habitat for Listed Species

Species	New Trail	Existing Trail	Total Trail
Listed Plants	3,230	3,234	6,464
Western Snowy Plover	400	137	537

The bypass would avoid most of the suitable snowy plover nesting habitat along the washout and damaged sections, but new trail construction would intersect approximately 400 linear feet of potential nesting habitat just south of Fen Creek (Table 5.3-1). Suitable nesting and wintering habitat also occurs between the beach and foredunes along most of the haul road from Ten Mile River to Fen Creek, but the the haul road does not intersect this habitat. Trail construction may have direct

adverse effects on snowy plovers resulting from the loss of potential nesting habitat. In addition, plovers may be impacted by disturbance from trail construction activities, increased visitor use associated with a developed trail, and repair and maintenance activities (Pasquinelli 1998). However, it is likely that these impacts could be mitigated (e.g., removal of beachgrass). Consequently, potential impacts to snowy plovers are not expected to threaten the feasibility of the Setback Alternative.

WETLANDS

As with the Haul Road Alternative, the Setback Alternative would encounter wetlands just west of the Ten Mile River Bridge and at the mouths of Inglenook and Fen creeks. In addition, the bypass segment would encounter seasonal wetlands in the dunes. New trail construction would intersect approximately 780 linear feet of wetland native herbs, while existing trail surfaces to be repaired and maintained would intersect approximately 420 linear feet of wetland native shrubs (Table 5.4-2). Due to the widespread distribution of seasonal wetlands along the bypass alignment, avoiding wetlands is not possible and impacts are expected to be significant and may be unavoidable. Substantial, unavoidable wetlands impacts could threaten the feasibility of the Setback Alternative, because of the extent and cost of mitigation to minimize harm and the potential to conflict with state or federal policies intended to protect wetland habitats. Compliance with Executive.Order. 11990 may be possible for the Setback Alternative, if the haul road is found to not be "practicable" (such as for wave action reasons) and substantial measures to minimize harm to wetlands are included. The extent and cost of mitigation may become the primary factor threatening feasibility.

Table 5.4-2
Setback Alternative: Linear Feet of Trail Adjacent to Wetlands

Class	New Trail	Existing Trail	Total Trail
Open Water	0	0	0
Wetland Introduced Grasses	0	0	0
Wetland Native Herbs	779	0	779
Wetland Native Shrubs	0	415	415
Wetland Native Trees	0	0	0
Total Wetlands	779	415	1194

DYNAMIC COASTAL DUNE ENVIRONMENT

Potential impacts related to the existing trail surfaces north of the washout are the same as those discussed for the Haul Road Alternative. Measurements and analysis of historic aerial photos suggest there is no immediate threat of beach erosion removing the haul road north of Fen Creek. However, aeolian sand transport across the northern section of the road is locally significant and can be expected to result in continuing maintenance requirements to keep the trail free of excessive sand deposits. New trail bypass set back from the beach passes through a much "tamer" geologic

environment than the southern section of the Haul Road Alignment, which it is designed to bypass. For the most part, the bypass segment avoids contact with beach processes and coastal erosion. The one exception is where the north end of the bypass rejoins the haul road south of Fen Creek; beach erosion has recently occurred in close proximity to the haul road. This portion of the bypass traverses low elevation vegetated dunes, vegetated deflation hollows, and the lee slopes of actively moving transverse dunes. The lee side of active transverse dunes is typified by wind erosion and long-term removal and export of windblown sand.

It is not expected that new trail construction would have a serious, irreversible impact on the natural dune processes operating along the Setback Alternative route. However, where the Setback Alternative crosses open sand on the lee side of the transverse dunes, the hardened trail would likely be undercut by continued wind erosion. Portions of this section of the trail would likely require regular maintenance to keep the trail relatively free of sand. The trail alignment could be locally routed to take it along the boundary between the deflation terrain to the west and the trailing edge of the transverse dune to the east. This would result in a minimum of sand deposition and sand erosion, while still avoiding regular or extended inundation during periods of flooding in the deflation hollows, thereby reducing maintenance costs and/or rebuilding requirements, compared to the Haul Road Alternative. In the long term, perhaps over 20 years, dune processes and sand movement may require rerouting portions of the Setback Alternative where burial or erosion becomes a continuing problem. Although maintenance costs may be substantial, the issue of dune instability does not appear to threaten feasibility of the Setback Alternative.

CULTURAL RESOURCES

There are several known archaeological sites adjacent to the Setback Alternative, including three in close proximity to the bypass segment. These sites are potentially eligible for inclusion in the National Register of Historic Places and the California Register of Historical Resources, although it is expected that significant impacts to these sites could be avoided and/or mitigated.

DPR POLICIES AND PRC PROVISIONS

Construction of the bypass segment of the Setback Alternative may be in conflict with several directives in the Resource Element of the General Plan (1995), including the perpetuation of listed plants and avoidance of trails through wetland areas. It would also conflict with the Land Use Element goal to protect MacKerricher State Park's sensitive resources, including restriction of access to the dunes. It is the responsibility of DPR to determine whether these conflicts threaten the feasibility of this alternative

GENERAL COST REASONABLENESS

The Setback Alternative is expected to be costly due to the amount of new trail construction through the dunes. However, maintenance costs would be less than those of the Haul Road Alternative, because the trail alignment could be routed in a manner that would minimize sand erosion and deposition and avoid deflation hollows that are subject regular flooding. Consequently, costs

associated with construction, repair, and maintenance are not expected to threaten feasibility of the Setback Alternative.

5.5 SHORTCUT ALTERNATIVE

The Shortcut Alternative includes a trail connection from the haul road, south of the washout, directly to Highway 1, and then north along the Park boundary on the west side of Highway 1 for approximately 1 mile, where the boundary veers away from the highway and the trail ends. The trail would require approximately 9,500 feet of new construction to complete the segment between the haul road and Highway 1. A substantial amount of the new trail construction would cross the dunes. The intent of the Shortcut Alternative is to avoid as much as possible the resources of the Preserve, while still connecting the coastal trail to Highway 1. A parking area to accommodate 15 to 20 vehicles would be developed where the trail meets Highway 1 at the southeast corner of the study area. Surface treatment of the approximately 1,200 feet of existing pavement from Ward Avenue to the washout would be required, which may include repair of potholes, some resurfacing, and sand removal.

THREATENED AND ENDANGERED SPECIES

The section of the haul road between Ward Avenue and the washout is adjacent to high concentrations of listed plants. The segment between the haul road and Highway 1 would be constructed through suitable listed plant habitat. New trail construction would intersect approximately 1,700 linear feet, while existing trail surfaces that would be repaired and maintained, would intersect approximately 1,050 linear feet (Table 5.5-1). New trail construction would likely require extensive disturbance of the dunes during construction. Potential impacts to listed plants include damage caused by construction vehicles, and movement of earth during grading of the trail. Trail construction may also impact listed plants through alteration of the natural dune processes and by promoting the spread of European beachgrass. Sand removal, repair to existing trail surfaces, and future trail maintenance may have additional impacts. These direct and indirect impacts are expected to be substantial and fully mitigating these impacts would be difficult. Consequently, this alternative could result in jeopardy opinion being issued by CDFG and/or USFWS. Therefore, impacts to threatened plants and the potential regulatory response to those impacts threaten the feasibility of the Shortcut Alternative.

No snowy plover nesting habitat would be encountered by this alternative.

Table 5.5-1
Shortcut Alternative: Linear Feet of Trail Adjacent to Suitable Habitat for Listed Species

Species	New Trail	Existing Trail	Total Trail
Listed Plants	1,702	1,051	2,753
Western Snowy Plover	0	0	0

WETLANDS

This alternative would encounter wetlands and riparian habitat in numerous locations between the haul road and Highway 1 and would require construction of a creek crossing just west of the parking area. New trail construction would intersect approximately 1,180 linear feet of wetland native herbs and shrubs (Table 5.5-2). Due to the widespread distribution of seasonal wetlands in the hinddunes, impacts are expected to be significant and may be unavoidable. Substantial, unavoidable wetlands impacts could threaten the feasibility of the alternative, because of the extent and cost of mitigation and conflicts with state and federal policies intended to protect wetlands.

Table 5.5-2
Shortcut Alternative: Linear Feet of Trail Adjacent to Wetlands

Class	New Trail	Existing Trail	Total Trail
Open Water	0	0	0
Wetland Introduced Grasses	0	0	0
Wetland Native Herbs	402	0	402
Wetland Native Shrubs	774	0	774
Wetland Native Trees	0	0	0
Total Wetlands	1176	0	1176

DYNAMIC COASTAL DUNE ENVIRONMENT

The Shortcut Alternative's departure from the haul road prior to the washout minimizes potential impacts associated with coastal erosion and shoreline retreat. This alternative traverses low elevation vegetated dunes (especially near the beginning of the route), several short sections of vegetated deflation hollows, lee slopes of broad, actively moving transverse dunes, fronts of two moderately defined, small transverse dunes and the long, steep slip face of the main precipitation ridge. In the two places where the trail crosses through low elevation deflation hollows it would have to be routed to minimize the possibility of flooding. In addition, one section of deflation hollow would likely have to be bridged.

The Shortcut Alternative is not expected to have a serious, irreversible impact on the natural dune processes along the proposed alignment. If the trail were properly constructed to minimize its wind profile, it would not be likely to seriously impede aeolian processes or affect long-term dune formation. The trail may, in fact operate for several years without experiencing significant damage. However, a hardened trail that crosses active deflation areas and several transverse dune fronts can be expected to experience significant and repeated damage over the long term. In addition, construction across the final precipitation ridge would be problematic, due to the steepness of the slip face, the length of the steep slope, the nature of the material (loose sand), and the likelihood that the slip face will become more active at some time in the future. The trail may eventually become

covered as the dune advances in response to future sand movement. Consequently, it would eventually and periodically have to be moved and rebuilt to accommodate the unavoidable movement of the slip face, perhaps as frequently as every 5 years. Although construction and maintenance of this alternative could be conducted, construction difficulties and the likelihood of significant and repeated damage would be substantial. Repairs to trail would be required more frequently than those associated with the Setback Alternative. These difficulties and resultant costs threaten the feasibility of the Shortcut Alternative.

CULTURAL RESOURCES

There are several known archaeological sites adjacent to the Shortcut Alternative, including one site in close proximity to new trail construction. These sites are potentially eligible for inclusion in the National Register of Historic Places and the California Register of Historical Resources, though it is expected that significant impacts to these sites could be avoided or mitigated

PRC AND DPR POLICIES AND PROVISIONS

Construction of the Shortcut Alternative segment from the haul road to Highway 1 may be in conflict with several directives in the Resource Element of the General Plan (1995), including the perpetuation of listed plants and avoidance of trails through wetland areas. It would also conflict with the Land Use Element goal to protect MacKerricher State Park's sensitive resources, including restriction of access to the dunes, whether or not these conflicts threaten the feasibility of this alternative will be determined by DPR.

GENERAL COST REASONABLENESS

New trail construction would require grading in the hinddunes as well as construction of structures that bridge wetland in numerous areas. Structures would also be needed to bridge steep slopes to avoid extensive grading. Also, periodic repair or reconstruction is likely near the final precipitation ridge. As a result, it is expected to be very high-cost and may substantially exceed the amount of funding currently available, thereby threatening feasibility of the Shortcut Alternative.

5.6 NORTHERN ALTERNATIVE

The Northern Alternative would include repairing a segment of the northern portion of the haul road. A parking area would be developed south of the Ten Mile River Bridge, on either the west or east side of the highway, and a trail would be constructed to connect the parking area to the haul road. If the parking area were on the west side, a trail of approximately 1,300 feet would run along the highway and diverge from the highway just south of the bridge to connect with the haul road. If it were on the east side of the highway, a trail of approximately 2,300 feet would connect to the extension of the haul road that runs along Ten Mile River. The main trail would follow the alignment of the haul road from the Ten Mile River Bridge to a point, to be determined later, north of the washout. This segment would require surface treatment of up to 13,000 feet of existing pavement, which may include repair of potholes, some resurfacing, and sand removal.

THREATENED AND ENDANGERED SPECIES

This alternative would encounter concentrations of Howell's spineflower and Menzies' wallflower along the existing haul road between the Ten Mile Bridge and where the haul road curves to the south. Existing trail surfaces to be repaired and maintained would be adjacent to approximately 2,180 linear feet of suitable habitat (Table 5.6-1), although no new trail construction would occur in suitable habitat. Sand removal, repair to existing trail surfaces, and future trail maintenance may impact listed species. However, it is expected that these impacts could be mitigated. Potential mitigation would include use of signage to deter park visitors from entering sensitive habitat and identifying sensitive plant populations prior to commencing maintenance activities.

Table 5.6-1
Northern Alternative: Linear Feet of Trail Adjacent to Suitable Habitat for Listed Species

Species	New Trail	Existing Trail	Total Trail
Listed Plants	0	2,183	2,183
Western Snowy Plover	0	0	0

Suitable snowy plover nesting and wintering habitat occurs between the beach and foredunes along most of the haul road from Ten Mile River to Fen Creek, but the haul road does not intersect this habitat. Consequently, no snowy plover nesting habitat would be directly affected by this alternative. A developed trail could result in indirect impacts by allowing volunteer trails to the beach to be established at almost any location. However, it is expected that these impacts could be mitigated. Potential impacts to snowy plovers would not threaten the feasibility of the Northern Alternative.

WETLANDS

This alternative would encounter wetlands just west of Ten Mile River Bridge. Existing trail surfaces to be repaired and maintained would be adjacent to 415 linear feet of wetland native shrubs in this area (Table 5.6-2). Wetlands adjacent to the existing trail would be be substantially affected by construction or maintenance activities. No new trail construction would encounter wetland habitat. Consequently, impacts to wetlands are not expected to affect the feasibility of the Northern Alternative.

Table 5.6-2
Northern Alternative: Linear Feet of Trail Adjacent to Wetlands

Class	New Trail	Existing Trail	Total Trail
Open Water	0	0	0
Wetland Introduced Grasses	0	0	0
Wetland Native Herbs	0	0	0
Wetland Native Shrubs	0	415	415
Wetland Native Trees	0	0	0
Total Wetlands	0	415	415

DYNAMIC COASTAL DUNE ENVIRONMENT

Potential impacts to and from existing trail surfaces are the same as those discussed for the Haul Road Alternative. Measurements and analysis of historic aerial photos suggest there is no immediate threat of beach erosion removing the haul road north of Fen Creek. Aeolian sand transport across the northern section of the road is locally significant and can be expected to result in continuing maintenance requirements to keep the trail free of excessive sand deposits. However, this does not threaten feasibility of the Northern Alternative.

CULTURAL RESOURCES

There are several known archaeological sites in proximity of the Northern Alternative that are potentially eligible for inclusion in the National Register of Historic Places and the California Register of Historical Resources. However, because there is no new trail construction for this alternative and the sites are not adjacent to the haul road, impacts to these sites are not expected.

PRC AND DPR POLICIES AND PROVISIONS

Implementation of the Northern Alternative could increase visitor use in the northern portion of the Preserve. This could conflict with policies and provisions of the General Plan and PRC. However, these conflicts would be minimized through implementation of mitigation measures that would protect sensitive natural and cultural resources.

GENERAL COST REASONABLENESS

Development of the parking area and trail connecting to the haul road would be high-cost, though repair of existing surfaces along the remainder of the trail would be relatively low cost. Therefore, the Northern Alternative is not expected to substantially exceed the amount of funding currently available.

6 STUDY CONCLUSIONS AND SUBSEQUENT ACTIONS

6.1 FEASIBILITY CONCLUSIONS

The conclusions of this feasibility study are discussed below. The numbering corresponds to the issues identified in the preceding discussion. Issues that are not expected to affect the feasibility of any of the proposed alternatives are noted below.

4.2-1: COMPLIANCE WITH SECTION 404 OF THE CLEAN WATER ACT

4.4-1: COMPLIANCE WITH SECTION 106 OF THE NATIONAL HISTORIC PRESERVATION ACT

4.5-1: CONSISTENCY WITH STATUTORY GENERAL PLAN POLICIES AND PROVISIONS

ISSUE 4.1-1 CONCLUSION

ESA COMPLIANCE. **The feasibility of the project would be threatened if DPR proceeded with the Haul Road, Setback, or Shortcut Alternative, due to impacts to two listed plants and the resulting potential for a jeopardy opinion under ESA. In the event of a jeopardy opinion, DPR may not be eligible for federal funding. Compliance with ESA would not be expected to affect the feasibility of the Northern Alternative or the Ward Avenue Terminus Alternative.**

Because the project has the potential for take of listed species, DPR would need to consult with USFWS under ESA before proceeding with any of the proposed alternatives. Federally listed species that could be affected include western snowy plover, Howell's spineflower, and Menzies' wallflower. Impacts to western snowy plover are not expected to threaten the feasibility of the project because impacts could be avoided, minimized, and mitigated to a large extent. Likewise, impacts to federally-listed species resulting from implementation of the Northern or Ward Avenue Terminus Alternative could likely be avoided, minimized, and/or mitigated, because these alternatives would not include new trail construction in habitat suitable for listed species.

If implementation of the Haul Road, Setback, or Shortcut Alternative proceeds, impacts to Howell's spineflower and Menzies' wallflower would be substantial. The primary impact would result from new trail construction in suitable habitat. Repair of existing trail would also impact Howell's spineflower and Menzies' wallflower because both species are known to occur at several locations immediately adjacent to existing portions of the trail. Post-construction impacts (e.g., trampling by pedestrians, etc.) would also be expected. How is that different from now?

USFWS has expressed concerns regarding potential impacts associated with construction of a trail through the dunes (USFWS, April, 1998; USFWS, October, 1998; USFWS, July, 1999). Furthermore, USFWS has determined any alignment through the Preserve would result in impacts to federally

listed species and that there are limited opportunities for mitigating potential impacts (USFWS, October, 1998). USFWS has also concluded that impacts to Howell's spineflower could result in a jeopardy opinion (USFWS 1998). In a letter to DPR Superintendent Greg Picard, dated October 1, 1998, USFWS stated that "impacts on federally listed species from developing a trail north of Ward Avenue have been clearly stated and are severe, including possible extinction of Howell's spineflower."

It is not certain that implementation of the proposed project would ultimately lead to the extinction of Howell's spineflower or any other federally-listed species in the Preserve; however, it is clear that impacts to Howell's spineflower and Menzies' wallflower would be significant and that fully mitigating those impacts may not be possible. Protection of habitat for Howell's spineflower would be particularly difficult to mitigate given that a substantial portion of this species' entire range is within the Preserve. Therefore, it is possible that USFWS would issue a jeopardy opinion for Howell's spineflower for any project that included new trail construction through suitable habitat. If a jeopardy opinion were issued, the project would not be expected to be eligible for federal funding. Therefore, the Haul Road, Setback, and Shortcut Alternatives do not appear to be feasible, based on the potential for a USFWS jeopardy opinion.

ISSUE
4.1-2
CONCLUSION

CESA COMPLIANCE. **The feasibility of the project would be threatened if DPR proceeded with the Haul Road, Setback, or Shortcut Alternative due to impacts to listed plants and the resulting potential for a jeopardy opinion under CESA. In the event of a jeopardy opinion, DPR may not be eligible for federal funding. Compliance with CESA would not be expected to affect the feasibility of the Northern Alternative or the Ward Avenue Terminus Alternative.**

As discussed above, if implementation of the Haul Road, Setback, or Shortcut alternative proceeds, impacts to Howell's spineflower and Menzies' wallflower would be substantial. Howell's spineflower and Menzies' wallflower are state-listed as Threatened and Endangered, respectively. CDFG has expressed similar concerns to those of USFWS regarding potential impacts to listed plants and the effects of the project on the dunes that provide habitat for these species. In a letter to DPR Associate Parks and Recreation Specialist Gary Shannon, dated June 10, 1998, CDFG stated that "the entire range of Howell's spineflower coincides with the proposed Coastal Trail; therefore, it is likely that the proposed project would jeopardize the continued existence of that species." In addition to direct impacts associated with new trail construction, CDFG is also concerned about indirect impacts, including potential effects on dune habitat resulting from the physical presence of a road in the dunes (i.e., dune stabilization). Based on the potential for a CDFG jeopardy opinion, the Haul Road, Setback, and Shortcut alternatives do not appear feasible.

ISSUE
4.2-2
CONCLUSION

EXECUTIVE ORDER 11990. **Compliance with Executive Order 11990 could threaten the feasibility of the Setback Alternative and the Shortcut Alternative. For either alternative, compliance with Executive Order 11990 may be possible if it determined that the alternative would have the least amount of wetland impact among the practicable alternatives. If compliance with Executive Order 11990 can be achieved, the extent and cost of mitigation could threaten the feasibility of either alternative. Compliance with Executive Order 11990 would not be expected to affect the feasibility of the Haul Road Alternative, Northern Alternative, or Ward Avenue Terminus Alternative.**

If DPR proceeds with the Setback Alternative, a substantial amount of wetland habitat could be affected. Due to the widespread distribution of seasonal wetlands in the bypass segment, avoiding wetlands is not possible and impacts are expected to be substantial. Substantial, unavoidable wetlands impacts could threaten the feasibility of this alternative, because of the extent and cost of mitigation to minimize loss and disturbance of wetlands, and the potential to conflict with E.O. 11990 and other state and federal statues (e.g., Section 404 of the Clean Water Act).

Proceeding with the Shortcut Alternative would be problematic because wetland and riparian habitat is present at numerous locations between the haul road and Highway 1. Due to the widespread distribution of seasonal wetlands in the hinddunes, impacts are expected to be substantial and may be unavoidable. As with the Setback Alternative, substantial, unavoidable wetland impacts could threaten the feasibility of this alternative.

ISSUE
4.3-1
CONCLUSION

COASTAL EROSION AND DUNE INSTABILITY. **Although both the Haul Road Alternative and the Shortcut Alternative could be constructed, the feasibility of these alternatives is threatened because of anticipated damage and destruction related to natural coastal processes. Coastal erosion would threaten the feasibility of the Haul Road Alternative, and dune instability would threaten the feasibility of the Short-cut Alternative. Coastal erosion is not expected to affect the feasibility of the Setback Alternative, Northern Alternative, or Ward Avenue Terminus Alternative.**

If DPR proceeds with the Haul Road Alternative, the majority of the southern section of the trail would be at risk of future damage or destruction caused by wave attack and ocean overwash. Based on the distance from the beach, the trail should remain intact for one to five years, or more.

However, it is unlikely that that the trail could be permanently maintained without having to relocate and reconstruct sections that would eventually be damaged or destroyed during storms. The likelihood of substantial trail destruction and resulting repair requirements threaten the feasibility of this alternative.

If DPR proceeds with the Shortcut Alternative, using a hardened trail surface, substantial and repeated damage over the long term can be expected. In addition, construction across the final precipitation ridge would be problematic due to the steepness of the slope and dune instability. Consequently, the trail would eventually and periodically have to be moved and rebuilt to accommodate the unavoidable movement of the dunes, perhaps as frequently as every 5 years. The difficulties presented by constructing a trail in an extremely unstable dune environment and resultant costs of construction and repair could threaten the feasibility of this alternative.

ISSUE
4.6-1
CONCLUSION

POTENTIAL FOR PROJECT TO EXCEED AVAILABLE FUNDING. **The feasibility of the project would be threatened if DPR proceeded with the Haul Road Alternative or the Shortcut Alternative due to the potential for these alternatives to substantially exceed the amount of funding currently available. The costs associated with completing the Setback Alternative, the Northern Alternative or the Ward Avenue Terminus Alternative would not threaten the feasibility of the project.**

The original grant application was based on the Haul Road Alternative. Funding provided by the grant would likely cover the cost of construction for this alternative. However, the original grant application for the Haul Road Alternative did not include funding for the frequent repair of the southern section of the trail that would be needed after project construction. Substantial damage to the trail is anticipated to occur in less than five-year intervals. In addition, the amount of new trail construction would be higher than originally anticipated because of recent washouts. The combined costs associated with new trail construction and repair of sections of the haul road damaged by storms would likely exceed the currently allotted funding by a substantial amount.

If DPR proceeds with the Shortcut Alternative, using a hardened surface trail, significant and repeated damage over the long term can be anticipated to occur in active deflation areas and areas that cross transverse dune fronts. New trail construction would likely require construction of costly structures. Construction of long sections of raised boardwalk to minimize the need for extensive grading could also be costly. The combined costs of trial construction and trail repair would likely substantially exceed the currently allotted funding.

6.2 SUBSEQUENT ACTIONS

[To be completed after March 20th public / agency meetings]

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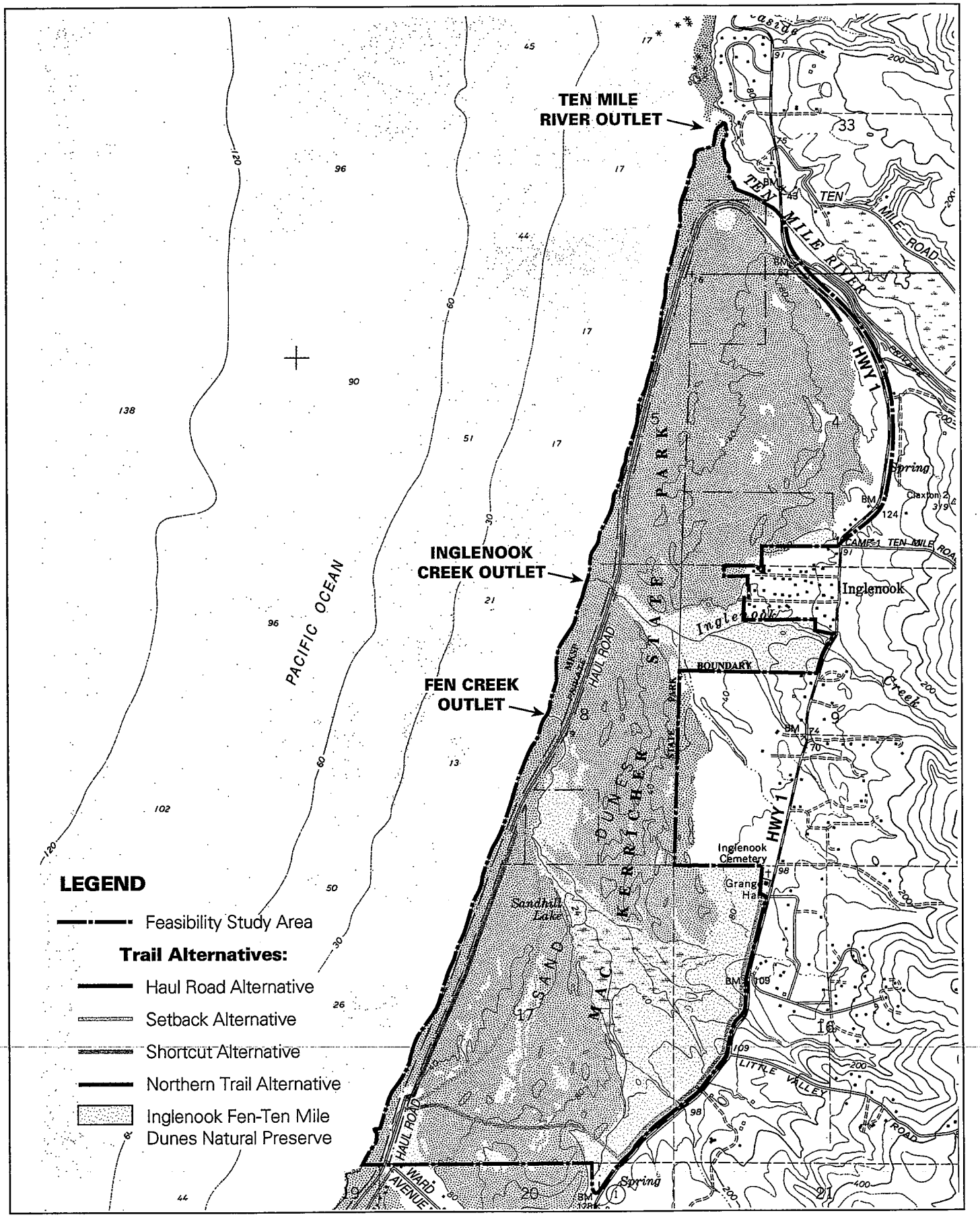

Study Area and Vicinity

MacKerricher Coastal Trail Project - Feasibility Study

0' 1000' 2000'

NORTH

EDAW