CHAPTER 7

ENVIRONMENTAL IMPACT REPORT

7.10 INTRODUCTION

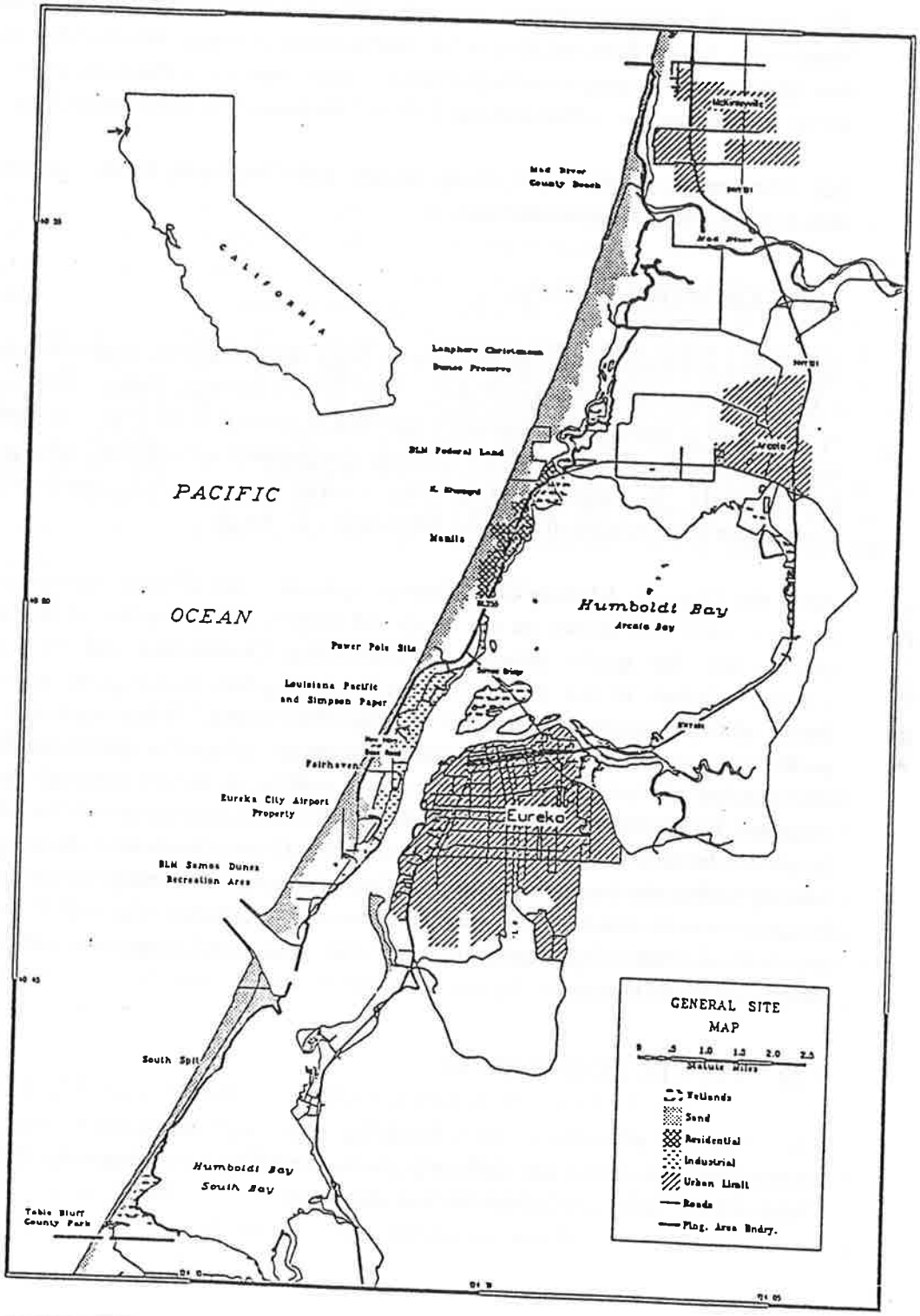
The purpose of this EIR is to determine the impacts associated with recreational use on the North and South Spits of Humboldt Bay. It is prepared in accordance with the requirements of the California Environmental Quality Act of 1970 (CEQA). Background information and analysis are provided within the balance of the Beach and Dunes Management Plan. While project specific impacts are included in the assessment, more detailed analysis may be necessary once the actual project is chosen.

The California Environmental Quality Act (CEQA) requires that all projects be evaluated to determine their effects on the environment. Although recreational use is generally not considered "development", it is recognized as having the potential to cause an adverse effect on the environment. If there are possible significant effects, an Environmental Impact Report (EIR) must be prepared. Among other things, an EIR:

Describes the project;
Analyzes its impacts on the environment;
Considers alternatives and ways to reduce impacts;
Allows for public review.

It has been determined that the Beach and Dunes Management Plan could potentially cause significant environmental effects, given the range of alternatives, and therefore an EIR is necessary. Within the EIR site specific impacts under each alternative are examined, as well as potential mitigation measures. It is intended to be useful to decision makers and the general public in determining the general effects of the full range of alternatives. See Chapter One for additional information.

Figure 7.20 A Location map



7.20 PROJECT DESCRIPTION

The project is a management plan to address issues associated with recreational use on the North and South Spits of Humboldt Bay through a range of alternatives. Further descriptions of the project as they relate to a particular environmental topic are found within their respective sections of this EIR and the balance of this Management Plan.

See Chapter 1, Section 1.30, Study Scope; and Chapter 6, North and South Spit Alternatives, for additional information.

7.21 ADOPTION PROCESS

The Beach and Dunes Management plan reflects the input from numerous meetings with a Citizens Advisory Committee (CAC). The Citizens Advisory Committee was appointed by the Board of Supervisors, and began meeting in December of 1989. The meetings were open to the public. The Committee reviewed the preliminary staff draft management plan (April, 1991), the alternatives, and the environmental analysis associated with the alternatives in assisting staff with the formulation of this plan.

After the Citizens Advisory Committee completed review of these documents, the plan which is otherwise known as the proposed project will be reviewed by the Planning Commission for public hearing. The Planning Commission will in turn add its recommendations to the plan, and forward them together with support materials to the Board of Supervisors of Humboldt County. The Board of Supervisors will also hold a public hearing, and will make the decision to adopt either the preferred alternative, a modification of the preferred alternative, or a different alternative than that originally proposed by the Committee. It is also likely that the alternative chosen for adoption will be an amendment to the Humboldt County Local Coastal Program. Following the public hearing before the Board of Supervisors, any proposed amendments of the Local Coastal Program would need to be submitted to the California Coastal Commission for certification. Following certification of the plan, implementation of the adopted alternative could proceed.

7.22 PROJECT OBJECTIVES

The plan was intended to be a feasibility study and management plan to address recreational use within the defined planning area. The adopted goal of the Beach and Dunes Citizen Advisory Committee was as follows:

> "The goal of the plan is to develop management programs and strategies to protect the natural resources of the planning area, to enhance and restore degraded portions, and to provide opportunities for recreation, research, and other activities that are compatible with maintenance of the integrity of the environment."

In order to accomplish the stated goal, a number of objectives were outlined. The initial objective of the Beach and Dunes Citizens Advisory Committee was to gather information. This information was gathered in conjunction with issue identification, for consideration in the development of management options. These options were then combined to provide a range of alternatives, and finally, a preferred alternative to provide the Committee concensus. The preferred alternative was chosen by the Committee at the meeting of June 16, 1992 Alternative #3 which essentially provided recreational driving south of the power pole site, was chosen as the Committee preferred alternative. At the following meeting of July 7, 1992 considerable public testimony was received by the Committee regarding their selection at the previous meeting of Alternative #3 as the preferred alternative. As a result, direction was made that Alternative #6 include a statement that would reflect the fact that this alternative was the preferred OHV alternative.

7.23 INTENDED USES OF THIS EIR

This document will act as an environmental document at an area-wide level. Some of the specific proposals in the alternatives may require project specific documents which could be included as part of the coastal development permit and/or environmental review process. Through the process of review it will be used by the Humboldt County Planning Commission, the Board of Supervisors, and the California Coastal Commission in considering proposed changes to the policies contained in the current LCP, which is the Humboldt Bay Area Plan. The Management Plan may be an amendment to the Humboldt Bay Area Plan which was adopted in 1983. It may also be used by the California Department of Fish and Game in reviewing future permits in the beach and dunes areas included in this plan.

7.24 EXISTING CONDITIONS AND PROPOSED PLAN

The majority of the Beach and Dunes study Area is planned Natural Resources. Land uses adjacent to its boundaries are more varied. Much of the Planning Area is essentially a peninsula, isolated on both sides by water; the ocean, and the bay. In the northern portion

it is more contiguous with the mainland, although the Mad River has also contributed to its penisuloid form. It is approximately 20 miles long, encompassing approximately 5,800 acres which is mostly zoned NR, with some PR, and adjacent industrial, residential, and agricultural zoning.

The planning area on the north spit is adjacent to the Samoa Pulp mills owned by Simpson and Louisiana Pacific, Sierra Pacific Industries, and the Community of Manila. It is also adjacent to agricultural uses and the Humboldt Bay National Wildlife Refuge. A more complete geographical description of the existing physical conditions can be found in Chapter two of the plan.

7.30 SUMMARY OF PROJECT ALTERNATIVES, EFFECTS, AND MITIGATION

The Beach and Dunes Management Plan approximately 5,800 acres, and 20 miles long. Please see Chapter two of the Beach and Dunes Management Plan for a description and overview of the planning area and the various land uses.

The following section provides a summary of each alternative. In addition, a section is provided which summarizes significant effects, proposed mitigation measures and alternatives which would reduce or avoid that effect. Please refer to the text of the DEIR for a full discussion of each issue as it relates to a particular alternative.

A. North Spit Alternative #1 - Implement LCP

This alternative is similar to a no project alternative. It reflects the existing policy of the Humboldt Bay Local Coastal Plan. It differs from a no project alternative in that it proposes implementing the existing policy of the LCP through adoption of an enforceable use ordinance. It also has more specific recommendations with respect to acquisition, restoration and protection projects.

B. North Spit Alternative #2 - Expansion of BLM/North Jetty Riding Area

This alternative is similar to Alternative #1 except for an expanded riding area which would include the primary foredune zone as far as the northern property line of the Eureka City Airport, and a vehicle free zone. For the most part it reflects the existing policy of the Humboldt Bay Local Coastal Plan, except for the vehicle free zone. It differs from Alternative #1 is that it proposes expanding the existing BLM riding area, which is allowed under the Humboldt Bay Local Coastal Plan, at the North Jetty, to include the foredune zone along the Eureka City Airport, and a vehicle free zone in front of Manila,

from the southern boundary of the Rudd property north to the southern boundary of the Khaloghli property, which would also be allowed under the current LCP.

C. North Spit Alternative #3 - Recreational Riding South of the Power Pole Site (Committee Preferred Alternative)

This alternative is similar to Alternative #2 except that it includes the foredune area north to the power pole site. For the most part it reflects the existing policy of the Humboldt Bay Local Coastal Plan, although it does allow for OHV use above the waveslope on the City of Eureka property and along New Navy Base Road to the power poles, and closes the rest of the beach to motorized vehicle traffic, including the waveslope.

D. North Spit Alternative #4 - LP OHV Riding Area

This alternative would define a recreational riding area bounded to the South by the LP Power Pole site and the Rudd property, now MCSD, and the Lundblade properties to the north and northeast. OHV use could be accommodated by developing a new public accessway specifically designated for vehicular staging at the LP ranch house site, or at the Power Poles access site off of New Navy Base Rd. Developing this area would provide an approximate maximum total of 140 acres of additional riding area, with approximately 33 acres of open sand. This alternative would include continued use of the BLM Jetty recreation area as it is currently managed. Except for these two areas, vehicular use would be limited to waveslope driving only at fifteen miles per hour for the rest of the planning area. Vehicle free zones adjacent to Manila and Lanphere-Christensen Preserve are possible sub-options. Pedestrian accessway improvements, enhancement and restoration projects would be carried out in the non-motorized use areas of the planning area. See Alternative #1 for impact discussion of these other areas.

E. North Spit Alternative #5 - Public OHV Riding on Khaloghli, BLM, LP, and Gun Club Parcels

This alternative proposes to make a public OHV use area bounded by the south by the Khaloghli property, and to the north by the open sand areas encompassed by the CMA. This discussion assumes to focus on this alternative as an isolated element, without inclusion of the sub-options. Within this defined area, currently there exists 95 acres of open sand, of the total 240 acres. This alternative would include continued use of the BLM Jetty recreation area as it is currently managed. These two areas would provide OHV riding opportunities above the waveslope. Vehicle free zones would be provided for in the vicinity of Manila and north of Mad River County Park. The rest of the planning area would provide waveslope driving only. See Alternative #1 for impact discussion of these other areas.

F. North Spit Alternative #6 - Privately Managed OHV Use on Khaloghli, BLM, LP, and the Gun Club Properties

This alternative proposes to make a privately managed OHV use area bounded by the south by the Khaloghli property, and to the north by the open sand areas encompassed by the CMA. Within the defined area, currently there exists 95 acres of open sand, of the total 240 acres. This alternative would include continued use of the BLM Jetty recreation area as it is currently managed. These two areas would provide OHV riding opportunities above the waveslope. Vehicle free zones would be provided for in the vicinity of Manila and north of Mad River County Park. The rest of the planning area would provide waveslope driving only.

G. South Spit Alternative #1: Waveslope Driving on the West Side and Controlled Access on the East Side (Committee Preferred Alternative)

This alternative would allow for waveslope driving on the west side of the County road bounded to the south by Table Bluff County Park and the South Jetty to the north. This would provide approximately four miles of waveslope driving for all recreational vehicle types, consistent with the existing local coastal program policy. One designated corridor currently exists at the base of Table Bluff County Park. Additional corridors from the road through the vegetated dunes to the waveslope would be established at various intervals. A speed limit of 15 mph. would be enforced for the area.

Vehicular access on the east side of the road under this alternative would be by special permission only, where necessary for hunting, gathering, wildlife field work, or traditional uses of the Wiyot tribe. Such vehicular access would need to be managed consistent with the management objectives of both the Wiyot Tribal Council and the Humboldt Bay National Wildlife Refuge. The east side of the road would be fenced with locked gates at access corridors. Vehicle turnouts and pedestrian access could be provided at designated corridors. Other vehicle restrictions may be warranted to effectively manage the area.

If management can be provided, camping facilities at the end of the South Spit would be developed, to be operated on a seasonal basis, managed consistent with habitat, safety, and jetty maintenance considerations. Initially the area would be managed for day use. Cost permitting, pedestrian accessway improvements, enhancement and restoration projects would be carried out on a site by site basis for the length of the South Spit.

H. South Spit Alternative #2: Recreational Driving on the West Side and Limited Access on the East Side

This alternative proposes that recreational driving be allowed on the west side of the County Road, in the foredune area. It differs from Alternative #1 in that it allows recreational vehicle use above the waveslope in the vegetated dunes from Table Bluff County Park north to the South Jetty area, providing approximately 400 acres of riding area. The east side of the road would be closed to recreational driving except for designated corridors for hunting and clamming access. Under this alternative no special permission would be required for vehicular access to the east side.

While the tip of the South Jetty is currently designated as Public Recreation in the current LCP, this would require an amendment to the Humboldt Bay LCP to include this additional portion of the South spit foredune area into this area of Public Recreation.

I. South Spit Alternative #3: Enhancement of Natural Resources

This alternative would prohibit OHV use on the South Spit from Table Bluff County Park north to the South Jetty. Impacts resulting from off road vehicle use would be substantially reduced to all dune habitats in this area. Vehicle use may increase in other areas as a result of displacement from the South Spit. Any restriction in access to the South Spit would require public hearing and review before the California Coastal Commission.

J. No Project Alternative

This alternative proposes that no action is made to change the existing situation on the North and South Spits. No enforcement of the existing LCP would be carried out, and therefore result in continued substantial policy uncertainty, and leave potential major policy decisions without clear and effective guidance. Any impacts or use conflicts resulting from recreational vehicular use would continue to occur.

This alternative would continue to allow vehicular activity where permitted throughout the planning area by not taking any action to prevent such use from occurring. Vehicle use levels would either remain at current levels or increase due the perceived lack of enforcement in the area. Any potential prescriptive rights that have been accrued would continue to be accrued and therefore more difficult to regulate in the future.

Impacts to dune habitats of the planning area would continue to occur throughout the planning area, perpetuating overall degradation of the dune system.

Potential Effects Which May Be Significant		Mitigation Measures/Alternatives
Implementation	1.	In the event that grant funding is not available, implement a user fee at the OHV park.
Geology	1.	Implement monitoring and restoration programs for embryonic dunes and foredune ridge.
	2.	Implement sub-option of establishing vehicle free zones included as part of the alternative.
	3.	Vegetation restoration activities can address potential erosional impacts in their design and implementation. Install access points at regular intervals to the waveslope.
	4.	Realign and monitor access points away from prevailing winds. Monitor the foredune ridge as well.
	5.	Carry out an active trails management plan with design considerations, as mentioned above. Include recommendations in a geology report specific to protecting and managing the foredune complexes.

Potential Effects Which May Be Significant		**Mitigation Measures/Alternatives**
Geology (continued)	6.	Loss of dune forms could be offset by closure of other areas. Sensitive dune forms considered for retention would be signed and fenced. Rotating closures would be utilized to allow other dune forms the opportunity to restabilize. Determine times of closure by fixed photo points that can access the rate of erosion.
	7.	Ensure that adequate buffers are maintained by fixed photo points for assessing the rate of erosion. If specific trails are necessary through sensitive dune forms, orient trails away from prevailing winds.
	8.	Require training of users prior to allowing use of the area.
	9.	In addition to active management, limit the number of users to control erosional impacts to dune forms.
	10.	Apply recommendations in consultant report "Physical Processes, Geomorphology and Management Options for the Coastal Sand Dunes of Humboldt Bay, Humboldt County, California," by Pacific Watershed Associates, on a site specific, project by project basis.

Potential Effects Which May Be Significant	Mitigation Measures/Alternatives
Vegetation	1. Fence and protect dune mat habitat included in or adjacent to active riding areas or mitigate off-site. Align open riding areas to avoid such habitats. Prior to preparing a final Plan, conduct site-specific rare plant surveys for Menzies', beach layia, and pink sandverbena. Fence and protect documented occurrences or enumerate and mitigate off-site. Provide both on-site and off-site restoration.
	2. Conduct annual monitoring plan for rare plant species to determine the relative viability of the population in a given year,with higher density sampling in areas in and adjacent to active riding areas. Manage to increase populations.
	3. Undertake restoration efforts in fenced off dune mat habitat to manage for rare plants.
	Carry out a native plant protection program to monitor and manage the revegetation of previously disturbed areas.
	4. Fence additional stands of rare plants which may occur in habitats other than dune mat.
	5. Implement trail plan that also manages for dune mat and rare plant populations.

Potential Effects Which May Be Significant		**Mitigation Measures/Alternatives**
Vegetation (continued)	6.	Prepare a trails plan which avoids to the maximum amount of dune mat and dune hollows. Provide both on-site and off-site restoration. Utilize additional on-site surveys to prepare the Plan.
	7.	Develop a forest trails management plan for pedestrian use. Reduce random trail cuts and provide interpretive and erosion control improvements.
	8.	Apply the recommendations contained in "Vegetation and Classification, Rare Plant Analysis, Impacts, Restoration, and Habitat Management Strategies," by Tom Duebendorfer, on a site specific, project by project basis.
Wildlife	1.	Post signing along the length of the beach, posting the driftwood zone as off-limits to vehicular traffic.
	2.	Implement an enforceable leash law for dogs.
	3.	Implement a full seasonal closure of the Mad River Spit area to create a Snowy Plover reserve area.
	4.	Implement a seasonal closure on the South Spit from Table Bluff south to the mouth of the Eel River.

Potential Effects Which May Be Significant	Mitigation Measures/Alternatives
Wildlife (continued)	5. Conduct a Snowy Plover survey on an annual basis.
	6. Upon discovery of breeding Plovers, post and demarcate nesting perimeters in consultation with CDFG, and US Fish and Wildlife Service.
	7. Use small cages to project Plovers.
	8. Implement sub-option within alternative of establishing vehicle-free zones.
	9. Apply recommendations contained in "Amphibians, Reptiles and Mammals of the Humboldt Bay Beach and Dunes Study Area," by Karen Theiss and Associates, on a site specific, project by project basis.
	10. Implement restoration projects contained in the Alternative to restore and vegetate areas.
	11. Implement hours of operation between 8 a.m. and 5 p.m. and close riding areas to all OHV use at other times.
	12. Provide animal proof garbage receptacles with convenient and visible locations with regular pick up.

Potential Effects Which May Be Significant		**Mitigation Measures/Alternatives**
Wildlife (continued)	13.	Conduct site specific survey to detect presence/absence of white-footed vole and red-legged frog. Seasonally fence and post areas with documented occurrences.
	14.	Institute vehicle noise standards, monitoring and enforcement.
	15.	Fence areas where invertebrate species are nesting, removing fencing once the nesting cycle has been completed.
	16.	Require a special permit for any major events.
	17.	Conduct field monitoring studies to determine the effects OHV use is having on local wildlife populations and the use of the various habitats.
Ecosystem Function	1.	Implement the vehicle free zones contained in the alternative, under Sub-option B.
	2.	Design and carry out a plant/animal population study which would address fragmentation issues. Identify effects and outline appropriate mitigation measures.
Cultural	1.	Plan pedestrian access facilities and trails to respect cultural resources.

Potential Effects Which May Be Significant		Mitigation Measures/Alternatives
Cultural (continued)	2.	Consult with the Sonoma State archeological inventory to ensure that areas of cultural sensitivity are considered.
	3.	Prior to finalizing plan for development, conduct a site specific survey.
	4.	Conduct monitoring as deemed necessary to check for potential exposure of culturally sensitive sites.
Noise	1.	Under this alternative, no noise impacts were identified. Ensure that adequate buffers are formed adjacent to the staging, vehicle run-up, steep uphill grades and riding areas so that the noise intrusion into other areas is minimized as much as possible.
	2.	Ensure that dune forms between the proposed riding area and the community of Manila are stabilized by fencing and use restrictions to maintain them as a noise buffer.
	3.	Institute vehicle noise standards for recreational vehicles utilizing the OHV park to eliminate noisier vehicles.

Potential Effects Which May Be Significant		Mitigation Measures/Alternatives
Noise (continued)	4.	Subject to existing law, require mufflers which are consistent with the equipment manufacturers' specifications.
	5.	Maintain test station, instrumentation and trained personnel as needed to enforce noise standards.
	6.	Set a 50 to 100 car limit on the number of vehicles able to utilize the park at any one time.
Social	1.	Redirect passive recreational use off the BLM Recreation Area through means of signing. Manage the BLM area more exclusively for OHV use.
	2.	Include restrictions in the vehicle use ordinance similar to those in the current LCP that distinguish between vehicle types.
	3.	Implement a speed limit on the waveslope enforced by ordinance.
	4.	Implement a ticket system at the public riding areas to encourage appropriate user attitudes.
	5.	Implement vehicle-free zones along the community of Manila and Lanphere-Christensen Dunes Preserve.

7.40 ENVIRONMENTAL SETTING

Overview

The following section identifies resource values within the planning area for each alternative where environmental effects and concerns may be evident. Chapter three of the plan provides a description of the environmental setting of each resource value; the following section provides a discussion of the beneficial and/or adverse impacts associated with each alternative. This is followed by an explanation of mitigation measures which are proposed to lessen the impacts, if any, to an insignificant level.

A varied and complex set of ecological components are present on the North and South Spits. The resource element of the plan provides background information on the existing condition of the various resource values. In order to ensure that there was sufficient inventory and analysis of the resource values, consultants were also hired to complete studies that would augment the existing information; studies were conducted in geology, vegetation, wildlife, birds, and insects. The work products associated with these studies are to be considered technical appendices to this EIR and are as follows:

A. Geology

Pacific Watershed Associates, 1992. Physical Processes, Geomorphology, and Management Options for the Coastal Sand Dunes of Humboldt Bay, Humboldt County California. A number of mapping products were produced in conjunction with this report: mapped locations of ancient beach deposits; a comparison of three areas over time utilizing 1939 and 1989 photos for open sand and vegetation cover densities; mapped open sand areas and vegetation densities for remaining 1939 photos; geomorphic map overlays showing major landforms in the study area,for each 1:2400 1988 aerial photo, as well as for 1989 mylar enlargements at 1:6000; map overlays showing areas of interpreted high and extreme erosional susceptibility to physical and mechanical disturbance; and trail maps showing location and size category of trails in the project area.

Botanica Northwest Associates, 1992a. Monitoring Plan for Beach Layia (*Layia Carnosa*) in the Humboldt County Beach and Dunes Planning Area, draft report.

Botanica Northwest Associates, 1992b. Monitoring Plan for Menzies Wallflower (*Erysimum Menziesii*) in the Humboldt County Beach and Dunes Planning Area, draft report.

Botanica Northwest Associates, 1992c. Monitoring Plan for Pink Sand Verbena (*Abronia Umbellata Ssp. Breviflora*) in the Humboldt County Beach and Dunes Planning Area, draft report.

B. Vegetation

Duebendorfer, Tom 1992. Vegetation Classification, Rare Plant Analysis, Impacts, Restoration, and Habitat Management Strategies. Mapping products included revising acetate overlays for the North Spit to include dune forest, dune swamp, saltmarsh, and all other previously unmapped areas; mapping all vegetation types on the South Spit; and rare plant mapping for the entire planning area on the 1988 1:2400 color stereo paired aerial photos. The mapped information was also transferred to 1989 mylar enlargements at 1:6000. In conjunction with the rare plant mapping, data forms for the California Natural Diversity Data Base were filled out by the consultant for all rare plants except the Menzies Wallflower, which has already been done in the past.

C. Wildlife

Karen Theiss and Associates, 1992. Amphibians, Reptiles, and Mammals of the Humboldt Bay Beach and Dunes Study Area. Mapping products included supplemental tables to the 1:6000 vegetation mapping of species use by habitat, and mapping of significant habitats and wildlife observation areas on 1989 1:12000 dot screens for photocopying purposes.

Sterling, John, 1990. Birds of the Coastal Dune Study Area. The purpose of this report was to provide a review of bird species in each habitat within the planning area, a review of species of concern, and to identify locations with high value for wildlife.

Holden, Lori 1991. Insects of the Coastal Dunes on the North and South Spits. This report provides a review of the species in each habitat,and potentially occurring species of special concern.

7.50 PROJECT ALTERNATIVES, EFFECTS, AND MITIGATION

NORTH SPIT ALTERNATIVES

7.51 NORTH SPIT ALTERNATIVE #1

A. Overview

This alternative is similar to a no project alternative. It reflects the existing policy of the Humboldt Bay Local Coastal Plan. It differs from a no project alternative in that it proposes implementing the existing policy of the LCP through adoption of an enforceable use ordinance. It also has more specific recommendations with respect to acquisition, restoration and protection projects. This alternative would substantially reduce impacts of vehicular use to all dune habitats throughout the planning area except for the BLM/Samoa Recreation Area site and the tip of the South Spit Jetty area, both of which are currently designated as Public Recreation (PR) in the LCP. The alternative would also provide programs for restoring degraded dune habitats.

This alternative would reduce and/or displace vehicular activity throughout the planning area, except for the beach strand. Vehicle use along the wave slope would likely increase because of displacement from dune areas. This alternative would be likely to discourage additional OHV use to the area since it would limit OHV use to the waveslope.

B. Implementation

Effective implementation and enforcement of the primary policy in this alternative would likely require a multi-year effort, and reduction and elimination of vehicular impacts to dune habitats would not be immediate, but more likely, be phased out over a number of years, due to the extent of the existing uses.

A higher level of enforcement effort would initially be required to effectively change use patterns. Also, a higher enforcement effort would be required to manage all vehicle types rather than managing just for street legal 4 wheel drive trucks. An estimated level of required enforcement to manage all vehicle types might consist of two full time patrol staff for the north spit (in addition to the BLM on-site ranger) and one full time patrol staff for the south spit. Funding of enforcement, restoration, and maintenance may be a problem. Funding through the OHV Commission for enforcement may not be available

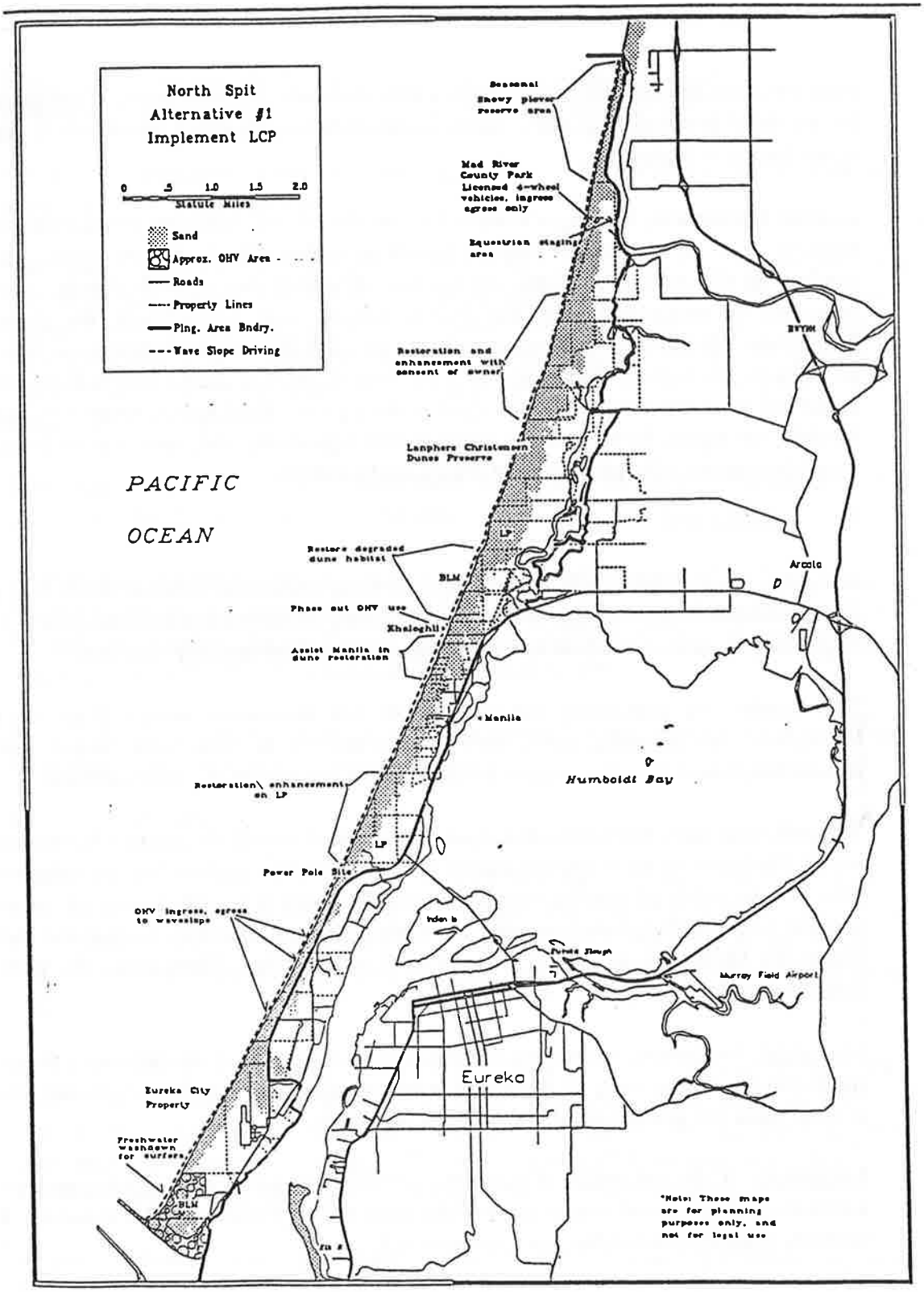


Figure 7.51, North Spit Alternative #1 map

because of the lack of riding opportunities provided under this alternative. Funding could be provided by developing a recreational assessment district, which would likely require several years to implement.

Coastal Conservancy funding is likely to be available to carry out some restoration, but is unlikely that all restoration projects identified under this alternative would receive funding in the near term given the current estimated cost of such efforts. Current estimates of restoration costs for various habitats are: $52,500/acre for European beachgrass, $36,000/acre for beachgrass/dune mat, $13,000/acre for lupine/dune mat, and $4,000/acre for lupine. These estimates are from the Manila Dunes Access Plan and are based on hand treatment of small (per meter) plots. Mechanized treatment appears feasible for lupine for some areas where terrain is generally flat; mechanized treatment would be substantially less expensive than hand treatment.

C. Geological

Assuming this alternative is effectively implemented, substantial reduction and elimination of active trail cutting throughout the vegetated dune and forest areas would occur. Dune ridges, slopes, and areas would become revegetated and increasingly stabilized.

The number of pedestrian use trails under this alternative would likely increase throughout the planning area; however, the number of total trails would still be substantially lower than the number of existing trail cuts within the dune habitats.

The driftwood zone, embryonic dunes, and the seaward face of the primary foredune ridge would likely receive some impacts due to vehicles meandering above the waveslope area; however, assuming substantial compliance with the policy of waveslope driving, vehicular impacts to the primary foredune ridge are likely to be only rare to occasional and natural forces are likely to dominate the shape of the foredune ridge. Blowouts of the foredune ridge by vehicle use may occur on occasion.

Mitigation: Implement monitoring and restoration programs for the embryonic dunes and the foredune ridge to mitigate impacts of potential vehicular caused blowouts and erosion of embryonic and primary foredune building processes.

Mitigation: If the sub-option of establishing vehicle free zones is included as part of this alternative, those areas would receive less impact from vehicles to the foredune area; however some occasional damage may still result.

Restoration activities which remove exotic species could potentially trigger erosional effects, and such effects may in turn impact adjacent habitats and uses.

Mitigation: Vegetation restoration activities shall address potential erosional impacts in their design and implementation.

Vehicular activity could substantially increase at the BLM/Samoa Recreation Area under this alternative. While this alternative may generally depress and reduce the levels of vehicular activity in the planning area, the current level of vehicular activity that occurs in the dunes could be largely displaced to the Samoa Recreation Area. If this were to occur, rapid loss of the vegetation within the foredune area, where the network of riding trails is located, would likely occur.

Mitigation: Implement an active trails management plan to reduce erosional impacts of increased vehicular activity at the BLM area.

Additional recommendations to reduce erosional and other potential geological impacts are contained in the consultant report entitled Physical Processes, Geomorphology, and Management Options for the Coastal Sand Dunes of Humboldt Bay, Humboldt County, California, by Pacific Watershed Associates, December, 1991.

Mitigation: Apply the recommendations contained in this report on a site-specific project by project basis to further reduce erosional impacts.

D. Vegetation

This alternative would, if effectively implemented, substantially reduce or eliminate disturbance to the vegetated dunes throughout the planning area, except at the BLM/Samoa Dunes Recreation Area and at the tip of the South Jetty. Active restoration projects which are part of this alternative would enhance natural vegetation where carried out.

In the absence of active trail use by vehicles in the vegetated dunes and forested areas, there would be an increased potential for trails to revegetate. Narrower trails would be more likely to be colonized by plants within a three to five year period, while the wider trails may take longer to revegetate. The type of plants likely to revegetate these areas would be dependent on the dominant species in the vicinity of the trail cuts.

In places where trail cutting was active through areas predominantly vegetated by native plants, these areas would most likely become revegetated by these species, and would

result in improved dune habitat; however, in areas vegetated by exotic species, these areas would most likely become revegetated with those same species in adjoining areas, and become increasingly stabilized with exotics. The exception to either of the above possibilities would be in cases where trails were oriented with prevailing wind patterns. As described in the above referenced geology report, these areas would be least likely to recover from past use and may require active restoration measures for vegetation to become reestablished.

As mentioned under the geological section, even with substantial compliance, some vehicles may meander above the waveslope causing damage to the hummocks forming on the waveslope just above the high tide line. These embryonic dunes are often stabilized by the native dune grass, which is also considered to be a relatively rare community, the northern foredune grassland community. Impacts could be substantially increased if recreational vehicles were concentrated further on the waveslope. Conspicuously posted signing and a high visibility beach patrol should be able to achieve substantial compliance and minimize impacts to vegetation.

The rare plants would likely be successful in recolonizing previously disturbed areas. These plants have been observed colonizing margins of trail cuts in other areas, which have been subject to occasional past disturbances. In the immediate years following implementation of this alternative, rare plant populations may increase as previously disturbed areas become less subject to potential disturbance; however, without active management and the restoration projects outlined under this alternative, it is likely that in the long run, the invasive plants in most areas would continue to displace native plant populations, including the rare plants.

Within the planning area there are approximately 469 acres of lupine and 393 acres of beachgrass on the North Spit and 196 acres of lupine and 83 acres of beachgrass on the South Spit. Restoration projects identified under this alternative would treat about 20% of these acres. Not included in this treatment total are the BLM and City of Eureka and Nature Conservancy restoration project areas, the beachgrass dominated strip along New Navy Base Road, the Manila dunes restoration projects proposed for the Rudd and Celestre properties, and the South Spit.

Mitigation: Carry out a native plant management program to monitor and manage the revegetation of previously disturbed areas by controlling the spread of invasive species and encouraging favorable conditions for native plants. This would include protection/ restoration/enhancement projects such as those outlined in the alternatives.

This alternative would substantially reduce the fragmentation of plant communities throughout the planning area which have been previously disturbed by random multiple trail cutting. Larger contiguous stands of plant communities would likely develop. This may help reduce the threat to rare plant populations by increasing opportunities for gene flow, unless these populations were out-competed by more aggressive invasive species.

In the long term, revegetation and stabilization of inland dune forms and dune ridges within the planning area may promote plant community succession. Dune forms with stabilized vegetation will tend to increase nutrient trapping and soil building. This may eventually lead to extending the forested ridges beyond their current bounds. Because of the variations in the natural forces acting on the area, it is difficult to be predictive in this regard.

Additional recommendations to reduce vegetation and rare plant impacts are contained in the consultant report entitled Vegetation Classification, Rare Plant Analysis, Impacts, Restoration, and Habitat Management Strategies, by Tom Duebendorfer, January 1992.

Mitigation: Apply the recommendations contained in this report on a site-specific project by project basis to further reduce vegetation impacts.

E. Wildlife

This alternative would generally increase protection of and reduce impacts on most wildlife species within the planning area. A reduction in impacts to most wildlife species throughout the vegetated dunes would likely occur. Because vegetated cover would increase, wildlife species utilizing such cover may also be at an advantage, resulting in higher densities of species.

If vehicle use increases along the waveslope, this alternative may have additional impacts to shorebirds feeding on the beach strand, and snowy plovers nesting in the driftwood zone. In those areas where birds rest or feed, excessive traffic can disturb flocks; heavy vehicle impact could affect the food sources of migrating shorebirds, but drivers generally stay away from the soft, intertidal sediments where the birds forage (Godfrey, Leatherman, and Buckley 1978). Pedestrians and dogs however, do frighten the birds and can hinder their ability to feed. When birds are forced further up on the flats by rising tides, they can be frightened away by numerous passing vehicles, as well as by people and dogs.

Impacts to feeding shorebird flocks may not be substantially different under this alternative than other alternatives which would combine increased pedestrian use in

sections with increased vehicle use in other areas, but likely reduce impacts from those alternatives that allow high speed vehicle use along the beach strand for feeding shorebird flocks.

With respect to the snowy plover, any excursions up into the driftwood zone in stretches of the beaches known to provide nesting habitat during the nesting season from mid-March through mid-September, are likely to have some impact. Human activity on beaches (walking, jogging, walking pets, off-road vehicle use, and horseback riding use) during the nesting season would also impact the plovers. Encroachment of exotic European beachgrass and predation were also considered primary factors in the observed decline of the Snowy Plover. (Fed.Register Vol.57,No.9).

The following mitigation measures will reduce impacts:

Mitigation: Post signing along the length of the beach, posting the driftwood zone as off-limits to vehicular traffic, to reduce excursions into the driftwood zone.

Mitigation: Implement an enforceable leash law to reduce impacts of free roaming dogs on shorebirds, high tide roosts, and snowy plover nests.

Mitigation: Implement a full seasonal closure of the Mad River Spit area to create a Snowy Plover reserve area. The Mad River Spit area is one of the higher Snowy Plover use areas within the planning area, and seems to be the currently favored location for nesting sites. The closure should be for pedestrian, equestrian, and vehicular use, except by special permission during the nesting and breeding season of the bird.

Mitigation: Implement a seasonal closure on the South Spit from Table Bluff south to the mouth of the Eel River. Although this section of the beach is outside the planning area, nests have recently been documented on the South Spit, and it would be safe to assume that plovers sited in the planning area could potentially use this location for nesting.

Mitigation: Conduct a snowy plover survey on an annual basis to determine population size during the breeding season, nesting success as well attempts.

Mitigation: Upon the discovery of breeding plovers outside the protected Mad River Spit area, and the seasonal closure of Table Bluff south, post and demarcate nesting perimeters in consultation with CDFG and USFWS to prevent accidental nest destruction. Use Small cages to protect plovers from predation, a practice that has proved successful with plover nests at the San Francisco Bay Wildlife Refuge.

Mitigation: If the sub-option of establishing vehicle free zones is included as part of this alternative, some of the high tide roosts would receive less impact from vehicles on the waveslope; however some occasional damage may still result, unless some attempt is made to also control passive uses as well.

Any potential increase in vehicular traffic along the beach strand could potentially increase impacts to invertebrates living in the sand. A study published in 1977 assessed the impacts on sand beach animals at crescent beach (Boyd, De Martini, 1977). The vertical distribution of organisms in beach sands and the effect of vehicle survival was studied.

Dominant species were focalized within the top ten centimeters of beach sand, with the majority of all organisms within five centimeters of the surface. Control and experimental spots were established at mid-beach and an International Harvester "Scout" (gross weight 4840 pound) was driven over the experimental plot. Both plots were randomly sampled by taking ten samples 0.1 meters squared in area to a depth of 20 centimeters.

Study results showed that vehicles do cause a significant mortality of animals at Crescent Beach (17.5% mortality in the experimental plot, versus 3.8% mortality in the control plot). The study was unable to assess any deleterious effects of such mortality on long-term population changes.

In addition, the study also found that there were substantial differences in the faunal composition on the three beaches in the study area (Crescent beach, Gold Bluffs Beach, and Redwood Creek Beach), thus it is not clear how transferable the study results relating to vehicle mortality are likely to be.

Mitigation: If the sub-option of establishing vehicle free zones is included as part of this alternative, some of the invertebrate populations would receive less impact from vehicles on the waveslope.

Additional recommendations to reduce wildlife habitat and wildlife impacts are contained in the consultant report entitled Amphibians, Reptiles, and Mammals of the Humboldt Bay Beach and Dunes Study Area, by Karen Theiss and Associates, January 1992.

Mitigation: Apply the recommendations contained in this report on a site-specific project by project basis to further reduce erosional impacts.

F. Ecosystem Function

The most naturally variable and therefore the most resistant to long term vehicle impact appears to be the intertidal ocean beach, or waveslope (Godfrey, Leatherman, and Buckley, 1978). This alternative would concentrate vehicle use in this area, and therefore would be the least environmentally damaging area to concentrate vehicles. This alternative does however isolate one component, the waveslope, from the rest of the dune system, and allows vehicle use in the entire planning area on the waveslope.

Mitigation: Implement the vehicle free zones contained in sub-option B.

G. Cultural

Under this alternative, impacts to both archeological and historical sites would be substantially reduced from current conditions where sensitive cultural resource areas are subject to mechanical disturbance from vehicles. This alternative may increase the potential for disturbance of sites by increasing pedestrian use of these areas.

Mitigation: Plan pedestrian access facilities and trails to respect cultural resources by either avoiding them or providing managed interpretation for sites.

H. Noise

Under this alternative, noise impacts would be relatively low. In much of the planning area, ambient noise levels are probably highest on the waveslope due to the proximity of the ocean. If vehicles are limited to 15 mph, noise generated by them will be below ambient along the waveslope if vehicles are in compliance with EPA standards.

I. Social

Conflicts between user groups would still be likely to occur on the waveslope. If all vehicular traffic is displaced to the waveslope, use conflicts could potentially increase. However, the intent of the allowed vehicle use under this alternative is to provide ingress/egress vehicle access, rather than providing recreational driving.

Mitigation: Since the majority of the planning area would be for passive recreational uses, redirect this use off of the BLM Jetty recreation area through means of signing. Manage the BLM area more exclusively for OHV use.

Mitigation: The current LCP distinguishes between vehicle types, separating recreational ORV's from commercial or street legal ORV's. On Mad River County Park the

ordinance specifically prohibits ATV's, motorcycles, dune buggies, and other "recreational" vehicles. Reduce use conflicts by including such restrictions in the vehicle use ordinance.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions; therefore since this alternative would reduce effects, impacts would be considered insignificant on the dune geology.

Effects on vegetation under this alternative would be considered significant; however such impacts are generally considered to be positive. As discussed above, the vegetation is likely to increase over time. Fragmentation of individual stands is likely to be reduced by revegetation of trail cuts. However, without active management, invasives could displace native vegetation in the long term.

Disturbances to wildlife in the dune areas would be substantially reduced under this alternative. An anticipated increase in vegetation cover would likely increase available habitat. Therefore this alternative would not result in a significant effect on wildlife of the dune areas, and would more likely enhance such values.

Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed above as part of this alternative. Monitoring studies which are included in the mitigation measures, would determine the relative success of such actions and whether or not impacts are significant.

Archeological and historical sites under this alternative would no longer be subject to mechanical disturbance. Pedestrian/equestrian use and potential disturbance to archeological/cultural sites would be greatly reduced by the mitigation measure discussed above; therefore no significant impact to cultural sites is identified under this alternative.

Under this alternative, impacts to much of the dune system would be insignificant. This alternative would in a sense however, continue to disperse OHV use on the waveslope of the entire planning area, rather than concentrating OHV use at specific locations.

7.52 ALTERNATIVE #2 - EXPANSION OF BLM/NORTH JETTY RIDING AREA

A. Overview

This alternative is similar to Alternative #1 except for an expanded riding area which would include the primary foredune zone as far as the northern property line of the Eureka City Airport, and a vehicle free zone. For the most part it reflects the existing policy of the Humboldt Bay Local Coastal Plan, except for the vehicle free zone. It differs from Alternative #1 is that it proposes expanding the existing BLM riding area, which is allowed under the Humboldt Bay Local Coastal Plan, at the North Jetty, to include the foredune zone along the Eureka City Airport, and a vehicle free zone in front of Manila, from the southern boundary of the Rudd property north to the southern boundary of the Khaloghli property, which would also be allowed under the current LCP.

This alternative would substantially reduce impacts of vehicular use to all dune habitats throughout the planning area except for the BLM/Samoa Recreation Area site, the expanded portion of the riding area and the tip of the South Spit Jetty area. While the BLM/Samoa Recreation Area site and the tip of the South Spit Jetty are both currently designated as Public Recreation in the LCP, this would require an amendment in the LCP to include this additional portion of the North Spit foredune area into this area of public recreation. There would be the potential for some off-site impacts. This alternative would also provide for active programs for restoring degraded dune habitats.

This alternative would reduce and/or displace vehicular activity throughout the planning area, except for the beach strand and the expanded riding area at the BLM/North Jetty area onto the Eureka City property. This alternative would approximately double the 125 acres of OHV trail riding on the BLM/North Jetty area by adding 110 acres of trail riding on the City of Eureka Airport property. Vehicle use along the waveslope would likely increase.

B. Implementation

See implementation discussion under Alternative #1 for areas where the proposals are the same.

As mentioned in the paragraph above, the proposal to expand the riding area in the foredune of the airport property would require amending the LCP. The City of Eureka has in the past expressed concern with proposals which would interfere with the potential for future industrial use of this site. This proposal should not conflict with such uses, nor

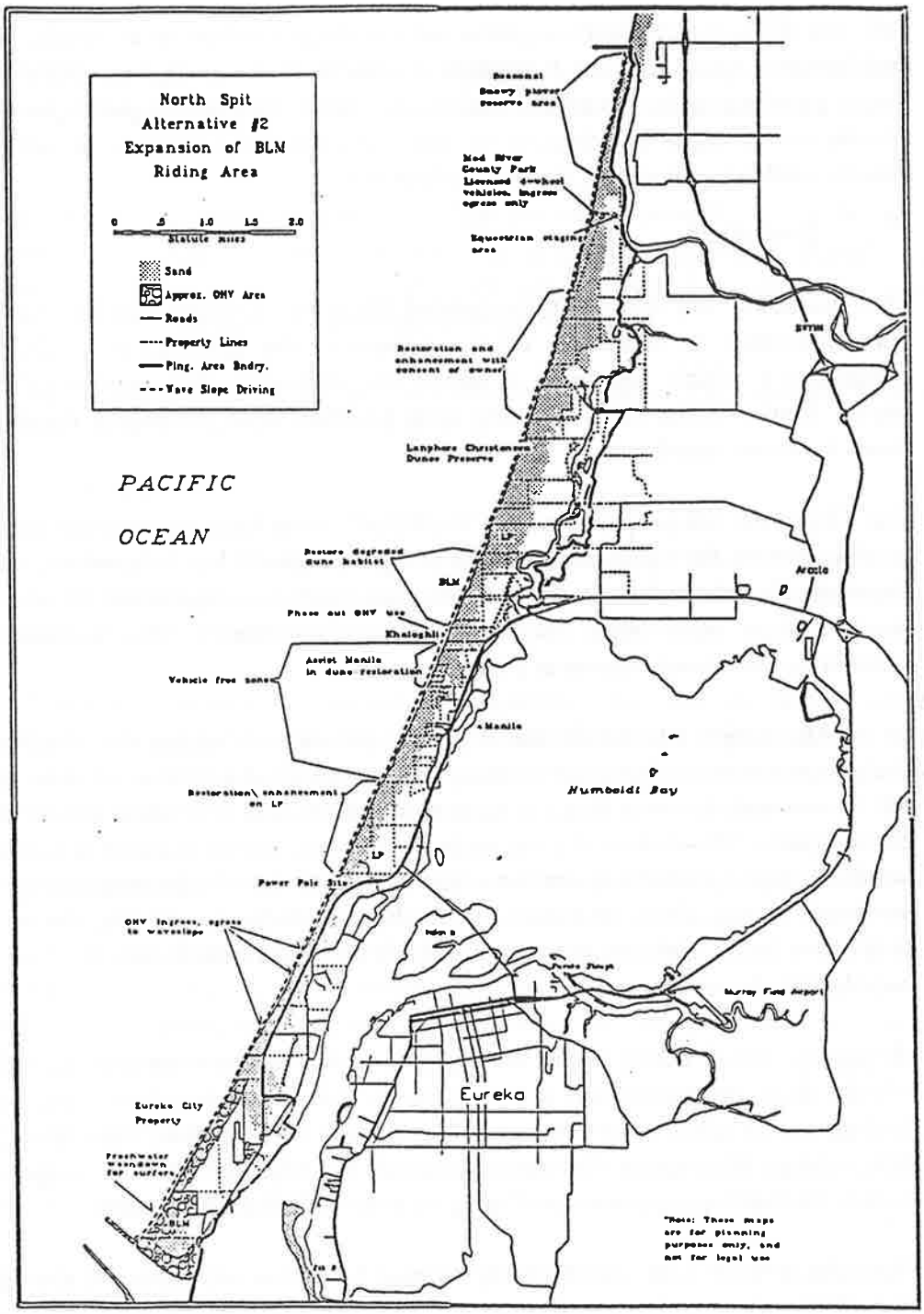


Figure 7.52, North Spit Alternative #2 map

with the 80 acre rare plant mitigation site. Funding of enforcement should be less of a problem than Alternative #1. It appears reasonable to assume that the OHV Commission would provide funding for off-site and on-site patrol. One on-site patrol person and one off-site patrol might be adequate to effectively cover the North Spit, with help from Manila residents to maintain the vehicle free zone.

C. Geological

This discussion will focus on the expanded riding area proposed under this alternative. See Alternative #1 discussion for the balance of the planning area. Since Manila is considered a vehicle free zone as part of this alternative, this area would receive less impact from vehicles in the foredune area; however, some occasional damage may still result from noncompliance.

The City of Eureka property and the BLM/North Jetty Area, would experience increased erosion due to the foredune sensitivity as a geomorphic feature; however, much of the foredune is composed of European beach grass and lupine, and would be considered less sensitive than other areas that might be semi-stabilized by the northern foredune community (commonly known as dune mat).

As in Alternative #1, the number of pedestrian use trails under this alternative would likely increase throughout the planning area; however, the number of total trails would still be substantially lower than the number of existing trail cuts within dune habitats of the planning area. The driftwood zone, embryonic dunes, and the seaward face of the primary foredune ridge would likely receive some impacts due to vehicles meandering above the waveslope during times of extreme high tides, and during the winter, due to the steep bluffs that form. Because of this unavoidable use, occasional blowouts of the foredune ridge by vehicle use may occur.

Mitigation: Install access points at regular intervals to the waveslope to help prevent vehicles from the necessity of driving on the foredune area in order to avoid high tides. Realign access points away from prevailing winds in order to protect the dune features in that vicinity. Monitoring of these access points as well as the foredune ridge in ongoing erosion restoration programs could mitigate potential vehicular impacts.

Vehicular activity could substantially increase due to the expansion of the BLM/North Jetty Riding Area under this alternative. While this alternative may generally reduce the levels of vehicular activity in the planning area, the current level of activity in the planning area could be displaced to this one location. If this were to occur, rapid loss of vegetation within the primary foredune where the network of OHV trails is located would likely

occur.

Mitigation: Carry out an active trails management plan with design considerations as mentioned above, such as insuring that trails are aligned away from prevailing winds.

Additional recommendations to reduce erosional and other potential geologic impacts are contained in the consultant report entitled Physical Processes, Geomorphology and Management Options for the Coastal Sand Dunes of Humboldt Bay, Humboldt County, California by Pacific Watershed Associates, December, 1991.

Mitigation: Apply recommendations contained in this report on a site-specific project by project basis to further reduce erosional impacts.

D. Vegetation

This alternative would, if effectively implemented, significantly reduce disturbance to the vegetated dunes throughout the planning area, except at the expanded BLM/North Jetty riding Area. See Alternative #1 for a discussion of these other areas.

In the 110 acres of expanded riding area, a reasonable worst case assumption would be that all vegetation would eventually be removed. Since the vegetation is primarily European beachgrass and bush lupine, such an impact is generally not considered adverse because of the invasive nature of these plants.

In terms of impacts to rare plants, sporadic occurrences of beach layia are likely to occur in portions of the primary foredune area on the City of Eureka property. Field work to date indicates most of these occurrences are found within the lupine that is within the 80 acre mitigation site, which would continue to be protected under this alternative. The number of beach layia occurring in the proposed riding area under this alternative may be so low as to constitute an insignificant or incidental take.

Mitigation: Prior to preparing a final plan, site specific rare plant surveys should be conducted within the riding area. Plants found should be fenced and protected or enumerated and mitigated off-site.

In addition to rare plants, approximately three acres of dune mat occurs within the riding area.

Mitigation: Dune mat habitat should be fenced and protected or mitigated off-site.

Although the worst case assumption is that all vegetation would be removed in the riding area, substantial vegetation may remain at lower use levels, such as those currently occurring at the BLM Samoa Dunes trail riding area. If this is the case, opportunities exist for vegetation management.

Mitigation: Carry out an active trails management plan as mentioned above, such as insuring that trails are aligned away from prevailing winds. Trail design could also manage for dune mat and rare plant populations.

Additional recommendations to reduce vegetation and rare plant impacts are contained in the consultant report entitled Vegetation Classification, Rare Plant Analysis, Impacts, Restoration, and Habitat Management Strategies, by Tom Duebendorfer, January 1992.

Mitigation: The recommendations contained in this report could be applied on a site-specific project by project basis to further reduce vegetation impacts.

E. Wildlife

This alternative would, if effectively implemented, substantially reduce disturbance to wildlife habitat throughout the planning area except on the beach strand and at the expanded BLM/North Jetty Riding Area. In addition, the designation of Manila as a vehicle free zone may reduce wildlife impacts associated with OHV use. See Alternative #1 for a discussion of these other areas.

Since impacts would largely be confined to the beach strand and the expanded BLM/North Jetty Riding Area, a reduction in impacts to most wildlife species throughout the vegetated dunes would likely occur. Vegetated cover would increase cover for wildlife which would result in higher densities of species outside the proposed riding area.

For the existing and proposed expanded riding areas near the north jetty and airport, it could be expected that species utilizing the beachgrass and lupine/scrub habitats on and adjacent to these parcels would be impacted. Species utilizing those habitats are described in the Theiss & Assoc. report. In the immediate affected area, wildlife species would be impacted by mechanical destruction of habitat, direct mortality, and increased levels of human use. One species which could adversely impacted is the red legged frog, a species of concern which has been found to be breeding successfully in ephemeral pools in the planning area. Increased noise levels could also displace some species adjacent to the affected area. However, observations in other areas suggest that to some degree species can become conditioned to changes in noise levels, although sensitivity may vary amongst

species.

Mitigation: Active restoration projects which restore and vegetate areas can offset habitat and disturbance losses in the active riding areas.

The black-capped chickadee, a species of special concern, nests in the woody hollows on the City of Eureka property; however, since OHV use already occurs in the vicinity, it is likely that increased levels of OHV riding in this area would not significantly impact wildlife use in the area, since the nesting area would be off-limits to OHV use.

Mitigation: Prior to development require that the 80 acre mitigation site be effectively fenced to provide a buffer.

Additional recommendations to reduce wildlife habitat and wildlife impacts are contained in the consultant report entitled Amphibians, Reptiles, and Mammals of the Humboldt Bay Beach and Dunes Study Area, by Karen Theiss and Associates, January 1992.

Mitigation: Apply the recommendations contained in this report on a site-specific project by project basis to further reduce erosional impacts.

F. Ecosystem Function

Impacts to much of the dune system would be minimized, except at the proposed expanded OHV riding area and the waveslope. The area proposed for expanded OHV riding is considered to already be functioning poorly on an ecosystem level; an increase in OHV use would cause further impacts to an already degraded area. Restoration potential is also considered low.

Further impacts may be an issue in regard to stressing the existing wildlife population. An increase in OHV use could further inhibit and displace wildlife use in this particular area, which could cause a greater competition for resources overall. Such an affect could lead to a reduction in species numbers. Impacts to wildlife in this area would be largely offset by the majority of the planning area (except for the expanded riding area and the waveslope) being closed to OHV use; this would enhance ecosystem values overall. See alternative #1 for discussion of impacts associated with waveslope driving.

G. Cultural

This alternative would, in its implementation, probably greatly reduce potential impacts to cultural and archaeological sites of significance. The one area where OHV use would be increased is considered to be a relatively new deposit, and therefore an unlikely area for cultural or archaeological artifacts to be impacted.

This area has been extensively studied in the past due to the Exxon project; therefore it is relatively certain that these impacts would be quite low.

Mitigation: Due to the low level of identified impacts, mitigation would not be considered necessary under this alternative.

H. Noise

Ambient noise levels are considered high in this area. They were extensively studied under contract for the Exxon Platform Assembly Jacket Site EIR in 1984. Due to what are considered to be already high levels of background noise, the extended riding area on the City of Eureka property would not be considered to greatly impact noise levels in the area; however, there could be some impacts on wildlife in adjacent hollows due to in increased levels of OHV use in this area.

Since the majority of the planning area is closed to OHV use above the waveslope, and that Manila is closed to OHV's, noise levels would be substantially reduced in the balance of the planning area. Therefore the increased level of noise in the vicinity of the jetty and the proposed expanded riding area on the City of Eureka property be considered to have a minimal impact on the environment.

I. Social

The North Jetty area is used by a wide range of recreational use types. There have been use conflicts in the past between different user groups. Conflicts between user groups could increase by directing additional OHV activity to this site.

Mitigation: Since the majority of the planning area would be for passive recreational uses, redirect passive use elsewhere through means of signing. Manage the area more exclusively for OHV use. A speed limit on the waveslope could be implemented and enforced by ordinance.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions. This alternative would reduce geomorphological effects throughout most of the planning area. This would result in increased stabilization of dune forms. Such an effect could be considered significant but not adverse.

For the primary foredune area in the vicinity of the North Jetty which would be designated as an OHV riding area, erosional impacts would significantly increase. The increased erosional impacts could be reduced by implementation of an active trails management plan with design considerations as mentioned above under geological mitigation measures, such as insuring that trails are aligned away from prevailing winds. The level of significance of erosional impacts with active trail management depends largely on the amount of use. Currently at the BLM Samoa Dunes trails area, the use level is low enough that erosion is not a significant concern.

Effects on vegetation for the balance of the planning area under this alternative would be positive. As discussed above, the vegetation is likely to increase over time. Fragmentation of individual stands is likely to be reduced by revegetation of trail cuts. However, without active management, invasives could displace native vegetation in the long term.

Vegetation in the designated riding area near the North Jetty would be significantly impacted by mechanical destruction. While the area is primarily composed of European beachgrass and bush lupine, beach layia may occur and individual plants would be destroyed within the designated riding area. Mitigation measures for this alternative would most likely need to be carried out in consultation with CDFG and USFWS.

Disturbances to wildlife in most dune areas would be substantially reduced under this alternative, except at the expanded riding area. On balance, the anticipated increase in vegetation cover in most areas would likely increase available habitat. This alternative would result in a significant effect on wildlife in the expanded riding area, but would be more than offset by revegetation and reduction in disturbance in the balance of the planning area.

Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed above as part of this alternative. Monitoring studies which are included in the mitigation measures, would determine the relative success of such actions and whether or not impacts would remain significant.

Archeological and historical sites under this alternative would no longer be subject to mechanical disturbance. Pedestrian/equestrian use and potential disturbance to archeological/cultural sites would be greatly reduced by the mitigation measure discussed above; therefore no significant impact to cultural sites is identified under this alternative.

Under this alternative, impacts to much of the dune system would be reduced, except at the expanded OHV riding area and the waveslope. The area proposed for expanded OHV riding at the North Jetty is already substantially impacted; therefore an expansion of OHV use in this area would not result in a significant loss of high quality habitat. OHV use could however, without proper mitigation, further degrade habitat values of an already fragmented area.

7.53. NORTH SPIT ALTERNATIVE #3 - RECREATIONAL RIDING SOUTH OF THE POWER POLE SITE (COMMITTEE PREFERRED ALTERNATIVE)

A. Overview

This alternative is similar to Alternative #2 except that it includes the foredune area north to the power pole site. For the most part it reflects the existing policy of the Humboldt Bay Local Coastal Plan, although it does allow for OHV use above the waveslope on the City of Eureka property and along New Navy Base Road to the power poles, and closes the rest of the beach to motorized vehicle traffic, including the waveslope.

This alternative would substantially reduce impacts of vehicular use to all dune habitats throughout the planning area except for the area from the BLM/Samoa Recreation Area site to the power pole site, and the tip of the South Spit Jetty area. While the BLM/Samoa Recreation Area site and the tip of the South Spit Jetty are both currently designated as Public Recreation in the LCP, this would require an amendment in the LCP to include this additional portion of the North Spit foredune area into this area of public recreation. The designation of the foredune stretch along New Navy Base Road may be less of an issue since vertical access to the waveslope by OHV's is an allowed use under the current LCP. There would be the potential for some off-site impacts. This alternative would also provide for active programs for restoring degraded dune habitats.

This alternative would reduce and/or displace vehicular activity throughout the planning area, except for the beach strand and the expanded riding area extending north to the power pole site. This alternative would approximately triple the 125 acres of OHV trail riding on the BLM/North Jetty area by adding 110 acres of riding on the City of Eureka Airport property, and 117 acres of riding along New Navy Base Road.

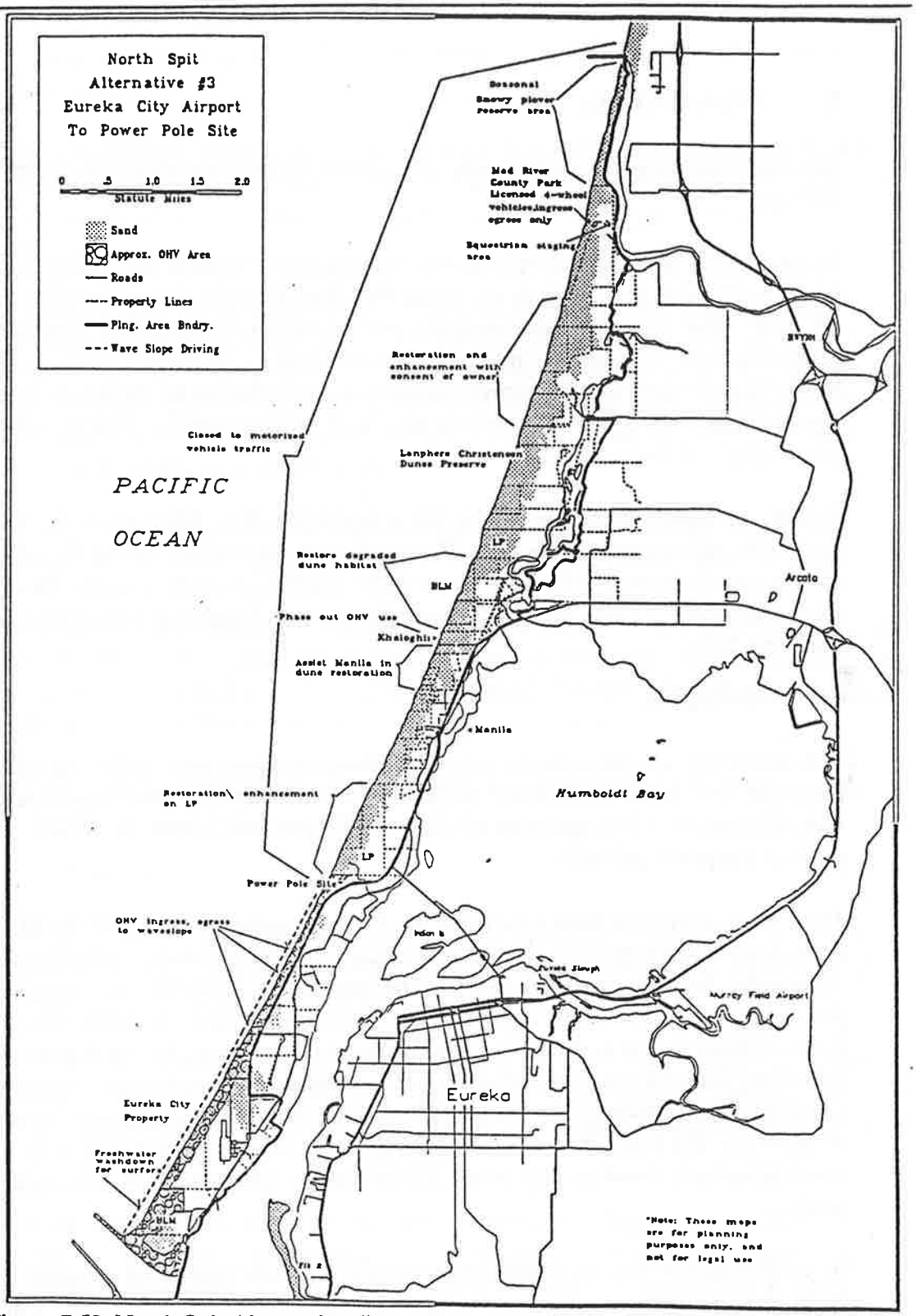


Figure 7.53, North Spit Alternative #3 map

B. Implementation

See implementation discussion under Alternative #1 for areas where the proposals are the same.

As mentioned in the paragraph above, the proposal to expand the riding area in the foredune of the airport property and along New Navy Base Road would require amending the LCP. The City of Eureka has in the past expressed concern with proposals which would interfere with the potential for future industrial use of this site. Simpson, LP, and North Coast Export do not appear to object to recreational use on their dune properties; however there would likely be concerns associated with the outfalls. This proposal should not conflict with such uses.

Funding of enforcement should be less of a problem than Alternative #1. It appears reasonable to assume that the OHV Commission would provide funding for off-site and on-site patrol. Between 2-3 personnel would be needed for patrol, with one for the riding area, one for other areas, and possibly one shared might be adequate to effectively cover the North Spit.

C. Geological

This discussion will focus on the expanded riding area proposed under this alternative. Since the rest of the beach would be closed to motorized traffic, the impacts associated with Alternative #1 as specified for dune areas above the waveslope would still apply north of the power pole site.

The stretch along New Navy Base Road, the City of Eureka property, and the BLM/North Jetty Area, would experience increased erosion due to the sensitivity of the foredune as a geomorphic feature; however, much of the foredune is composed of European beach grass and lupine, and would be considered less sensitive than other areas that might be semi-stabilized by the northern foredune community (commonly known as dune mat). At issue along New Navy Base Road would be the considerable investment by industry on the east side of the highway; OHV use could destabilize the dunes and promote the formation of blowouts. The North Spit is considered vulnerable to storm hazard, and such blowouts could potentially develop into zones of overwash, or promote windblown sand on the highway.

As in Alternative #1, the number of pedestrian use trails under this alternative would likely increase throughout the planning area; however, the number of total trails would

still be substantially lower than the number of existing trail cuts within dune habitats of the planning area.

Mitigation: Realign access points away from prevailing winds in order to protect the dune features in that vicinity. Monitor access points as well as the foredune ridge, and conduct erosion restoration programs with rotating closures to mitigate potential vehicular impacts.

Vehicular activity could substantially increase due to the expansion of the BLM/North Jetty Riding Area under this alternative. While this alternative may generally reduce the levels of vehicular activity due to the lack of challenging terrain in the riding area, the current level of activity in the planning area could be displaced to this one location. If this were to occur, rapid loss of vegetation within the primary foredune where the network of OHV trails is located would likely occur.

Mitigation: Carry out an active trails management plan with design considerations as mentioned above, such as insuring that trails are aligned away from prevailing winds.

Additional recommendations to reduce erosional and other potential geologic impacts are contained in the consultant report entitled Physical Processes, Geomorphology and Management Options for the Coastal Sand Dunes of Humboldt Bay, Humboldt County, California by Pacific Watershed Associates, December, 1991.

Mitigation: Apply recommendations contained in this report on a site-specific project by project basis to further reduce erosional impacts.

D. Vegetation

This alternative would, if effectively implemented, significantly reduce disturbance to the vegetated dunes throughout the planning area, except at the expanded BLM/North Jetty riding Area. See Alternative #1 for a discussion of these other areas.

In the 227 acres of expanded riding area, a reasonable worst case assumption would be that all vegetation would eventually be removed. Since the vegetation is primarily European beachgrass and bush lupine, such an impact is generally not considered adverse because of the invasive nature of these plants.

In terms of impacts to rare plants, occurrences of beach layia have been documented on the primary foredune area on the City of Eureka, Simpson, North Coast Export, and LP properties. Field work to date indicates most of these occurrences are found on the

southern end of the LP property, and in the 80 acre mitigation site, which would continue to be protected under this alternative, and east of New Navy Base Road.

Mitigation: Prior to preparing a final plan, site specific rare plant surveys should be conducted within the riding area. Plants found should be fenced and protected or enumerated and mitigated off-site.

In addition to rare plants, approximately three acres of dune mat occurs within the riding area.

Mitigation: Dune mat habitat should be fenced and protected or mitigated off-site.

Although the worst case assumption is that all vegetation would be removed in the riding area, substantial vegetation may remain at lower use levels, such as those currently occurring at the BLM Samoa Dunes trail riding area. If this is the case, opportunities exist for vegetation management.

Mitigation: Carry out an active trails management plan as mentioned above, such as insuring that trails are aligned away from prevailing winds. Trail design could also manage for dune mat and rare plant populations.

Additional recommendations to reduce vegetation and rare plant impacts are contained in the consultant report entitled Vegetation Classification, Rare Plant Analysis, Impacts, Restoration, and Habitat Management Strategies, by Tom Duebendorfer, January 1992.

Mitigation: The recommendations contained in this report could be applied on a site-specific project by project basis to further reduce vegetation impacts.

E. Wildlife

This alternative would, if effectively implemented, substantially reduce disturbance to wildlife habitat throughout the planning area except from the expanded BLM/North Jetty Riding Area north to the power pole site. See Alternative #1 for a discussion of the BLM North Jetty area, and impacts associated with driving on the waveslope along this stretch of the beach.

Since impacts would largely be confined to the dunes stretch from the North Jetty to the power pole site, a reduction in impacts to most wildlife species throughout the vegetated dunes would likely occur. Vegetated cover would increase habitat for wildlife which would result in higher densities of species outside the proposed riding area.

Significant impacts on wildlife in the dunes for this area are limited. It is generally agreed upon that the existing habitat along New Navy Base Road to the power poles is of little value to wildlife; the vegetation occurs in a narrow strip between the beach strand and the highway, and is predominantly beachgrass and lupine. However, the species utilizing these habitats would be impacted.

It could be expected that species utilizing the beachgrass and lupine/scrub habitats on and adjacent to these parcels would suffer a reduction in numbers in this area and possibly be displaced to other dune areas. Species utilizing those habitats are described in the Theiss and Associates report. In the immediate affected area, wildlife species would be impacted by mechanical destruction of habitat, direct mortality, and increased levels of human use. Increased noise levels could also displace some species adjacent to the affected area. However, observations in other areas suggest that to some degree species can become conditioned to changes in noise levels, although sensitivity may vary amongst species. OHV use in this area could also fragment whatever remaining values this area retains as a wildlife corridor between areas on the North Spit.

Mitigation: Active restoration projects which restore and vegetate areas can offset habitat and disturbance losses in the active riding areas.

Mitigation: Prior to development require that the 80 acre mitigation site be effectively fenced to provide a buffer.

Additional recommendations to reduce wildlife habitat and wildlife impacts are contained in the consultant report entitled Amphibians, Reptiles, and Mammals of the Humboldt Bay Beach and Dunes Study Area, by Karen Theiss and Associates, January 1992.

Mitigation: Apply the recommendations contained in this report on a site-specific project by project basis to further reduce erosional impacts.

F. Ecosystem Function

Impacts to much of the dune system would be minimized, except in the foredune area from the City of Eureka to the power pole site on the LP property. The area proposed for OHV riding is considered to already be functioning poorly on an ecosystem level; an increase in OHV use would cause further impacts to an already degraded area. Restoration potential is also considered low. Further impacts may be an issue in regard to stressing the existing wildlife population. An increase in OHV use could further inhibit

and displace wildlife use in this particular area, which could cause a greater competition for resources overall. Such an affect could lead to a reduction in species numbers.

Mitigation: Design and carry out a plant and animal population studies which would address the fragmentation issue associated with the northern populations of flora and fauna from the North Jetty area. Outline appropriate mitigation techniques to address identified effects.

Impacts to wildlife in this area would be largely offset by the majority of the planning area being closed to OHV use; this would enhance ecosystem values overall. See alternative #1 for discussion of impacts for closure of dune areas above the waveslope, as well as for a discussion on impacts that would occur along the waveslope stretch of this portion of the planning area.

G. Cultural

This alternative would, in its implementation, probably greatly reduce potential impacts to cultural and archaeological sites of significance. The one area where OHV use would be increased is considered to be a relatively new deposit, and therefore an unlikely area for cultural or archaeological artifacts to be impacted.

This southern portion of the riding area has been extensively studied in the past due to the Exxon project; the rest of the proposed riding area to the north is a relatively new deposit. Therefore it is relatively certain that these impacts would be quite low.

Mitigation: Due to the low level of identified impacts, mitigation would not be considered necessary under this alternative.

H. Noise

Ambient noise levels are considered relatively high in this area due to the nearness of the highway, industrial uses, and the surf zone. Due to what are considered to be already high levels of background noise, the extended riding area on the City of Eureka property would not be considered to greatly impact noise levels in the area; however, there could be some impacts on wildlife in adjacent hollows due to in increased levels of OHV use in this area.

Background noise is even higher along New Navy Base Road; the mills and the ocean both contribute to a high background noise level.

Given that the majority of the planning area is closed to OHV use, however, the increased level of noise in this vicinity would be considered to have a minimal impact on the environment.

I. Social

The North Jetty area, and the beach stretch along New Navy Base Road to the power pole site, is used by a wide range of recreational use types. There have been use conflicts in the past between different user groups. Conflicts between user groups could increase by directing additional OHV activity to this site.

Mitigation: Since the majority of the planning area would be for passive recreational uses, redirect passive use elsewhere through means of signing. Manage the area more exclusively for OHV use. A speed limit on the waveslope could be implemented and enforced by ordinance.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions. This alternative would reduce geomorphological effects throughout most of the planning area. This would result in increased stabilization of dune forms. Such an effect could be considered significant but not adverse.

For the primary foredune area from the North Jetty to the power poles which would be designated as an OHV riding area, erosional impacts would significantly increase. The increased erosional impacts could be reduced by implementation of an active trails management plan with design considerations as mentioned above under geological mitigation measures, such as insuring that trails are aligned away from prevailing winds. The level of significance of erosional impacts with active trail management depends largely on the amount of use. Currently at the BLM Samoa Dunes trails area, the use level is low enough that erosion is not a significant concern.

Effects on vegetation for the balance of the planning area under this alternative would be positive. As discussed above, the vegetation is likely to increase over time. Fragmentation of individual stands is likely to be reduced by revegetation of trail cuts. However, without active management, invasives could displace native vegetation in the long term.

Vegetation in the designated riding area from the North Jetty to the power poles would be significantly impacted by mechanical destruction. While the area is primarily composed of European beachgrass and bush lupine, beach layia occurs and individual plants would

be destroyed within the designated riding area. Mitigation measures for this alternative would most likely need to be carried out in consultation with CDFG and USFWS.

Disturbances to wildlife in most dune areas would be substantially reduced under this alternative, except at the expanded riding area. On balance, the anticipated increase in vegetation cover in most areas would likely increase available habitat. This alternative would result in a significant effect on wildlife within the proposed riding area from the North Jetty to the power poles, but would be more than offset by revegetation and reduction in disturbance in the balance of the planning area.

Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed above as part of this alternative, and as part of Alternative #1. Monitoring studies which are included in the mitigation measures, would determine the relative success of such actions and whether or not impacts would remain significant.

Archeological and historical sites under this alternative would no longer be subject to mechanical disturbance. Pedestrian/equestrian use and potential disturbance to archeological/cultural sites would be greatly reduced by the mitigation measure discussed above; therefore no significant impact to cultural sites is identified under this alternative.

Under this alternative, impacts to much of the dune system would be reduced, except in the proposed riding area from the North Jetty to the power poles. The area proposed for OHV riding is already substantially impacted; therefore an expansion of OHV use in this area would not result in a significant loss of high quality habitat. OHV use could however, without proper mitigation, further degrade habitat values of an already fragmented area.

7.54 NORTH SPIT ALTERNATIVE #4 - LP OHV RIDING AREA

A. Overview

This alternative would define a recreational riding area bounded to the South by the LP Power Pole site and the Rudd property, now MCSD, and the Lundblade properties to the north and northeast. OHV use could be accommodated by developing a new public accessway specifically designated for vehicular staging at the LP ranch house site, or at the Power Poles access site off of New Navy Base Rd. Developing this area would provide an approximate maximum total of 140 acres of additional riding area, with approximately 33 acres of open sand. This alternative would include continued use of the BLM Jetty recreation area as it is currently managed. Except for these two areas, vehicular use would

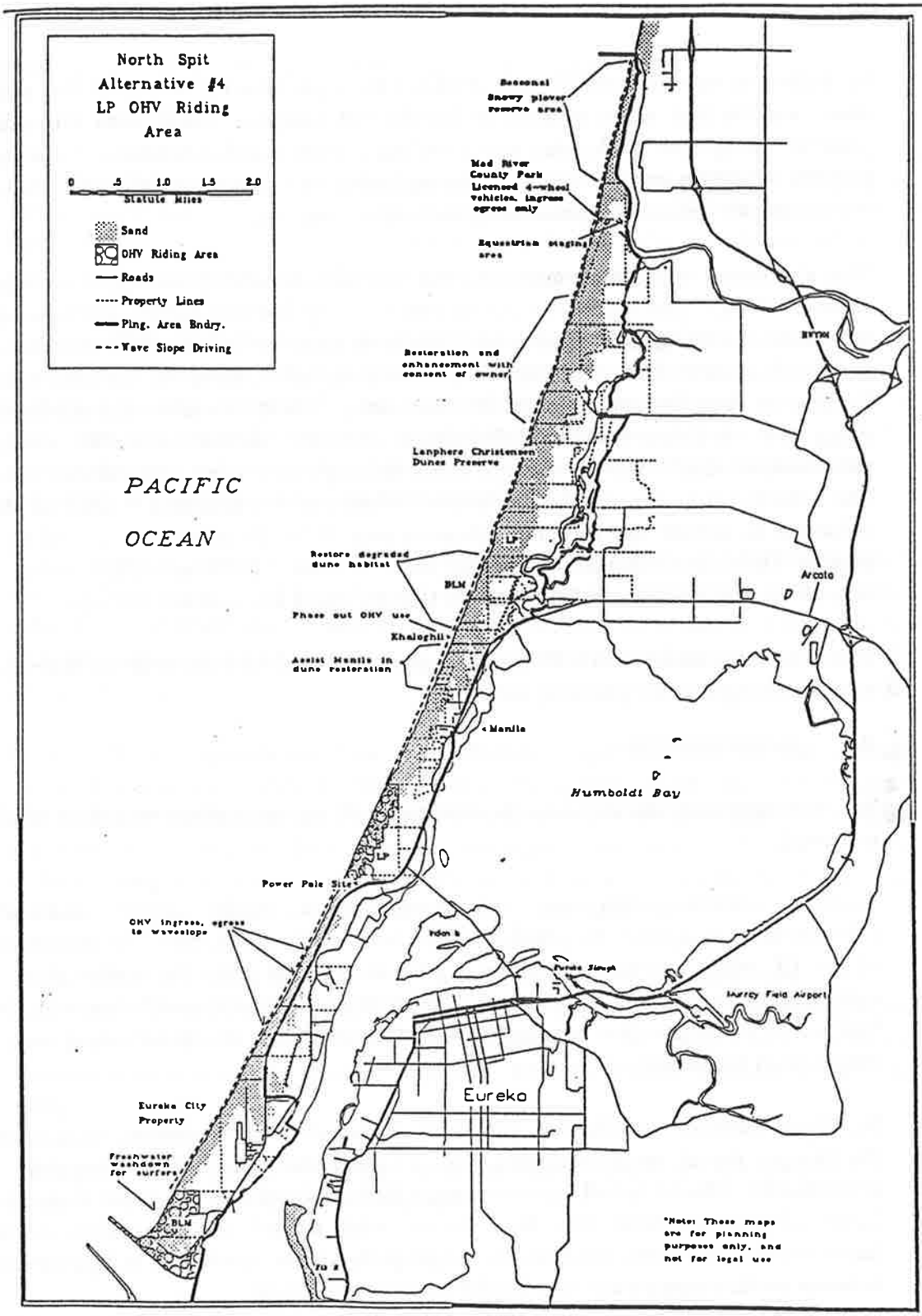


Figure 7.54, North Spit Alternative #4 map

be limited to waveslope driving only at fifteen miles per hour for the rest of the planning area. Vehicle free zones adjacent to Manila and Lanphere-Christensen Preserve are possible sub-options. Pedestrian accessway improvements, enhancement and restoration projects would be carried out in the non-motorized use areas of the planning area. See Alternative #1 for impact discussion of these other areas.

This alternative would concentrate recreational vehicular activity on approximately 140 acres of the LP property (counting inclusion of the Hooper parcel, which would be included in the riding area). This would require an amendment in the LCP to include this additional portion of the North Spit into Public Recreation, along with the Samoa Dunes Recreation Area Site and the tip of the South Jetty. Due to the current popularity of this riding area, together with its challenging terrain, this alternative should adequately accommodate OHV use at its current levels, although on a more concentrated location. This is distinct from the previous alternatives, which could be expected to cause an overall reduction in vehicle use within the planning area. If the LP riding area proved to be a popular OHV recreation area, it could serve to attract additional OHV riding from outside the area and serve as an overnight stop for riders from outside the area.

This alternative would substantially reduce impacts of vehicular use to the balance of dune habitats throughout the planning area.

B. Implementation

See Implementation discussion under Alternative #1 for areas where waveslope driving is proposed.

Effective implementation and enforcement would require on-site and off-site enforcement throughout the planning effort, and would require park-like improvements to the LP riding area similar to those in place at the BLM Jetty Recreation Area. It is estimated that a minimum of three patrol personnel would be required to cover the North Spit under this alternative: one for the BLM Jetty Area, one for the LP riding area, and one to cover the balance of the area.

Significant funding would be required for development of improvements, acquisition of the Hooper parcel, monitoring programs, on-site restoration, off-site mitigation, and enforcement. Most if not all such costs might likely be funded by the OHV Commission. Since LP has indicated that they do not wish to sell their property, extensive improvements with public funds on private property may be a problem. A legal agreement between participating parties may be able to address the issue.

Fencing would be required for all resources warranting protection.

C. Geological

Assuming this alternative is effectively implemented, substantial reduction of active trail cutting would occur in much of the planning area, except at the BLM area at the North Jetty and at the proposed LP OHV riding area. Please refer to Alternative #1 for geological impacts associated with the balance of the planning area.

Geological impacts at the proposed LP OHV area would be significant, if vehicle use were not managed to protect dune forms. Even with active management, significant loss of existing dune forms might still occur. A complete set of geomorphological dune forms exist, from beach strand, primary foredune, foredune complex, deflation plain, parabolic dunes and ridges, and older forested paleodunes. These dune forms could lose their form completely if unprotected from concentrated vehicle use.

The current integrity of the dune forms in this area is substantially degraded from multiple trail cutting. This area has more trail cuts per acre than any other section in the planning area. Current vehicle use is estimated roughly at 5,000 to 10,000 user days per year, with peak use days at about 30 to 50 vehicles. Typical weekend use is estimated at about 5 to 20 users per day.

Most of this use spreads out from the deflation trough, criss-crossing the secondary foredune complex and primary foredune ridge. This activity accentuates the hummocky topography of the foredune complex and cuts sand transport paths through this zone. For the most part this does not appear to have yet triggered large scale sand transport inland to form new parabolic dune sheets or major blowout areas. Higher levels of unmanaged vehicular use would likely be capable of triggering such transport.

Under this proposal a managed network of trails and open riding areas would be established. There are currently far more trail cuts than would be appropriate for a managed network of trails. Under moderate use levels (i.e. those that occur now), a substantial reduction in the number of trail cuts could be achieved and still accommodate riding.

Mitigation: The Pacific Watershed study identifies mitigation recommendations to protect and manage the foredune complexes.

Mitigation: Loss of dune forms would be offset by closure of other areas. Any specific dune forms considered for retention could be fenced. Rotating closures could be utilized to allow eroding dune forms the opportunity to restabilize.

D. Vegetation

This discussion focuses on the approximately 140 acres of dune area north of the power poles proposed under this alternative as an OHV riding area. See other Alternatives for specific discussions on the balance of the planning area.

This 140 acres of dunes area consists of approximately 22 acres of beachgrass, 44 acres of dune mat, 14 acres of lupine, 27 acres of hollows, and 33 acres of open sand. The acreages should be considered somewhat generalized. These habitats are substantially degraded by high numbers of trail cuts. For instance, of the approximate 44 acres of dune mat, about 30 to 40% of the mapped area consists of trail cuts.

The primary foredune in this area is mainly European beachgrass, although there are some areas to the north where dune mat is dominant on the primary foredune face. Dune mat is dominant behind the primary foredune face in most areas of this section.

The deflation plain trough is accentuated by the pipeline trail corridor running the length of the area. Approximately 27 acres of dune hollows occur here.

Mitigation: Prepare a trails plan which avoids the maximum feasible amount of dune mat and dune hollows. Provide both on-site and off-site restoration of these habitats. Align open riding areas to avoid such habitats. Utilize original 1"=200' color stereo pair photos and additional on-site surveys to prepare the plan.

Mitigation: Provide off-site mitigation of rare plant habitat included in active riding area.

Of the three documented rare plants, numbers are available only for Menzies' wallflower. The population estimate for the southern Manila area was 1499 (+/-662 with a 95% confidence interval) as of 1988, with some portion of this number outside of the affected area. The total population on the North Spit was estimated at 20,679 plants (+/-4691 95% C.I.) (Andre, 1988).

The number of Menzies within the LP dune area is significant in terms of the total population. In addition, their location as the southern-most concentration north of the jetty population increases their importance in terms of the species' range and survival.

Therefore, any population reductions of plants in this area will likely be considered significant and unacceptable by listing agencies.

Mitigation: Undertake restoration efforts in fenced off dune mat habitat to manage for rare plants.

Mitigation: Fence additional stands of Menzies' which may occur in habitats other than dune mat.

It likely not feasible to fence every individual Menzies'. In such cases reseeding and restocking of newly restored areas may be more appropriate mitigation than relocation of individuals.

Mitigation: Conduct annual planning area wide Menzies' population counts with direct censuses in the LP/Hooper dune area. Manage to increase populations.

For beach layia, it is locally common and has relatively high population numbers. Its occurrence is somewhat patchy, tending to favor sparsely vegetated semi-stabilized areas. Its preferred habitat is dune mat. It also occurs along the margins of lupine, herbaceous hollows, trails, and open actively moving sand areas. It is not feasible to fence and protect every individual, be it from OHV's or pedistrian trampling without full closure. On the other hand, as an annual with locally high population numbers, it is not as significantly at risk as Menzies' from occasional losses of individuals.

Mitigation: Conduct annual planning area wide beach layia population counts with higher density sampling in the LP/Hooper dune area. Manage to increase populations.

Pink sandverbena is an additional species of concern. Its occurrence is quite limited in the planning area. As a perennial, its occurences are fairly well defined and more easily managed.

In addition to the dune area mentioned above, the balance (60%) of the LP area is forest habitat. This area has been considered the southern most occurence of beach pine sitka spruce forest. Some past degradation has occurred by vehicular activity and non-native species; however, the area still maintains high resource values.

Mitigation: Develop a forest trails managements plan for pedestrian use. Reduce random trail cuts and provide interpretive and erosion control improvements.

E. Wildlife

This alternative would result in potentially significant impacts to wildlife adjacent to the proposed riding area, particularly in terms of noise. See Noise section below. The LP forest section of the planning area is composed of 60% forested habitat, which Theiss and Assoc.(1992) designated as one of the most significant wildlife areas. The open sand areas are also utilized as corridors between habitat types for wildlife species, and concentrated vehicle use could impede movement and disrupt use. Potential habitat for the white footed vole exists, but there are no documented occurrences for this particular area. The red legged frog, a species of concern which has been found to be breeding successfully in ephemeral pools in the planning area may also occur in this area. Any increase in human use, particularly camping activity, could potentially result in increased numbers of rodents and feral animals.

A high tide roost was located just south of the power pole site.

Mitigation: Implement hours of operation between 8:00 a.m. to 5:00 p.m. and close riding areas to all OHV use at other times to allow wildlife the opportunity to move from one habitat type to another.

Open sand areas are utilized by Bembix, Microbembix, and Megachile species. If OHV use is concentrated in these areas it is likely that these invertebrate species will be subject to impacts.

Mitigation: Fence areas where invertebrate species are nesting, removing fencing once the nesting cycle has been completed.

Mitigation: Conduct a systematic field survey to determine presence/absence of the white footed vole in the woody hollows.

Mitigation: Provide animal-proof garbage receptacles with convenient and visible locations with regular pick-up

F. Ecosystem Function

Under this alternative, significant impacts may occur to the ecological integrity of the area at higher levels of use. This area is recognized to be the southern most occurrence of beach pine sitka spruce forest. Although some disturbance has taken place, habitat values still exist. This area probably represents the southernmost end of the wildlife corridor.

Even if wildlife does migrate south, it is severely restricted beyond this point due to human disturbance and lack of habitat. An OHV park in this location may cause further fragmentation of whatever potential links have been maintained with the North Jetty area resulting in further isolation. Such isolation would be less likely to be replenished by mainland species.

Nevertheless, because of the current degree of degradation of the dune area, substantial opportunity exists for habitat improvement while still accommodating vehicle use.

G. Cultural

This alternative would not impact areas of known cultural significance. However, because adjacent areas are known to have cultural sensitivity, the potential for impacts exist.

Mitigation: Prior to finalizing a plan for development, conduct a site specific survey of the area to ensure that cultural values are protected.

Mitigation: Conduct monitoring as deemed necessary by an archeologist/cultural specialist to ensure that any areas designated as open to OHV use are regularly checked for potential exposure of culturally sensitive sites.

H. Noise

This alternative would cause significant off-site noise impacts to wildlife habitat. Although OHV use would be concentrated on the open dune areas, noise generated by OHV's would carry into areas that were identified as significant wildlife habitat by Karen Theiss and Associates in the wildlife report that was prepared for the County, such as the hollows, dune swamp, and coniferous forest.

Although it has been noted in some areas wildlife are known to become conditioned to high noise levels, other effects have been documented, such as vehicle noise disrupting nesting, and impairing hearing development (Theiss & Assoc. 1992). Severe stress reaction in wildlife to noise has also been documented by researchers, "The animals' hearts showed marked weight increases, while the overall body weight declined and the adrenals, ovaries, and kidneys shrank. The study concluded that the body responds to this type of stress in such a manner as to alter significantly both the biochemistry and the anatomy" (Baldwin and Stoddard 1973).

This alternative would also potentially cause impacts on the users of the CMA pedestrian access trails and the community of Manila. Some vehicle run-up and open sand riding

areas are directly adjacent to the passive use areas of the CMA. The juxtaposition of these two uses creates a high potential for annoyance.

Given that prevailing winds are generally from the northwest during the peak recreational season, OHV noise could carry to Manila if the conditions were right. However, topography is generally hilly and such dune forms would dissipate noise to a large degree that might carry from such a sight to the residential area.

Mitigation: Institute vehicle noise standards for recreational vehicles utilizing the OHV park to eliminate noisier vehicles.

Mitigation: Subject to existing law, require mufflers which are consistent with the equipment manufacturers' specifications.

Mitigation: Maintain a test station, instrumentation, and trained personnel as needed to enforce noise standards.

Mitigation: Set a 50-100 car limit on the number of vehicles able to utilize the park at any one time.

Mitigation: Ensure that adequate buffers are formed adjacent to the staging, vehicle run-up,steep uphill grades, and riding areas so that noise intrusion into other areas is minimized as much as possible.

Mitigation: Ensure that dune forms between the proposed riding area and the community of Manila are stabilized to the degree possible by fencing and use restrictions to maintain a noise buffer.

I. Social

Providing a designated riding area at the LP/Hooper site would provide challenging terrain, good trail riding, and some hill climbing opportunities. The open sand areas are less extensive than those in the vicinity of the CMA, although it might be feasible to manage for some additional open sand areas by so designating some of the more highly disturbed vegetated areas.

This area currently provides most of the desired recreational riding experience for non-club riders in the area. This alternative would displace club riders from the Khaloghli - BLM area. If the ranch house were developed as a staging area, it would provide security and potential overnight accommodations similar to what the club riders have at the

Khaloghli site. Since it does not appear now that the ranch house site would be available for such a use, this accommodation would be displaced, but may be workable by reservation camping at the BLM Jetty recreation area. Riders would then need to tour north along the waveslope at 15 mph to reach the LP/Hooper area.

This alternative does locate the recreational riding area in the more impacted areas, with less separation than Alternatives #5 and #6. It provides a more contiguous undisturbed dune area through Manila north to the Mad River. Adopting the sub-option of designating vehicle free zones in these areas to the north would provide an even better separation of uses.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions; therefore since this alternative would reduce effects, impacts would be considered insignificant on large scale dune geology. In the active riding area, impacts would be reduced to small scale and manageable disturbances, provided the identified mitigation is implemented. Area closures may be required this result.

Effects on vegetation under this alternative would be considered potentially significant; the amount of dune mat, dune hollows and rare plant populations in the LP riding area proposed under this alternative are too substantial to say that there would be no risk of harm. However such impacts, with appropriate mitigation and management as identified, can likely achieve a net positive result. This will require some flexibility on the part of responsible agencies to accept some off-site mitigation and to allow management of vegetation stands into less fragmented units.

Fragmentation of individual stands is likely to be reduced by revegetation of trail cuts. More importantly, the reduction in fragmentation of an expansive area including Manila, the CMA area, the Lanphere-Christensen Preserve area and north, would provide a substantial net positive result over current conditions. However, a high level of active management would be required in the LP riding area to reduce adverse impacts to an insignificant level.

Disturbances to wildlife in most dune areas would be substantially reduced under this alternative. An anticipated increase in vegetation cover in much of the planning area would likely increase available habitat.

In the proposed riding area, of critical importance will be the levels of use and hours of operation. If the ranch house site is utilized as a staging area, impacts to wildlife in the

surrounding forest area would be higher than if the staging area were at the Power Poles site.

This alternative would not result in a significant effect on wildlife in most areas, and would more likely enhance such values. Impacts at the riding area could become significantly adverse if the level of use increases dramatically.

Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed above as part of this alternative. Monitoring studies which are included in the mitigation measures, would determine the relative success of such actions and whether or not impacts are significant.

Archeological and historical sites and areas of known sensitivity under this alternative would no longer be subject to mechanical disturbance. Pedestrian/equestrian use and potential disturbance to archeological/cultural sites would be greatly reduced by the mitigation measure discussed above; therefore no significant impact to cultural sites is identified under this alternative.

Under this alternative, impacts to much of the dune system would be reduced. This alternative would act to concentrate recreational driving to two specific locations, separated by a highly impacted area. From an ecological and land use standpoint, the locations of these areas are less intrusive and more easily managed than the Alternative #5 and #6 proposals.

7.55 NORTH SPIT ALTERNATIVE #5 - PUBLIC OHV RIDING AREA ON THE KHALOGHLI, BLM, AND LP PARCELS

A. Overview

This alternative proposes to make a public OHV use area bounded by the south by the Khaloghli property, and to the north by the open sand areas encompassed by the CMA. This discussion assumes to focus on this alternative as an isolated element, without inclusion of the sub-options. Within this defined area, currently there exists 95 acres of open sand, of the total 240 acres. This alternative would include continued use of the BLM Jetty recreation area as it is currently managed. These two areas would provide OHV riding opportunities above the waveslope. Vehicle free zones would be provided for in the vicinity of Manila and north of Mad River County Park. The rest of the planning area would provide waveslope driving only. See Alternative #1 for impact discussion of these other areas.

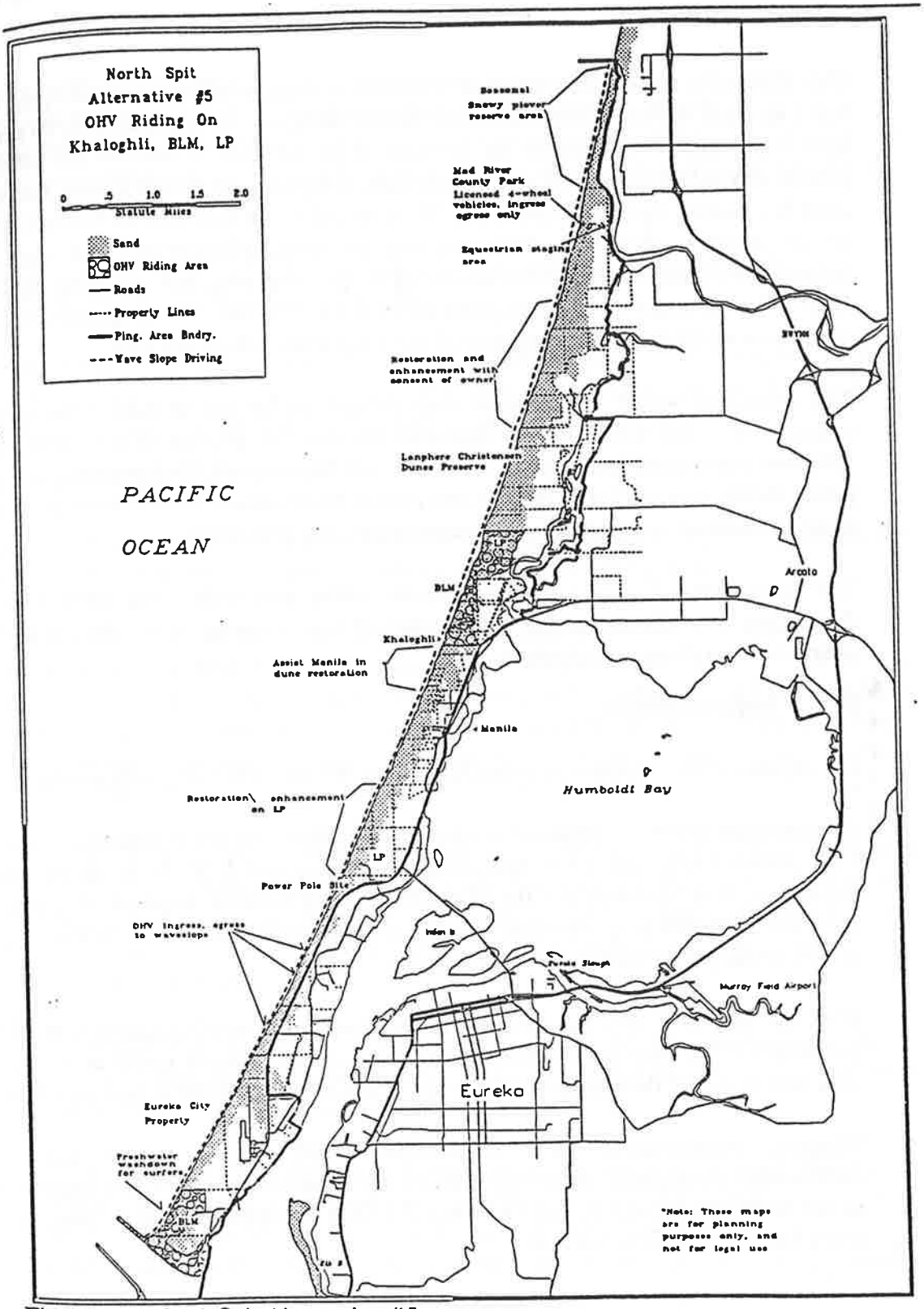


Figure 7.55, North Spit Alternative #5 map

This alternative would accommodate vehicular activity, providing a challenging OHV riding area and increasing the amount of planned riding area by approximately 95 acres of open sand. This would require an amendment in the LCP to include this additional portion of the North Spit into public recreation, along with the Samoa Dunes Recreation Area Site and the tip of the South Jetty. There would be the potential for both on-site and off-site impacts. Pedestrian accessway improvements, enhancement and restoration projects would be carried out for the rest of the planning area, not including the North Jetty riding area and the area proposed under this alternative. The designation of a new riding area would likely attract additional OHV use from outside the area.

This alternative would reduce some impacts of vehicular use to dune habitats of the planning area, but would have a significant affect on this portion of the dune system. Effective implementation and enforcement would require park-like improvements to this public riding area, similar to those in place at the BLM Samoa Dunes Recreation Area. Fencing would be required for all resources warranting protection.

This discussion will focus on the proposed riding area under this alternative. See Alternative #1 discussion for the balance of the planning area. See appropriate alternatives for discussion of sub-options.

B. Implementation

See implementation discussion under Alternative #1 where the proposals are the same.

As mentioned above, the proposal to create a new riding area would require amending the LCP. Active OHV use is not consistent with the current LCP. In terms of potential acquisition, it is not likely that the Khaloghli property could be acquired at the present time. The Khaloghli property could however continue to be used as the OHV staging area and be developed for that purpose under lease.

BLM has indicated that the outcome of this plan will determine future uses of their property. LP has also notified the County that they would like to continue to allow off road vehicle use on their property. Redwood Gun Club would need to be a participant.

Effective implementation and enforcement would require on-site and off-site enforcement throughout the planning effort, and would require park-like improvements to the Khaloghli, BLM, LP, and Redwood Gun Club riding area similar to those in place at the BLM Jetty Recreation Area.

It appears reasonable to assume that the OHV Commission would provide funding for off-site and on-site patrol. A minimum of one on-site patrol person at each riding area may be needed, as well as one off-site patrol to effectively cover the North Spit. If adequate monies are not available for beach patrol, alternative sources of funding may need to be explored.

Mitigation: In the event that grant funding is not available, implement a user fee at the OHV park to ensure that adequate funding is available.

Although it is reasonable to impose such a fee for OHV use and development of the area, it may increase off-site impacts from those who are not willing to pay the fee. Without enforcement funding, implementing a closure may be problematic.

C. Geological

As a proposed public area, this Alternative is likely to increase impacts by raising use levels in accommodating the general public rather than defined groups.

This area is known for the dunes/slough complex, where a complete set of geomorphological dune forms exist. The current integrity of dune forms in this area is high, and remains relatively intact and undisturbed, much of which is in the form of large open sand sheets. These areas are considered least susceptible to disturbance, although sand hummocks and outcroppings of paleosoils would be quickly destroyed by OHV use unless protected.

There are also large areas of foredune as well as dune ridges; these areas react differently to OHV use and would be subject to significant impacts from OHV riding if unprotected. Even with active management, significant loss of existing dune forms, such as dune ridges, might still occur. These dune forms could lose their form completely if unprotected from concentrated vehicle use.

Most of the OHV use spreads out from the deflation plain, up on to the open sand sheets. OHV's could effect the dune geomorphology in essentially two ways; by increasing rates of sand movement, or modifying dune forms.

The large parabolic dune fronts already experience sand movement inland; the average movement rate for parabolic dune fronts from 1988-1991 was 7.8 ft./yr. It is not likely that OHV use that currently takes place has accelerated sand movement; the movement rate from 1939-1988 was 8.0 ft./yr. Transverse dunes appear to exhibit similar characteristics. Higher levels of use may result in higher rates of sand movement, but it does not appear

that in the case of the large open sand sheets that these changes in movement rates due to OHV use will be significant. It would be more likely for the foredune area and for dune ridges to experience changes in rates of sand movement inland due to OHV use, particularly if oriented with prevailing winds which could cause blowouts.

The modification of dune forms due to mechanical disturbance by OHV's is least likely on those forms which also showed little or no change in sand movement (parabolic dune fronts, transverse dunes) as well as active sand sheets and deflation plains. They appear to have a lower erosional susceptibility to disturbance. OHV use would be less likely to result in a significant impact to these dune forms.

There are other dune forms which have a much higher erosional susceptibility that would be significantly impacted by OHV use; the primary and inland foredune area and the marginal ridges are all considered highly susceptible to disturbance. These dune forms would be subject to significant impacts by OHV use if riding areas were to include these dune forms.

Mitigation: Sign and fence the most sensitive dune forms that would be susceptible to erosional impacts. Utilize rotating closures on other dune forms, determining time of closure by means of fixed photo points that can assess the rate of erosion.

Mitigation: If specific trails are considered necessary through sensitive dune forms, orient trails through the foredune, away from the prevailing winds so as to discourage the formation of blowouts.

Mitigation: In addition to active management, limit number of users to control erosional impacts to dune forms.

Mitigation: Require training of users prior to allowing use of the area to increase awareness of environmental concerns.

D. Vegetation

This alternative would, if effectively implemented, substantially reduce or eliminate disturbance to the vegetated dunes throughout the planning area, except at the BLM/Samoa Dunes Recreation Area and at the proposed public OHV Riding Area on the Khaloghli, BLM, Redwood Gun Club and LP parcels. This discussion focuses on the proposed riding area. See Alternative #1 discussion for the balance of the planning area.

The total dune system consists of 400 acres, 240 acres of which is the open sand and foredune area. Of the various habitat types in this location, there are approximately 36 acres of European beachgrass, 69 acres of dune mat, 28 acres of lupine, and 21 acres of hollows. Trail cuts are comparatively minimal at present; the area could be considered largely undisturbed.

East of the foredune, there are 33 acres of dune swamp, 117 of coniferous forest, and 62 acres of salt marsh. The acreages should be considered somewhat generalized. As reflected in these habitat types, this area is a portion of a dune-slough ecosystem. These vegetation values however, would not be significantly impacted by OHV use since riding would not be in these areas.

There are three documented rare plants in the foredune area; Menzies' wallflower (*Erysimum menziesii*), beach layia (*Layia carnosa*), and pink sandverbena (*Abronia umbellata, ssp. breviflora*). Depending on the degree to which OHV riding is allowed in the foredune area, these plant species may be significantly impacted.

The USFWS made the following comment to BLM in reviewing management for the BLM parcel: "Given this situation and the critical status of the Menzies wallflower, the BLM should undertake only those actions ensuring the long term survival of the wallflower on both public and private lands on Samoa Peninsula (i.e., seek closure of the area to ORV's)."

If OHV riding was allowed, impacts would occur initially by mechanical destruction of plants, which once removed could fragment the population and prevent gene flow. This could result in significant impacts to the populations of rare plants.

Mitigation: Prepare a trails plan which avoids the maximum feasible amount of dune mat and dune hollows.

Mitigation: Provide off-site mitigation of rare plant habitat included in active riding area.

Mitigation: Fence the foredune area in order to protect populations of Menzies', beach layia, and pink sandverbena, ensuring adequate buffer as well as corridors to adjacent areas are maintained for gene flow. Provide both on-site and off-site restoration of these habitats. Align open riding areas to avoid such habitats. Utilize original 1"=200' color stereo pair photos and additional on-site surveys to prepare the plan.

Mitigation: Conduct annual monitoring plan for rare plant species to determine the relative viability of the population in any given year.

E. Wildlife

This alternative would result in significant impacts to wildlife adjacent to the proposed riding area, particularly in terms of noise. See Noise section below. The open sand areas are also utilized as corridors between habitat types for wildlife species, and concentrated vehicle use could impede movement and disrupt use patterns.

Although there are no documented occurrences of white footed vole in this particular area, one was found to the north. The riparian forest surrounding Iron Creek and the woody hollows are of high value for wildlife, and likely habitat for the white footed vole, a species of special concern. The red legged frog, also a species of concern, has been documented in the vicinity, and would likely be found in ephemeral pools.

Any increase in human use, particularly use associated with camping, could increase the populations of rodents and feral animals which are known to effect wildlife.

Mitigation: Conduct site specific study to determine presence/absence of the red legged frog in dune hollows and ephemeral pools. Areas with documented occurrences would be fenced and posted, potentially on a seasonal basis.

Mitigation: Institute vehicle noise standards to lower disturbance on wildlife.

Mitigation: Implement hours of operation between 8:00 a.m. to 5:00 p.m. and close riding areas to all OHV use at other times to allow wildlife the opportunity to move from one habitat type to another.

Mitigation: Provide animal proof garbage receptacles with convenient and visible locations with regular pickup.

Open sand areas are utilized by Bembix, Microbembix, and Megachile species. If OHV use is concentrated in these areas it is likely that these invertebrate species will be subject to some impacts.

Mitigation: Fence areas where invertebrate species are nesting, removing fencing once the nesting cycle has been completed.

F. Ecosystem Function

Under this alternative, there would be significant risk of impacts to the ecological integrity of the area. This area is recognized to be a portion of a dune-slough ecosystem, which has

large undisturbed areas. Continuation and increase of OHV use in this location may cause fragmentation and long term damage to the various biological components, that until now have been fragmented primarily due to residential development to the south. This could further impede the migration of plant and animal species down the spit, as well as isolating those south of this location. The park-like improvements would add additional human disturbances and presence to this area. It is also contiguous with Lanphere Christensen Dunes Preserve, and OHV use would not be compatible with the elements the Nature Conservancy is seeking to preserve.

G. Cultural

This alternative would impact areas of cultural significance. In addition to areas presently exposed, OHV riding would have the potential to erode sands away, subjecting unknown sites to mechanical destruction.

Mitigation: Prior to finalizing a plan for development, conduct a site specific survey of the area to ensure that cultural values are protected.

Mitigation: Conduct monitoring as deemed necessary by an archeologist/cultural specialist to ensure that any areas designated as open to OHV use are regularly checked for potential exposure of culturally sensitive sites.

H. Noise

This alternative would cause significant off-site noise impacts to wildlife habitat. Although OHV use would be concentrated on the open dune areas, noise generated by OHV's would carry into areas that were identified as significant wildlife habitat by Karen Theiss and Associates in the wildlife report that was prepared for the County, such as the hollows, dune swamp, and coniferous forest. Although it has been noted in some areas become conditioned to high noise levels, other effects have been documented, such as vehicle noise disrupting nesting, and impairing hearing development (Theiss & Assoc. 1992). Severe stress reaction in wildlife to noise has also been documented by researchers, "The animals' hearts showed marked weight increases, while the overall body weight declined and the adrenals, ovaries, and kidneys shrank. The study concluded that the body responds to this type of stress in such a manner as to alter significantly both the biochemistry and the anatomy" (Baldwin and Stoddard 1973).

This alternative would also potentially cause impacts on the users of the CMA pedestrian access trails and the community of Manila. Some vehicle run-up and open sand riding areas are directly adjacent to the passive use areas of the CMA. The juxtaposition of these two uses creates a high potential for annoyance.

Given that prevailing winds are generally from the northwest during the peak recreational season, OHV noise could carry to Manila if the conditions were right. However, topography is generally hilly and such dune forms would dissipate noise to a large degree that might carry from such a sight to the residential area.

Mitigation: Institute vehicle noise standards for recreational vehicles utilizing the OHV park to eliminate noisier vehicles.

Mitigation: Subject to existing law, require mufflers which are consistent with the equipment manufacturers' specifications.

Mitigation: Maintain a test station, instrumentation, and trained personnel as needed to enforce noise standards.

Mitigation: Set a 50-100 car limit on the number of vehicles able to utilize the park at any one time.

Mitigation: Ensure that adequate buffers are formed adjacent to the staging, vehicle run-up, steep uphill grades, and riding areas so that noise intrusion into other areas is minimized as much as possible.

Mitigation: Ensure that dune forms between the proposed riding area and the community of Manila are stabilized to the degree possible by fencing and use restrictions to maintain a noise buffer.

I. Social

Under this alternative, OHV use would be accommodated by providing challenging terrain with high scenic values. Passive recreationalists seeking to utilize the existing Cooperative Management Area may go elsewhere. However, since waveslope driving would be provided for throughout the planning area, passive recreationalists may have difficulty in finding quiet areas. OHV riders who have been riding at the OHV park and leave the area for the waveslope may also have difficulty in adjusting their riding style to accommodate other user groups.

Mitigation: Confine OHV riders to the OHV park itself. This may also in part address the concern regarding off-site impacts.

Mitigation Implement vehicle free zones along the community of Manila and the Lanphere Christensen Dunes Preserve.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions; therefore since this alternative would reduce effects, impacts would be considered insignificant on large scale dune geology. In the active riding area, impacts would be reduced to small scale and manageable disturbances, provided identified mitigation is implemented. Area closures may be required this result.

Effects on vegetation under this alternative would be considered potentially insignificant if OHV riding was restricted to the open sand areas, and any native plants that were to colonize the periphery of the open sand areas in the future were also protected by fencing.

Other potential impacts, with appropriate mitigation and management as identified, can likely achieve a net positive result. This will require some flexibility on the part of responsible agencies to accept managing of preferred stands to reduce fragmentation and possibly some off-site mitigation.

Fragmentation of Menzies' wallflower and beach layia are likely to be reduced by revegetation of trail cuts. OHV riding would take place on open sand areas adjacent to rare plant habitat, which may inhibit redistribution and potential movement among populations from year to year. More importantly, there would be a reduction in fragmentation of two large areas including the LP forest and Manila areas, and the Lanphere-Christensen Preserve.

However, a high level of active management would be required in the Khaloghli riding area to reduce adverse impacts to an insignificant level.

Disturbances to wildlife in most dune areas would be substantially reduced under this alternative. An anticipated increase in vegetation cover in much of the planning area would likely increase available habitat.

In the proposed riding area, of critical importance will be the levels of use and hours of operation. Impacts at the riding area could become significantly adverse if the level of use increases dramatically.

Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed above as part of this alternative. Monitoring studies which are included in the mitigation measures, would determine the relative success of such actions and whether or not impacts are significant.

Archeological and historical sites and areas of known sensitivity under this alternative would be subject to mechanical disturbance unless identified mitigation is carried out.

Under this alternative, impacts to much of the dune system would be reduced. This alternative would act to concentrate recreational driving to two specific locations. The separation of these areas, from an ecological and land use standpoint, is somewhat intrusive and more difficult to manage than the Alternative #4 proposal.

In terms of growth inducing impacts, this alternative could further vest and substantiate OHV use within the planning area.

7.56 ALTERNATIVE #6 - PRIVATELY MANAGED OHV RIDING AREA ON THE KHALOGHLI, BLM, AND LP PARCELS

A. Overview

This alternative proposes to make a privately managed OHV use area bounded by the south by the Khaloghli property, and to the north by the open sand areas encompassed by the CMA. This discussion focuses on this proposed riding area. Within this defined area, currently there exists 95 acres of open sand, of the total 240 acres. This alternative would include continued use of the BLM Jetty recreation area as it is currently managed. These two areas would provide OHV riding opportunities above the waveslope. Vehicle free zones would be provided for in the vicinity of Manila and north of Mad River County Park. The rest of the planning area would provide waveslope driving only. See Alternative #1 for impact discussion of these other areas.

This alternative would accommodate limited vehicular activity, providing a challenging OHV riding area and increasing the amount of planned riding area by approximately 95 acres of open sand. This would require an amendment in the LCP to include this additional portion of the North Spit into a Public Recreation land use designation, along with the Samoa Dunes Recreation Area and the tip of the South Jetty. There would be

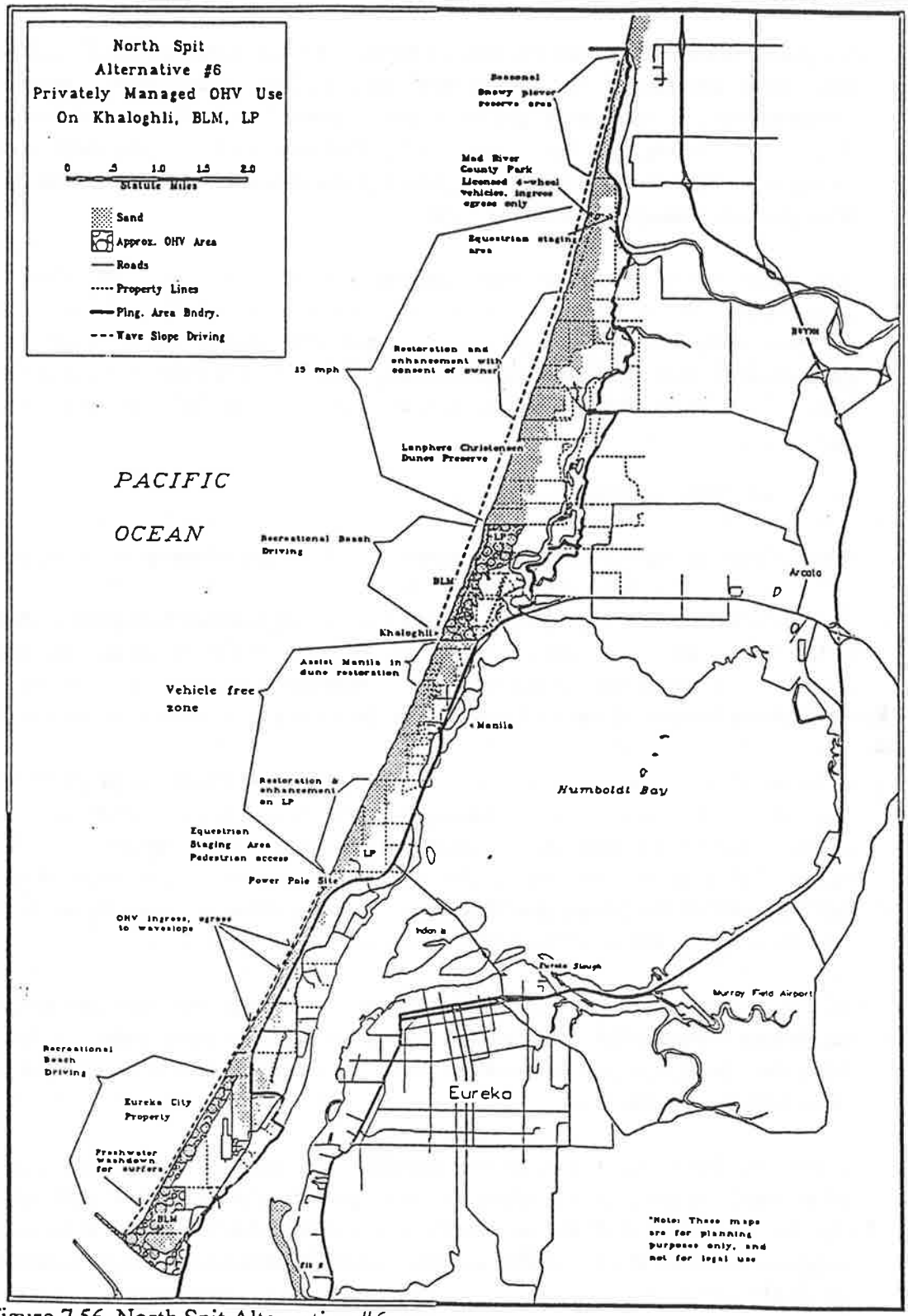


Figure 7.56, North Spit Alternative #6 map

the potential for both on-site and off-site impacts, but they would be less likely than if the area were completely open to public use. Pedestrian accessway improvements, enhancement and restoration projects would be carried out for the rest of the planning area, not including the North Jetty riding area and the area proposed under this alternative. The designation of a new privately managed riding area would likely attract additional OHV use from outside the area.

This alternative would reduce some impacts of vehicular use to dune habitats of the planning area, but would perpetuate what is likely a significant effect on this portion of the dune system. Effective implementation and enforcement would require park-like improvements to this privately managed riding area, similar to those in place at the BLM Dunes Recreation Area. Fencing would be required for all resources warranting protection.

B. Implementation

See implementation discussion under Alternative #1 where the proposals are the same.

As mentioned above, the proposal to create a new riding area would require amending the LCP. Active OHV use is not consistent with the current LCP; however, this would not result in a change of current use patterns. Determination of the status of this use would need to be addressed in nonconforming use sections of any ordinances that were adopted.

In terms of potential acquisition, it is not likely that the Khaloghli property could be acquired at the present time. The Khaloghli property could however continue to be used as the OHV staging area and be developed for that purpose under lease. BLM has indicated that the outcome of this plan will determine future uses of their property. LP has also notified the County that they would like to continue to allow off road vehicle use on their property. Redwood Gun Club would need to be a participant.

Effective implementation and enforcement would require on-site and off-site enforcement throughout the planning effort, and would require improvements to the Khaloghli, BLM, LP, and Redwood Gun Club riding area similar to those in place at the BLM Jetty Recreation Area.

It appears reasonable to assume that the OHV Commission would provide funding for off-site and on-site patrol. A minimum of one on-site patrol person at each riding area may be needed, as well as one off-site patrol to effectively cover the North Spit. If adequate monies are not available for beach patrol, alternative sources of funding would need to be explored.

Mitigation: In the event that grant funding is not available, implement a user fee at the OHV park to ensure that adequate funding is available.

Although it is reasonable to impose such a fee for OHV use and development of the area, it may increase off-site impacts from those who are not willing to pay the fee, and those who do not belong to the club. Without enforcement funding, implementing a closure may be problematic.

C. Geological

This discussion will focus on the proposed riding area under this alternative. See Alternative #1 discussion for the balance of the planning area. See appropriate alternatives for discussion of sub-options.

This area is known for the dunes/slough complex, where a complete set of geomorphological dune forms exist. The current integrity of dune forms in this area is high, and remains relatively intact and undisturbed, much of which is in the form of large open sand sheets. These areas are considered least susceptible to disturbance, although sand hummocks and outcroppings of paleosoils would be quickly destroyed by OHV use unless protected.

Most of the OHV use spreads out from the deflation plain, up on to the open sand sheets. OHV's could effect the dune geomorphology in essentially two ways; by increasing rates of sand movement, or modifying dune forms.

The large parabolic dune fronts already experience sand movement inland; the average movement rate for parabolic dune fronts from 1988-1991 was 7.8 ft./yr. It is not likely that OHV use that currently takes place has accelerated sand movement; the movement rate from 1939-1988 was 8.0 ft./yr. Transverse dunes appear to exhibit similar characteristics. Higher levels of use may result in higher rates of sand movement, but it does not appear that in the case of the large open sand sheets that these changes in movement rates due to OHV use will be significant. It would be more likely for the foredune area and for dune ridges to experience changes in rates of sand movement inland due to OHV use, particularly if oriented with prevailing winds which could cause blowouts.

The modification of dune forms due to mechanical disturbance by OHV's is least likely on those forms which also showed little or no change in sand movement (parabolic dune fronts, transverse dunes) as well as active sand sheets and deflation plains. They appear to have a lower erosional susceptibility to disturbance. OHV use would be less likely to result in a significant impact to these dune forms.

There are other dune forms which have a much higher erosional susceptibility that would be significantly impacted by OHV use; the primary and inland foredune area and the marginal ridges are all considered highly susceptible to disturbance. These dune forms would be subject to significant impacts by OHV use if riding areas were to include these dune forms.

Mitigation: Sign and fence the most sensitive dune forms that would be susceptible to erosional impacts. Utilize rotating closures on other dune forms, determining time of closure by means of fixed photo points that can assess the rate of erosion.

Mitigation: If specific trails are considered necessary through sensitive dune forms, orient trails through the foredune, away from the prevailing winds so as to discourage the formation of blowouts.

Mitigation: In addition to active management, limit number of users to control erosional impacts to dune forms.

D. Vegetation

This alternative would, if effectively implemented, substantially reduce or eliminate disturbance to the vegetated dunes throughout the planning area, except at the BLM/Samoa Dunes Recreation Area and at the proposed public OHV Riding Area on the Khaloghli, BLM, Redwood Gun Club and LP parcels. This discussion focuses on the proposed riding area. See Alternative #1 discussion for the balance of the planning area.

The total dune system consists of 400 acres, 240 acres of which is the open sand and foredune area. Of the various habitat types in this location, there are approximately 36 acres of European beachgrass, 69 acres of dune mat, 28 acres of lupine, and 21 acres of hollows. Trail cuts are comparatively minimal at present; the area could be considered largely undisturbed.

East of the foredune, there are 33 acres of dune swamp, 117 of coniferous forest, and 62 acres of salt marsh. The acreages should be considered somewhat generalized. As reflected in these habitat types, this area is a portion of a dune-slough ecosystem. These vegetation values however, would not be significantly impacted by OHV use since riding would not be in these areas.

There are three documented rare plants in the foredune area; Menzies' wallflower (*Erysimum menziesii*), beach layia (*Layia carnosa*), and pink sandverbena (*Abronia umbellata, ssp. breviflora*). Depending on the degree to which OHV riding is allowed in the foredune area, these plant species may be significantly impacted.

The USFWS made the following comment to BLM in reviewing management for the BLM parcel: "Given this situation and the critical status of the Menzies wallflower, the BLM should undertake only those actions ensuring the long term survival of the wallflower on both public and private lands on Samoa Peninsula (i.e., seek closure of the area to ORV's)."

If OHV riding was allowed, impacts would occur initially by mechanical destruction of plants, which once removed could fragment the population and prevent gene flow. This could result in significant impacts to the populations of rare plants.

Mitigation: Prepare a trails plan which avoids the maximum feasible amount of dune mat and dune hollows.

Mitigation: Provide off-site mitigation of rare plant habitat included in active riding area.

Mitigation: Fence the foredune area in order to protect populations of Menzies', beach layia, and pink sandverbena, ensuring adequate buffer as well as corridors to adjacent areas are maintained for gene flow. Provide both on-site and off-site restoration of these habitats. Align open riding areas to avoid such habitats. Utilize original 1"=200' color stereo pair photos and additional on-site surveys to prepare the plan.

Mitigation: Conduct annual monitoring plan for rare plant species to determine the relative viability of the population in any given year.

E. Wildlife

This alternative would result in significant impacts to wildlife adjacent to the proposed riding area, particularly in terms of noise.

See noise section below. The degree of impact would vary with use patterns; lower impacts during the week, higher on weekends and during events. While the intermittent nature of the disturbance could provide more opportunities for wildlife to utilize the area, such use may also prevent wildlife from becoming conditioned and actually provide more disturbance. The open sand areas are also utilized as corridors between habitat types for

wildlife species, and concentrated vehicle use could impede movement and disrupt use patterns.

Although there are no documented occurrences of white footed vole in this particular area, one was found to the north. The riparian forest surrounding Iron Creek and the woody hollows are of high value for wildlife, and likely habitat for the white footed vole, a species of special concern. The red legged frog, another species of special concern, has been documented in the vicinity, and would likely be found in ephemeral pools.

Any increase in human use, particularly use associated with camping, could increase the populations of rodents and feral animals which are known to effect wildlife.

Mitigation: Conduct site specific study to determine presence/absence of the red legged frog in dune hollows and ephemeral pools. Areas with documented occurrences would be fenced and posted, potentially on a seasonal basis.

Mitigation: Implement hours of operation between 8:00 a.m. to 5:00 p.m. and close riding areas to all OHV use at other times to allow wildlife the opportunity to move from one habitat type to another.

Mitigation: Require a special permit for any major events to ensure that impacts to wildlife are taken into consideration.

Mitigation: Conduct field monitoring studies to determine the affects OHV use is having on local wildlife populations and their use of the various habitats.

Mitigation: Restrict vehicles in the vicinity of any known nesting sites for the white footed vole.

Mitigation: Provide animal proof garbage receptacles with convenient and visible locations with regular pickup.

Open sand areas are utilized by Bembix, Microbembix, and Megachile species. If OHV use is concentrated in these areas it is likely that these invertebrate species will be subject to some impacts.

Mitigation: Fence areas where invertebrate species are nesting, removing fencing once the nesting cycle has been completed.

F. Ecosystem Function

Under this alternative, there would be significant risk of impacts to the ecological integrity of the area. This area is recognized to be a portion of a dune-slough ecosystem, which has large undisturbed areas. Continuation of existing OHV use in this location may cause fragmentation and long term damage to the various biological components, that until now have been fragmented primarily due to residentiál development to the south. This could further impede the migration of plant and animal species down the spit, as well as isolating those south of this location.

Improvements would continue to add additional human disturbances and presence to this area, but would likely be less substantial than the previous alternative. It is also contiguous with Lanphere Christensen Dunes Preserve, and OHV use would not be compatible with the elements the Nature Conservancy is seeking to preserve.

G. Cultural

This alternative would impact areas of cultural significance. In addition to areas presently exposed, OHV riding would have the potential to erode sands away, subjecting unknown sites to mechanical destruction.

Mitigation: Prior to finalizing a plan for development, conduct a site specific survey of the area to ensure that cultural values are protected.

Mitigation: Conduct monitoring as deemed necessary by an archeologist/cultural specialist to ensure that any areas designated as open to OHV use are regularly checked for potential exposure of culturally sensitive sites.

H. Noise

This alternative would cause significant off-site noise impacts to wildlife habitat. Although OHV use would be concentrated on the open dune areas, noise generated by OHV's would carry into areas that were identified as significant wildlife habitat by Karen Theiss and Associates in the wildlife report that was prepared for the County, such as the hollows, dune swamp, and coniferous forest.

Although it has been noted in some areas wildlife are known to become conditioned to high noise levels, other effects have been documented, such as vehicle noise disrupting nesting, and impairing hearing development (Theiss & Assoc. 1992). Severe stress reaction in wildlife to noise has also been documented by researchers, "The animals'

hearts showed marked weight increases, while the overall body weight declined and the adrenals, ovaries, and kidneys shrank. The study concluded that the body responds to this type of stress in such a manner as to alter significantly both the biochemistry and the anatomy" (Baldwin and Stoddard 1973).

This alternative would also potentially cause impacts on the users of the CMA pedestrian access trails and the community of Manila. Some vehicle run-up and open sand riding areas are directly adjacent to the passive use areas of the CMA. The juxtaposition of these two uses creates a high potential for annoyance.

Given that prevailing winds are generally from the northwest during the peak recreational season, OHV noise could carry to Manila if the conditions were right. However, topography is generally hilly and such dune forms would dissipate noise to a large degree that might carry from such a sight to the residential area.

Mitigation: Institute vehicle noise standards for recreational vehicles utilizing the OHV park to eliminate noisier vehicles.

Mitigation: Subject to existing law, require mufflers which are consistent with the equipment manufacturers' specifications.

Mitigation: Maintain a test station, instrumentation, and trained personnel as needed to enforce noise standards.

Mitigation: Set a 50-100 car limit on the number of vehicles able to utilize the park at any one time.

Mitigation: Ensure that adequate buffers are formed adjacent to the staging, vehicle run-up,steep uphill grades, and riding areas so that noise intrusion into other areas is minimized as much as possible.

Mitigation: Ensure that dune forms between the proposed riding area and the community of Manila are stabilized to the degree possible by fencing and use restrictions to maintain a noise buffer.

I. Social

Under this alternative, OHV use would be accommodated by providing challenging terrain with high scenic values. Passive recreationalists seeking to utilize the existing Cooperative Management Area would likely feel annoyed and may go elsewhere.

However, since waveslope driving would be provided for throughout the planning area, conflicts may still occur on the waveslope. OHV riders who have been riding at the OHV park and leave the area for the waveslope may also have difficulty in adjusting their riding style to accommodate other user groups.

The current use levels at this riding area have peaks on major holidays, with most weekdays having little or no use and typical non-holiday weekends having perhaps 5 to 15 riders. The peak use holidays have the following current estimated levels of use: President's Days - 30 campers, each with from 1 to 3 vehicles; Easter - 15 to 20; Memorial Day - 50 campers, with a peak last year of 115 vehicles for competition races. 4th of July and Labor Day are similar but slightly lower than Memorial Day use. Of the total vehicles on-site on any one occasion, perhaps 30 to 50% may be operating at one time.

Mitigation Implement vehicle free zones along the community of Manila and the Lanphere Christensen Dunes Preserve.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions; therefore since this alternative would reduce effects, impacts would be considered insignificant on large scale dune geology. In the active riding area, impacts would be reduced to small scale and manageable disturbances, provided identified mitigation is implemented. Area closures may be required to achieve this result. These results may be easier to achieve as a privately managed limited use area than as a public use area as proposed in #5.

Effects on vegetation under this alternative could be considered potentially insignificant if OHV riding was restricted to the open sand areas, and any native plants that were to colonize the periphery of the open sand areas in the future were also protected by fencing.

Other potential impacts, with appropriate mitigation and management as identified, can likely achieve a net positive result. This will require some flexibility on the part of responsible agencies to accept managing of preferred stands to reduce fragmentation and possibly some off-site mitigation.

Fragmentation of individual stands is likely to be reduced by revegetation of trail cuts. More importantly, the reduction in fragmentation of two large areas including the LP forest and Manila areas, and then the Lanphere-Christensen Preserve area and north, would provide a substantial net positive result over current conditions. However, a high

level of cooperation and management would be required in the Khaloghli riding area to reduce adverse impacts to an insignificant level.

Disturbances to wildlife in most dune areas would be substantially reduced under this alternative. An anticipated increase in vegetation cover in much of the planning area would likely increase available habitat.

In the proposed riding area, of critical importance will be the levels of use and hours of operation. Impacts at the riding area could become significantly adverse if the level of use increases dramatically.

Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed above as part of this alternative. Monitoring studies which are included in the mitigation measures, would determine the relative success of such actions and whether or not impacts are significant.

Archeological and historical sites and areas of known sensitivity under this alternative would be subject to mechanical disturbance unless identified mitigation is carried out.

Under this alternative, impacts to much of the dune system would be reduced. This alternative would act to concentrate recreational driving to two specific locations. The separation of these areas, from an ecological and land use standpoint, is somewhat intrusive and more difficult to manage than the Alternative #4 proposal.

In terms of growth inducing impacts, this alternative could further vest and substantiate OHV use within the planning area, though to a somewhat lesser degree than Alternative #5.

SOUTH SPIT ALTERNATIVES

7.57 SOUTH SPIT ALTERNATIVE #1: WAVESLOPE DRIVING ON THE WEST SIDE AND CONTROLLED ACCESS ON THE EAST SIDE (COMMITTEE PREFERRED ALTERNATIVE)

A. Overview

This alternative would allow for waveslope driving on the west side of the County road bounded to the south by Table Bluff County Park and the South Jetty to the north. This would provide approximately four miles of waveslope driving for all recreational vehicle

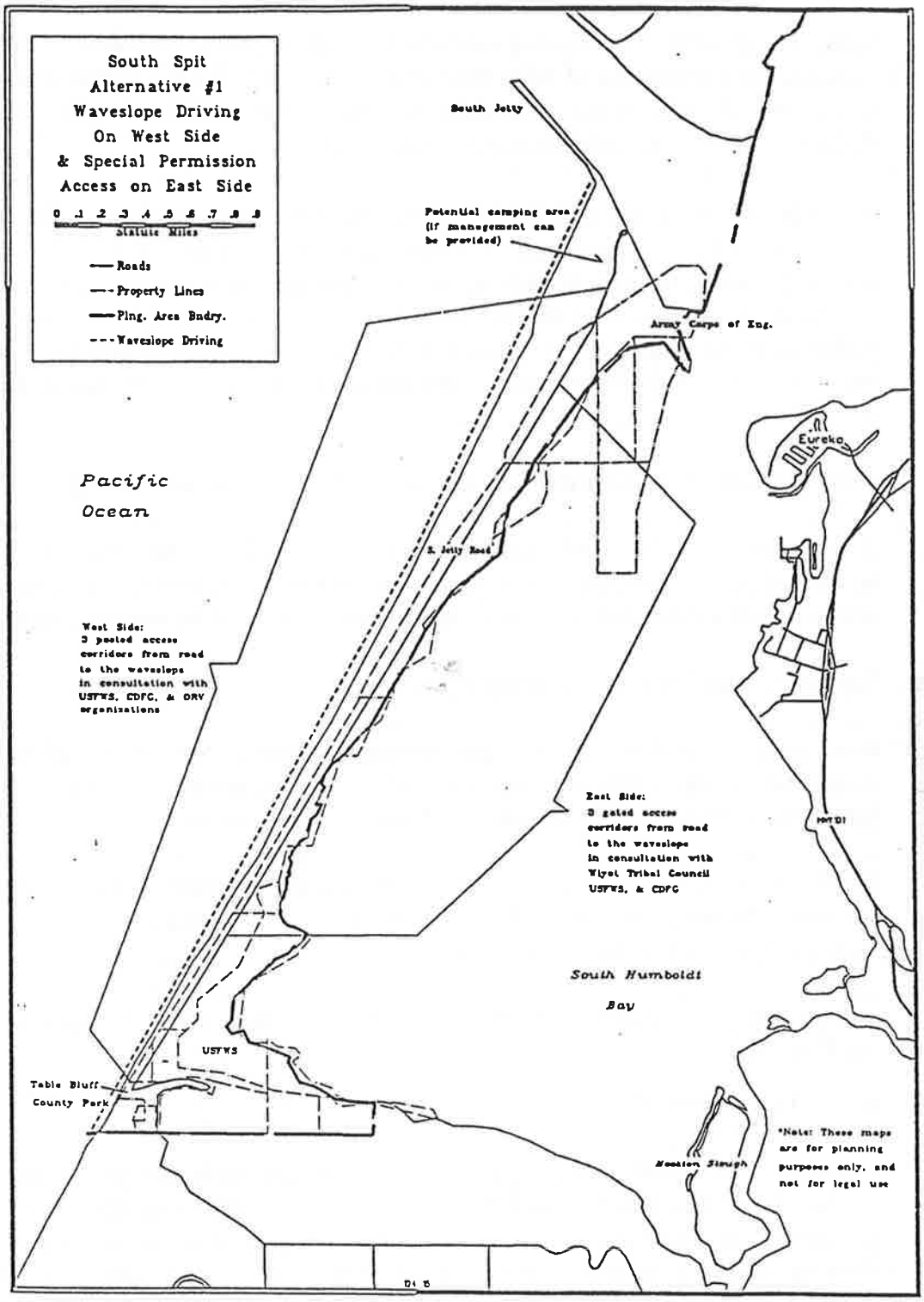


Figure 7.57, South Spit Alternative #1 map

types, consistent with the existing local coastal program policy. One designated corridor currently exists at the base of Table Bluff County Park. Additional corridors from the road through the vegetated dunes to the waveslope would be established at various intervals. A speed limit of 15 mph. would be enforced for the area.

Vehicular access on the east side of the road under this alternative would be by special permission only, where necessary for hunting, gathering, wildlife field work, or traditional uses of the Wiyot tribe. Such vehicular access would need to be managed consistent with the management objectives of both the Wiyot Tribal Council and the Humboldt Bay National Wildlife Refuge. The east side of the road would be fenced with locked gates at access corridors. Vehicle turnouts and pedestrian access could be provided at designated corridors.

Other vehicular restrictions may be warranted to effectively manage the area.

If management can be provided, camping facilities at the end of the South Spit would be developed, to be operated on a seasonal basis, managed consistent with habitat, safety, and jetty maintenance considerations. Initially, the area would be managed for day use.

Resource protection measures would include:

Rare plant protection: active dune restoration, signing and posting of rare plant populations, siting access corridors to avoid rare plants, monitoring, and enforcement. Salt marsh plants would be protected by fencing all of the east side.

Wildlife protection would be implemented through plant protection and access control measures. Snowy plover would be protected by seasonally closing and fencing nesting areas and by posting and enforcing a leash law.

Cultural resources would be protected by avoidance and monitoring. Interpretive displays would be provided.

B. Implementation

Implementation would be through a cooperative management agreement with plan of acquisition. A sign board or control station/gate would be placed at the top of the bluff posting the participating agencies and hours of use. Signing along the roadway would also likely be necessary to prevent indiscriminate vehicle use, free roaming dogs, and other issues of concern. To support the enforceability of these management provisions, a County ordinance similar to the County Park use ordinances could be adopted.

A higher level of enforcement effort would initially be required to effectively change use patterns. An estimated level of enforcement required to manage the South Spit would be one full time patrol staff. Funding of enforcement, restoration, and maintenance may be a problem. Funding through the OHV Commission for enforcement may be problematic because of the limited riding opportunities provided under this alternative. Funding could be provided by developing a recreational assessment district, which would likely require several years to implement.

C. Summary of Impacts: Effects Found to be Significant/Insignificant

Geological features would be given more protection than under present conditions; impacts would be confined to the embryonic dunes on the waveslope. Identified mitigation measures would reduce these impacts to an insignificant level.

Effects on vegetation under this alternative would be considered insignificant, provided that protection measures outlined under the alternative are implemented. In the absence of active trail cutting, vegetation is likely to increase over time, particularly by exotics. Without management, invasives would continue to displace native vegetation over the long term.

Disturbances to wildlife in the dune areas and on the bay side would be substantially reduced under this alternative. The anticipated increase in vegetation would also likely result in an increase in available habitat. Impacts associated with shorebird and snowy plover use of the beach strand would be greatly reduced by implementation of the mitigation measures discussed as part of the alternative. Monitoring studies which are included in the mitigation measures would determine the relative success of such actions and whether or not impacts are significant.

Archeological and historical sites under this alternative would no longer be subject to mechanical disturbance. Pedestrian/equestrian use and potential disturbance to archeological and cultural sites would be greatly reduced by mitigation measures; therefore no significant impacts to cultural sites are identified under this alternative.

Under this alternative, impacts to much of the dune system would be insignificant. This alternative would in a sense however, continue to disperse vehicular use on the waveslope of the entire South Spit, rather than concentrating OHV use to specific locations.

7.58 SOUTH SPIT ALTERNATIVE #2: RECREATIONAL DRIVING ON THE WEST SIDE AND LIMITED ACCESS ON THE EAST SIDE

A. Overview

This alternative proposes that recreational driving be allowed on the west side of the County Road, in the foredune area. It differs from Alternative #1 in that it allows recreational vehicle use above the waveslope in the vegetated dunes from Table Bluff County Park north to the South Jetty area, providing approximately 400 acres of riding area. The east side of the road would be closed to recreational driving except for designated corridors for hunting and clamming access. Under this alternative no special permission would be required for vehicular access to the east side.

While the tip of the South Jetty is currently designated as Public Recreation in the current LCP, this would require an amendment to the Humboldt Bay LCP to include this additional portion of the South spit foredune area into this area of Public Recreation.

B. Summary of Impacts: Effects Found to be Significant/Insignificant

For the foredune area from the South Jetty to Table Bluff erosional impacts would significantly increase if the area were designated as an off road vehicle area. This could be a potential point of concern in relation to wave overwash in narrow parts of the South Spit which could in turn impede access to the South Jetty and interfere with jetty maintenance. The increased erosional impacts could be reduced by implementation of an active trails management plan with design considerations as mentioned under the geological mitigation measures in the body of the analysis, such as insuring that trails are aligned away from prevailing winds. The level of significance of erosional impacts with active trail management depends largely on the amount of use. Currently there are indications that the amount of use that could be anticipated would not be a significant concern.

Effects on vegetation on the east side of the road under this alternative would be substantially reduced. This would have a positive effect on salt marsh species and documented occurences of Pt. Reyes Bird's Beak, Humboldt Bay Owl's Clover, and Humboldt Bay Gumplant.

Vegetation in the foredune area from the South Jetty to Table Bluff would be significantly impacted by mechanical destruction. While the area is primarily composed of European beachgrass and bush lupine, isolated pockets of native plants do occur on the foredunes west of the road. Beach layia does occur as well and individual plants would be destroyed within this riding area. Mitigation measures for this alternative would most likely need to be carried out in consultation with CDFG and USFWS.

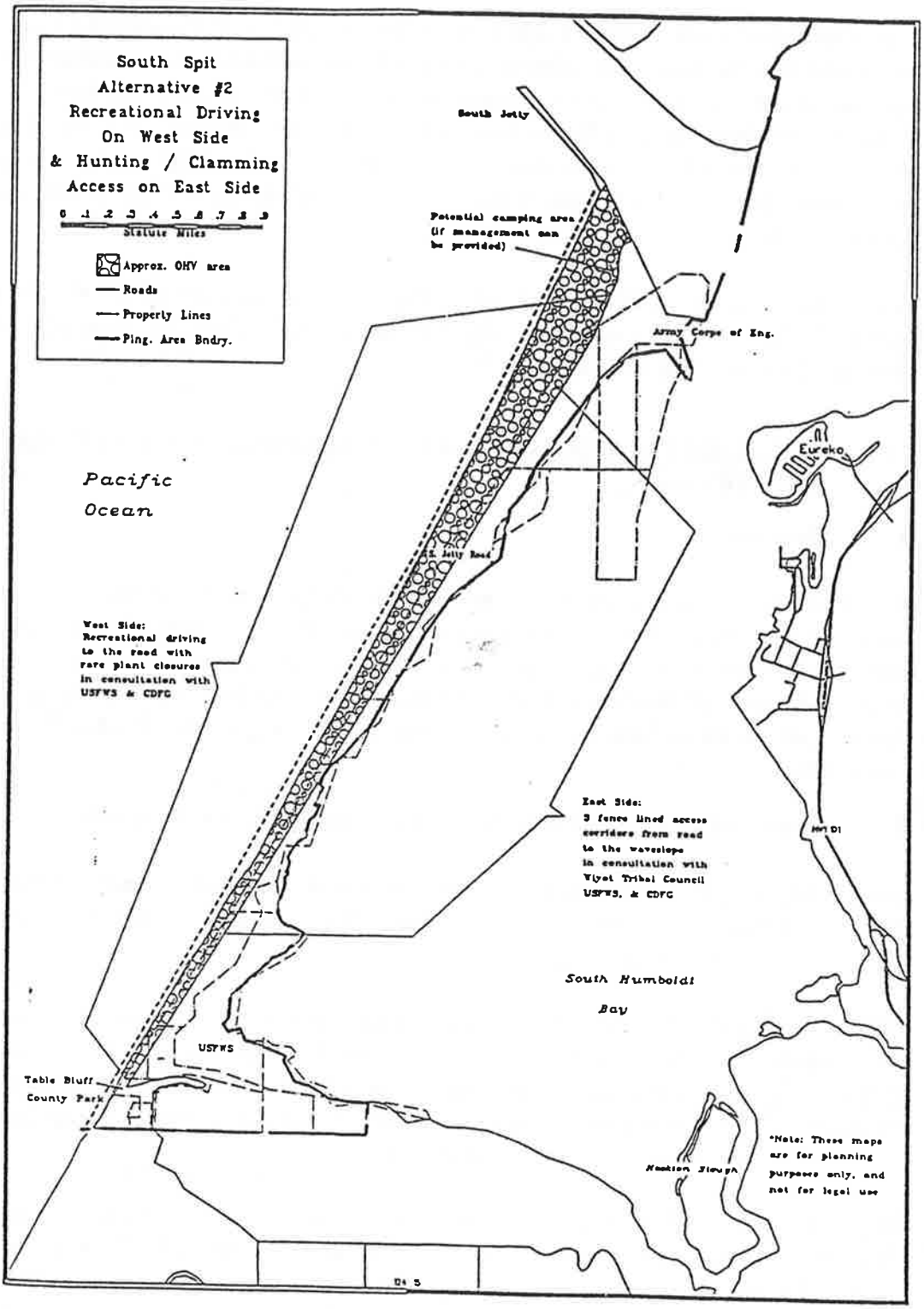


Figure 7.58, South Spit Alternative #2 map

C. Geological

Active trail cutting throughout the vegetated dunes and forest areas would continue to occur. The driftwood zone, embryonic dunes, and seaward face of the primary foredune ridge would continue to receive some impacts. Blowouts may occur on occasion. Dune ridges and sensitive dune features would continue to be destabilized.

D. Vegetation

This alternative would continue to allow disturbance to the vegetated dunes throughout the planning area. Active trail cutting would occur. In areas vegetated by exotics, there is some benefit to activities which remove the vegetation, allowing for some opportunistic native species which thrive in destabilized areas to become established; beach layia, a state listed and proposed federal listed species appears to be one such species. However, it is more likely that trail margins will become revegetated with the closest available seed source, which is usually the adjacent exotics. As a result these benefits are considered minimal at best, and by no means substantial enough to offset the effects of disturbance. Menzies' wallflower, another rare plant with similar status on the state and federal level, appears to be less adaptive, probably due to the fact that it is a monocarpic (flowering and bearing fruit only once) perennial, unlike beach layia, which is an annual. Pink sandverbena, a species proposed for federal listing, would also continue to be impacted.

E. Wildlife

This alternative would not provide wildlife any additional protection within the planning area. Since OHV use and other recreational uses would remain largely unregulated, impacts to wildlife in all affected habitats would continue to occur. Shorebirds, including the snowy plover, would continue to be impacted on the beach strand and in the driftwood zone throughout the planning area.

F. Ecosystem Function

This alternative would continue to allow OHV use throughout the the North and South Spits, dispersing the impacts rather than concentrating them in any one location. Trail cuts in the dune areas subject the dune mat community and rare plants to mechanical destruction, and through fragmentation, may also act to isolate populations. Dispersal of recreational activity is likely to be disrupting wildlife use of the beach and dunes for both foraging and breeding purpose, particularly species sensitive to disturbance like the Snowy Plover.

G. Cultural

Under this alternative impacts to both archeological and historical sites would continue to occur, particularly where sensitive cultural resource areas are subject to mechanical disturbance from vehicles, as well as disturbance by pedestrian users.

H. Noise

Noise would continue to be dispersed throughout the planlanning area. While this may serve to lessen impacts that might occur if all recreational vehicle use were concentrated in one area, it also serves to cause noise impacts on a more widespread basis.

I. Social

The North Jetty is used by a wide range of recreational use types. There have been use conflicts in the past between different user groups. Allowing all uses to continue to intermix perpetuates the likelihood of user conflicts occurring. Safety issues would continue to be a concern.

J. Summary of Impacts: Effects Found to be Significant/Insignificant

It can be assumed that any problems that currently exist on the North and South Spit would continue. On the North Spit, it could be expected that user conflicts and resource degradation would still occur at their current levels. The same issues are also present on the South Spit with the added problem of itinerant and recreational camping and the associated health and public safety issues that have been found to also occur.

7.61 ALTERNATIVES REMOVED FROM FURTHER CONSIDERATION

Several alternatives were considered by the Committee but not further analyzed in this document. The Committee voted on deleting two alternatives that were at opposite ends of policy range regarding vehicle use. An Enhancement of Natural Resources alternative for the would have prohibited all OHV use within the planning area except for emergency search and rescue, and by special permission. A Vieira and Demello OHV Riding Area alternative would have established a new OHV riding area in a relatively undisturbed area south of Mad River County Park.

While these two alternatives could be considered reasonable within the context of CEQA, the Committee eliminated them in an effort to reach a compromise decision and narrow

the range of the alternatives. Additional documentation and analysis associated with these alternatives exists in the records of the Committee and is available for public review.

The Committee also considered short term alternatives with specific courses of action for the south spit. A range of the long term aspects of these are included in the south spit alternatives presented here. The short term options were referred by the Committee to the Board of Supervisors. The Coastal Conservancy initiated an effort to develop a separate short term management plan for the south spit. The details and specific analysis associated with potential camping on the south spit would be included in that document. The Committee felt that some of the aspects associated with overnight use of the south spit were beyond the scope of this management plan.

The alternatives that are presented in this document could be recombined to form literally thousands of other alternative proposals. The Committee considered this dilemma and tried to present a reasonable set of alternatives that covered all aspects of the north and south spit management units. The individuals components, if recombined in ways that fall outside the range of combinations presented here, may required some additional analysis. In many cases, however, the effects of recombining components will be evident from reviewing the information contained in this document.

7.62 SIGNIFICANT ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED IF THE PROPOSAL IS IMPLEMENTED

Environmental effects which may remain significant even with proposed mitigation are discussed in the summary of impacts section found at the end of each alternative. The main purpose of the plan is to improve the management of the area and reduce impacts associated with existing uses; to enhance and restore degraded areas, and to provide use opportunities that are compatible with the maintenance of the integrity of the environment. Therefore, relative to existing conditions in the stated purpose of the plan, it is not likely that there will be any significant environmental effects which cannot be avoided. Some of the alternatives do raise questions as to whether identified impacts can be adequately mitigated with the mitigation identified at this point in time. In such cases, the ongoing monitoring and implementation of additional measures may be required to avoid impacts which may become significant in the long term.

7.63 THE RELATIONSHIP BETWEEN LOCAL SHORT TERM USES OF MAN'S ENVIRONMENT AND LONG TERM PRODUCTIVITY

The main goal of the plan as stated in Chapter 1 is to protect, enhance and restore the natural and cultural resources of the planning area, and to provide for human uses that are consistent with maintaining the integrity of the environment. The plan therefore should, on an overall basis, reduce the short term impacts of human uses, and improve long-term productivity. In certain instances, however, where the plan's alternative proposes intensive, active, recreational uses such as OHV use; increased localized impacts would result that could potentially impair long term productivity, without full understanding of the consequences of the action. Carrying out the proposed monitoring for identified issues of concern should provide the means of maintaining long term productivity.

The plan is not intended to irreversably commit resources to particular uses, and does not propose wholesale conversion of natural areas to a developed or urbanized status. In most cases, providing recreational and access improvements are viewed as positive steps toward providing necessary open space for the region. Nevertheless, such recreational improvements can and do have their impact, and may result in increased public use of areas over current levels.

Some alternatives of the plan propose converting areas of the beach and dunes which are currently designated Natural Resources in the LCP to a less restrictive land use designation of Public Recreation. This may result in improvements being placed on that land which would preclude other potentially beneficial uses in the future such as scientific research, and wildlife or refuge areas. The areas proposed for changes, land use designations and continued OHV use were determined with input from the CAC and/or various user groups.

7.64 GROWTH INDUCEMENT

Growth inducement is an effect that results when a project removes impediments to or encourages additional development, or simply encourages decision makers to approve proposals to change a project setting to a more developed status. Many kinds of projects can be growth inducing, including projects that provide an incentive for more intensive development, such as an Off highway vehicle recreation park in a remote, relatively undeveloped area.

Some project alternatives could contribute to growth inducement since they determine where and what type of recreational uses should be encouraged in the planning area. Some alternatives could also have growth inducing impacts through the following direct and indirect effects:

-by designating additional public recreation areas which could attract additional recreational users from out of the area, increasing the number of users.

-by contributing to the perceived lack of law enforcement and restrictions in the beaches and dunes, exacerbating existing problems with user conflicts and resource degradation.

-by providing additional OHV recreation areas which would increase the area's role as an OHV recreation center, development pressures could be increased for conversion of other Natural Resource lands to be converted as well to recreational lands.

7.65 CUMULATIVE IMPACTS

The information discussed in the environmental setting section indicates the following potential significant cumulative impacts:

The conversion of land designated NR, while perhaps an insignificant effect of this project, is part of a steady trend of reduction in the total land area dedicated to dune preservation. The loss of dune mat habitat is also part of a steady trend in the decline of populations of Menzies' wallflower and beach layia, state listed species which are proposed for federal listing.

Mitigation: See mitigation measures listed under ecosystem function for each alternative in the environmental setting.

Impacts on law enforcement and police protection services.

Impacts on natural resources and landforms in the underdeveloped portions of the planning area.

Any loss of wetland or riparian habitat area or values would have to be considered a significant cumulative effect, owing to the prior loss of such values and habitat areas in

California. Although the alternatives do not specifically call for the degradation of such habitats, both onsite and offsite effects on these habitats are a consideration.

Cumulative region wide growth in recreational uses may result in further population reductions and a decrease in nesting opportunities for the snowy plover, a species which has been identified for potential federal listing status as threatened.

Mitigation: Implement mitigation measures specified under the discussion of Alternative #1 within the environmental setting.

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1. **Color Stereo Aerial Photographs**
   A series of 1:24000 (1" = 200') stereo paired color aerial photographs of the coastal dunes from the south end of the North Spit to north of the Lanphere Christensen Dunes Preserve.

2. **Habitat Maps**
   A complementary series of 9" x 9" acetate overlays which delineate the seven different habitats within the coastal dunes. These overlays are used with the photographs in #1. Does not include forest, brackish marsh, and salt marsh.

3. **Menzies Maps**
   A complementary series of 9" x 9" acetate overlays depicting the location and density of Menzies Wallflower populations. These overlays are also to be used with the color stereo photographs.

4. **Property Survey**
   Assessor Parcel Lines drafted on ten (10) 24" x 36" mylar aerial photograph enlargements (1" = 200') of the coastal dune area and an ownership record for each parcel.

5. **Large Scale Habitat Maps**
   A coordinated series of acetate overlays showing habitat and Menzies populations to be used with above 24" x 36" mylars. These overlays depict the acreage of Menzies' habitat within each parcel.

6. **CNNDB Maps**
   Quad sheets and textual descriptions of all rare, threatened, endangered and candidate species occurrences on the coastal dunes. These were purchased from the California Natural Diversity Data Bank.

7. **Coastal Photos**
   A series of aerial photographs at a scale of 1:18000 (1" = 1500') were flown from the Eel River Mouth to the Mouth of the Mad River in order to identify potential areas of coastline dune mitigation sites.

8. **Humboldt Bay Area Photographs**
Photographs were purchased from the 1988 WAC flight by Public Works which have been used to locate and identify potential areas for a wetland mitigation bank.

9. **Oblique Aerials**
35 mm aerial photographs were taken by Public Works staff at times of extreme high and low tides, following substantial storms, and seasonally. These flights focused on the Humboldt Bay Area and the Coastal Strip and have been used to identify potential mitigation sites. The photographs were taken with a 35 mm SLR camera at altitudes of 500' to 1500'.

10. **Historic Photographs**
Historic aerial and ground photographs of the coastal spit were obtained to allow the study of dune movement, groundwater level, erosion of foredunes, and changes in vegetation.

11. **Large Scale Maps**
Screened photo mylar enlargements, 24" x 36", at 2 scales, 1"=200',1"=500', from photography dated 10-9-89. From the mouth of the Mad River to Table Bluff, encompassing the North and South Spits.

12. **1962 Historical Air Photo**
1"-500' Mylar enlargement of 1962 air photo of the Arcata beach strand.

APPENDICES

A. Land Use Designations

Urban

RL: RESIDENTIAL/LOW DENSITY

PURPOSE: to allow the development of homeowner residential uses making conservative use of urban land where adequate services are available.

PRINCIPAL USE: detached single family residences.

CONDITIONAL USES: private institutions, private recreation facilities, and neighborhood commercial.

1. New neighborhood commercial development, which is condition-ally permitted in urban residential land use designations, shall be restricted to locating along minor collectors or higher order road classification (e.g. major collectors or arterials).

2. Neighborhood commercial uses conditionally permitted in urban residential land use designations may be prohibited pursuant to rezoning procedures.

GROSS DENSITY: 3-7 units per acre.

RE: RESIDENTIAL ESTATES

PURPOSE: to allow residential development of areas within Urban Limits where community objectives, including resource protection, limit density of potential development, but where urban services are required.

PRINCIPAL USE: detached single family residences.

CONDITIONAL USES: same as RL.

GROSS DENSITY: 0-2 units per acre.

CG: COMMERCIAL GENERAL

PURPOSE: to allow the integrated development of commercial districts or neighborhood commercial centers providing for the economic well-being and convenience of the community.

PRINCIPAL USE: retail sales, retail services, office and professional uses.

CONDITIONAL USES: hotels, motels.

CR: COMMERCIAL RECREATIONAL

PURPOSE: to protect sites suitable for the development of commercial recreational facilities, and for visitor service facilities appropriate to assure recreational opportunity for visitors to the area.

PRINCIPAL USE: commercial recreational, including recreational vehicle parks, hotels and motels for example, and visitor-serving developments, including antique shops, art galleries, restaurants, taverns for example, subject to the requirements of the Humboldt Bay Area Plan, Section 3.25.

CONDITIONAL USES: single family house on existing lots, a caretaker's residence, and apartment on the upper floor of multi-story structures.

MG: INDUSTRIAL GENERAL

PURPOSE: to protect sites suitable for the development of general industrial uses.

PRINCIPAL USE: light and general manufacturing, warehousing and wholesaling, research and development.

CONDITIONAL USES: heavy manufacturing, drilling and processing of oil and gas, agricultural-general uses, heavy commercial use, sand and gravel extraction, electrical generating and distribution facilities, animal and fish reduction plants.

PC: PUBLIC FACILITY

PURPOSE: to protect sites appropriate for the development of public and private sector civic service facilities.

PRINCIPAL USE: essential services including fire and police stations, hospitals and schools; public and private facilities including office, libraries, cemeteries and clinics, but not including sites or facilities for the storage or processing of materials or equipment.

PR: PUBLIC RECREATION

PURPOSE: to protect publicly owned lands suitable for recreational development or resource protection.

PRINCIPAL USE: public recreation and open space (per HBAP, Section 3.25).

AG: AGRICULTURAL/GENERAL

PURPOSE: to protect agricultural lands with Urban Limits for continued agricultural use where such lands are economically viable, compatible with the development of Urban use and most reasonable included within Urban Limits.

PRINCIPAL USE: production of agricultural crops with a residence incidental to this use.

CONDITIONAL USES: hog production, watershed management, management for fish and wildlife habitat, recreation (exclusive of those requiring non-agricultural development), utility transmission lines, farm labor housing, and timber harvesting.

GROSS DENSITY: 2 1/2 acre minimum.

Rural

(The standards below apply outside Urban Limits as shown in the Humboldt Bay Area Plan)

RX RESIDENTIAL/EXURBAN

PURPOSE: to allow development of rural community neighborhoods not depending on urban levels of service.

PRINCIPAL USE: residential single-family with neighborhood commercial services as allowed by Section 3.28C of the Humboldt Bay Area Plan.

GROSS DENSITY: See Humboldt Bay Area Plan, Section 3.21B for a gross density for each specific geographical area.

AE AGRICULTURE EXCLUSIVE/PRIME AND NON-PRIME LANDS

PURPOSE: to protect prime and non-prime agricultural lands for long term productive agricultural use.

PRINCIPAL USE: production of food, fiber or plants, with residence as a use incidental to this activity, including two (2) separate residences where one is occupied by the owner/operator and the other by the parent or child of the owner/property, and the principal uses permitted under TC; ancillary development such as barns, storage sheds, and similar agricultural structures.

CONDITIONAL USES: hog production, watershed management, management for fish and wildlife habitat, recreation (such as hunting camps and stables except those requiring non-agricultural development), utility transmission lines, farm labor housing, greenhouses, feed lots and similar confined livestock operations.

GROSS DENSITY: 60 acre minimum parcel size, except that divisions to 20 acres may be permitted where the parcel is subject to an Agricultural Preserve contract and rezoning (see Section 3.24 of the Humboldt Bay Area Plan).

NR NATURAL RESOURCES

PURPOSE: to protect and enhance valuable fish and wildlife habitats, and provide for public and private use of their resources, including hunting, fishing and other forms of recreation.

PRINCIPAL USE: management for fish and wildlife habitat.

CONDITIONAL USES: wetland restoration, development of hunting blinds and similar minor facilities, improvement of boating facilities in estuaries consistent with Section 3.50 of the Humboldt Bay Area Plan, accessway development and improvement and removal of trees for firewood, disease control and public safety purposes. Uses as per Humboldt Bay Area Plan, Sections 3.30B 4 & 3.30B 11.

PR: PUBLIC RECREATION

PURPOSE: to protect publicly owned lands suitable for recreational development or resource protection.

PRINCIPAL USE: public recreation and open space (per HBAP, Section 3.25).

COMPATIBLE USES: caretaker dwellings, maintenance buildings.

PC: PUBLIC FACILITY

PURPOSE: to protect sites for essential public services most appropriately located in rural areas.

PRINCIPAL USE: utility substations, schools, and other essential public services most appropriately located in rural areas.

MG: INDUSTRIAL GENERAL

PURPOSE: to protect sites suitable for the development of general industrial uses.

PRINCIPAL USE: light and general manufacturing, warehousing and wholesaling, research and development.

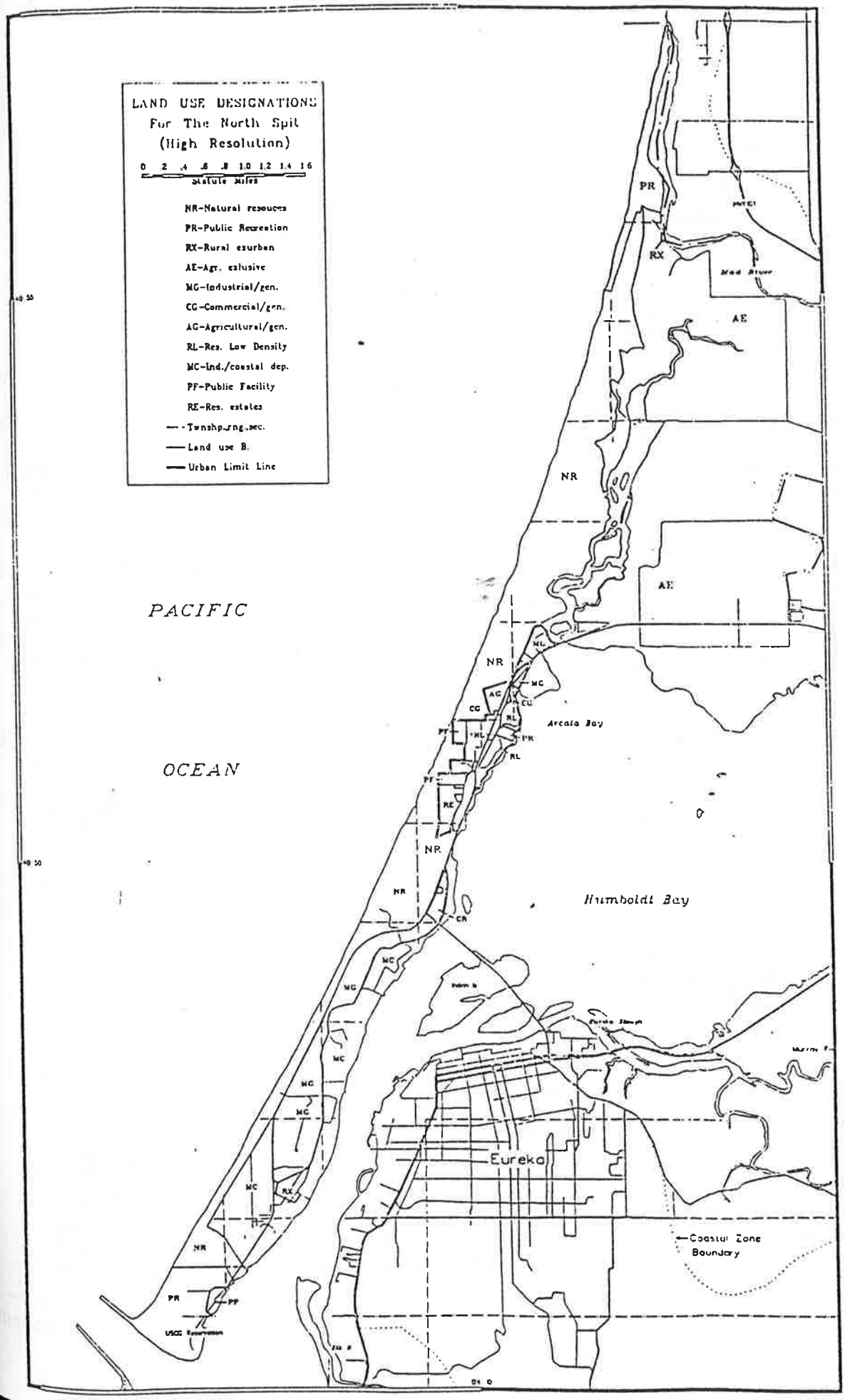
CONDITIONAL USES: heavy manufacturing, drilling and processing of oil and gas, agricultural-general uses, heavy commercial use, sand and gravel extraction, electrical generating and distribution facilities, animal and fish reduction plants.

MC INDUSTRIAL/COASTAL-DEPENDENT

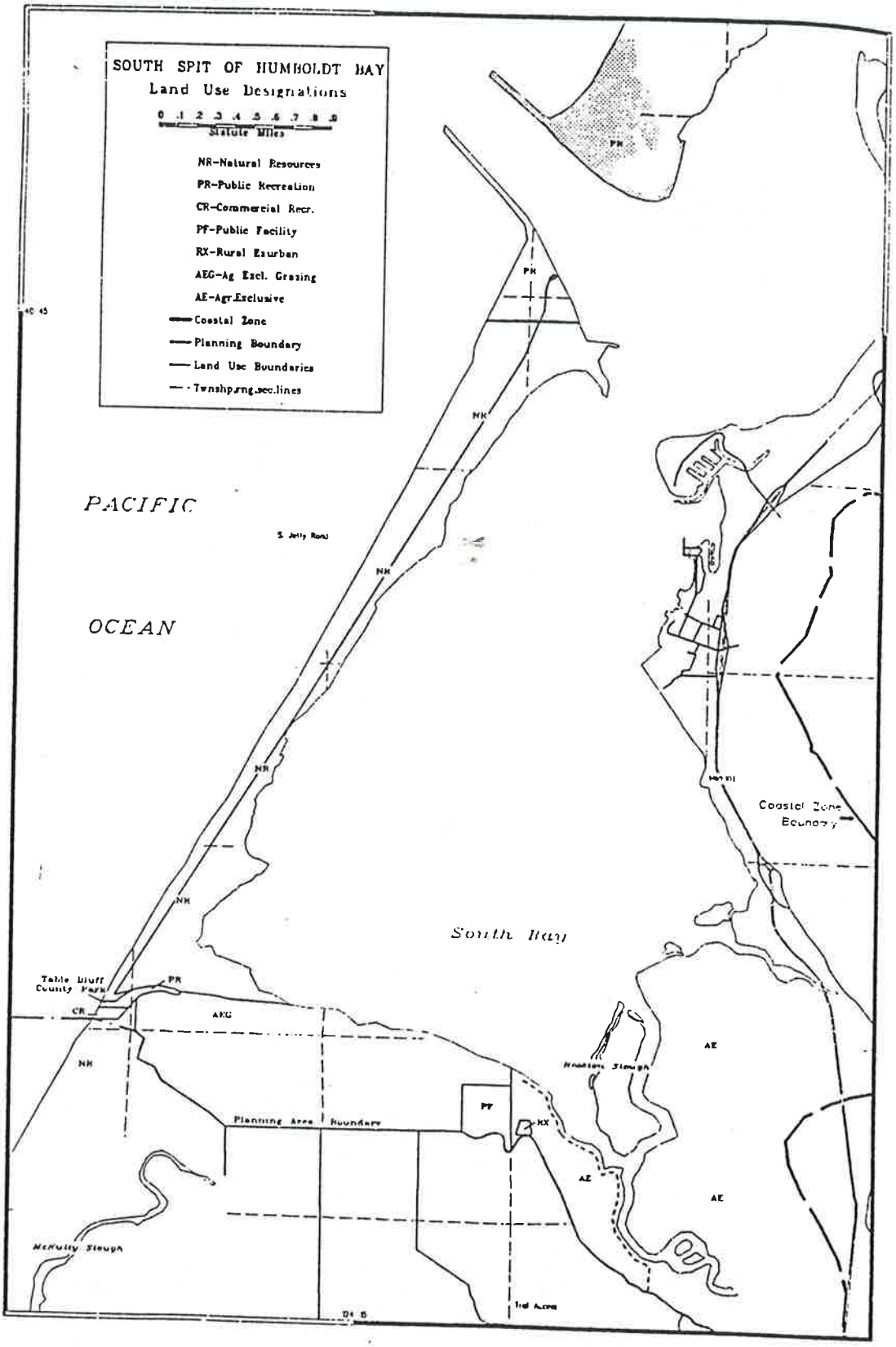
PURPOSE: to protect and reserve parcels on or near the sea for industrial uses dependent on, or related to, the harbor.

PRINCIPAL USE: any coastal-dependent industrial use that requires access to a maintained navigable channel in order to function, including, but not limited to: public docks, water-borne carrier import and export operations, ship building and boat repair, commercial fishing facilities, including berthing and fish receiving, and fish processing when product is for human consumption (fish waste processing and fish processing of products for other than human consumption are considered coastal-related uses) marine oil terminals, OCS service or supply bases, ocean intake, outfall or discharge pipelines and pipelines serving offshore facilities, aquaculture and aquaculture support facilities.

CONDITIONAL USES: visitor-serving recreational facilities that require channel access, including, but not limited to marinas serving other than solely commercial vessels, fishing piers, and boat launching facilities; coastal-related industrial uses, including, but not limited to fish waste processing and fish processing and treatment facilities, electrical generating facilities or other facilities which require an ocean intake, outfall, or pipeline. Such facilities shall not be sited on sites with channel access unless associated with a terminal. Alterations, improvements, and relocations of existing general industrial uses within the MC designation.


LAND USE DESIGNATIONS
For The North Spit
(High Resolution)
0 .2 .4 .6 .8 1.0 1.2 1.4 1.6
Statute Miles
NR-Natural resources
PR-Public Recreation
RX-Rural exurban
AE-Agr. exlusive
MG-Industrial/gen.
CG-Commercial/gen.
AG-Agricultural/gen.
RL-Res. Low Density
MC-Ind./coastal dep.
PF-Public Facility
RE-Res. estates
Twnshp.rng.sec.
Land use B.
Urban Limit Line
PACIFIC
OCEAN
Arcata Bay
Humboldt Bay
Eureka
Coastal Zone Boundary

APPENDIX A


SOUTH SPIT OF HUMBOLDT BAY
Land Use Designations
0 .1 .2 .3 .4 .5 .6 .7 .8 .9
Statute Miles
NR-Natural Resources
PR-Public Recreation
CR-Commercial Recr.
PF-Public Facility
RX-Rural Exurban
AEG-Ag Excl. Grazing
AE-Agr.Exclusive
Coastal Zone
Planning Boundary
Land Use Boundaries
Twnshp.rng.sec.lines
PACIFIC
OCEAN
South Bay
Coastal Zone Boundary
Planning Area Boundary
Table Bluff County Park
Humboldt Slough
McNulty Slough
PR
NR
CR
AEG
AE
PF
RX

APPENDIX A

ANNUAL PARTICIPATION DAYS WITHIN CALIFORNIA
BY RESIDENTS OF NORTHERN NON-METROPOLITAN COUNTIES

(IN THOUSANDS OF DAYS)

	1980	1985	1990	1995	2000
CAMPING	2,348	2,514	2,641	2,854	3,122
BOATING					
Waterskiing	755	811	845	888	958
Power Boating	344	378	403	434	475
Sailing	247	282	314	356	408
Other Boating	328	367	400	441	487
FISHING					
Lake	714	760	796	859	928
Stream	1,160	1,230	1,281	1,419	1,552
Near Shore Saltwater	287	297	308	330	349
Off Shore Saltwater	107	121	130	142	154
Other	147	155	160	170	178
HUNTING					
Big Game	79	85	88	95	104
Small Game	305	298	285	286	293
Water Fowl	118	118	120	127	141
Target Shooting	593	573	572	608	639
SWIMMING & BEACH					
Swimming					
Ocean	664	703	733	765	802
Freshwater	1,136	1,230	1,284	1,365	1,482
Pool	3,355	3,405	3,536	3,819	4,079
Underwater	36	37	38	40	42
Surfing					
Body	134	136	136	146	158
Board	84	852	74	74	70
Beach & Misc.	1,069	1,174	1,246	1,321	1,432
Sunning	439	453	460	488	524
Beach Combing	572	605	535	569	610
Beach Games	397	402	476	520	601
Misc. Swim & Beach					

PENDIX A

(Con't)

Northern Non-Metropolitan Counties

	1980	1985	1990	1995	2000
SPORTS					
Field Sports	4,366	4,171	4,396	4,898	5,252
Court Ball	1,691	1,542	1,554	1,742	1,921
Wall Ball	555	572	574	607	629
Tennis	1,663	1,743	1,831	1,961	2,068
Golf	1,160	1,245	1,335	1,488	1,677
Gym Sports	1,744	1,672	1,673	1,816	1,938
Bowling	1,409	1,491	1,563	1,688	1,801
Skating	1,439	1,339	1,392	1,548	1,634
Frisbee	939	933	931	980	1,037
Misc. Sports	1,903	1,885	1,890	2,020	2,153
WINTER SPORTS					
Downhill Skiing	334	345	580	418	480
Cross Country Skiing	12	13	14	15	17
Sledding	101	106	58	131	144
Snowmobile Riding	28	31	34	37	41
Misc. Snow Activities	131	154	169	185	199
PEDESTRIAN					
Jogging	5,999	6,427	6,693	7,080	7,495
Hiking & Climbing	2,423	2,647	2,803	3,045	3,356
RIDING					
Bicycle	5,249	5,157	5,421	6,058	6,571
Horseback	893	888	915	998	1,065
Off Road Bikes	723	655	624	672	716
Other Off Road Vehicles	269	267	257	263	277
SOCIAL					
Picnicking	2,781	2,918	2,981	3,136	3,354
Partying	4,871	5,044	5,108	5,428	5,890
Games	4,030	4,099	4,182	4,382	4,576
CRAFTS & HOBBIES	2,522	2,642	2,713	2,894	3,083
VISUAL ACTIVITIES					
Nature Appreciation	2,946	3,215	3,346	3,557	3,856
Visiting Scenic Areas	2,423	2,619	2,729	2,865	3,008
Visiting Museums/Zoos	876	911	915	963	1,025
Visiting Fairs/ Amusements	799	822	847	908	972
Visiting Historical & Cultural Places	920	979	1,012	1,071	1,139
Attending Sports Events	869	912	950	1,023	1,094

ANNUAL PER CAPITA PARTICIPATION DAYS
WITHIN CALIFORNIA BY RESIDENTS OF NORTHERN NON-METROPOLITAN COUNTIES

	1980	1985	1990	1995	2000
CAMPING	2.870	2.968	3.042	3.072	3.131
BOATING					
Waterskiing	0.923	0.957	0.973	0.956	0.961
Power Boating	0.421	0.446	0.464	0.467	0.477
Sailing	0.302	0.333	0.362	0.383	0.410
Other Boating	0.401	0.433	0.461	0.474	0.582
FISHING					
Lake	0.873	0.897	0.917	0.925	0.931
Stream	1.418	1.452	1.475	1.527	1.556
Near Shore Saltwater	0.351	0.351	0.355	0.355	0.350
Off Shore Saltwater	0.131	0.143	0.150	0.153	0.155
Other	0.180	0.183	0.184	0.182	0.179
HUNTING					
Big Game	0.097	0.100	0.102	0.103	0.104
Small Game	0.373	0.352	0.328	0.308	0.294
Water Fowl	0.145	0.139	0.139	0.137	0.142
Target Shooting	0.724	0.676	0.659	0.654	0.641
SWIMMING & BEACH					
Swimming					
Ocean	0.811	0.830	0.844	0.823	0.804
Freshwater	1.388	1.452	1.480	1.470	1.486
Pool	4.101	4.020	4.074	4.111	4.092
Underwater	0.044	0.044	0.043	0.043	0.042
Surfing					
Body	0.163	0.161	0.157	0.157	0.159
Board	0.102	1.006	0.085	0.079	0.071
Beach & Misc.					
Sunning	1.307	1.386	1.435	1.430	1.436
Beach Combing	0.537	0.535	0.529	0.526	0.526
Beach Games	0.699	0.714	0.616	0.612	0.612
Misc. Swim & Beach	0.486	0.475	0.548	0.559	0.602

Northern Non-Metropolitan Counties

	1980	1985	1990	1995	2000
SPORTS					
Field Sports	5.338	4.924	5.065	5.272	5.267
Court Ball	2.068	1.821	1.790	1.875	1.926
Wall Ball	0.679	0.675	0.661	0.653	0.631
Tennis	2.033	2.058	2.109	2.111	2.074
Golf	1.418	1.470	1.538	1.602	1.682
Gym Sports	2.132	1.974	1.928	1.955	1.944
Bowling	1.723	1.760	1.800	1.817	1.806
Skating	1.760	1.581	1.604	1.664	1.639
Frisbee	1.148	1.102	1.073	1.055	1.040
Misc. Sports	2.326	2.226	2.178	2.174	2.160
WINTER SPORTS					
Downhill Skiing	0.408	0.407	0.668	0.450	0.481
Cross Country Skiing	0.014	0.015	0.016	0.107	0.017
Sledding	0.123	0.125	0.065	0.141	0.144
Snowmobile Riding	0.035	0.037	0.039	0.040	0.041
Misc. Snow Activities	0.160	0.182	0.195	0.199	0.200
PEDESTRIAN					
Jogging	7.333	7.588	7.711	7.622	7.517
Hiking & Climbing	2.962	3.125	3.229	3.278	3.366
RIDING					
Bicycle	6.476	6.089	6.245	6.521	6.591
Horseback	1.092	1.048	1.054	1.075	1.068
Off Road Bikes	0.844	0.773	0.718	0.724	0.718
Other Off Road Vehicles	0.329	0.315	0.297	0.283	0.278
SOCIAL					
Picnicking	3.399	3.445	3.435	3.375	3.364
Partying	5.955	5.955	5.885	5.843	5.908
Games	4.927	4.839	4.818	4.717	4.589
CRAFTS & HOBBIES	3.083	3.119	3.125	3.115	3.092
VISUAL ACTIVITIES					
Nature Appreciation	3.602	3.796	3.855	3.828	3.868
Visiting Scenic Areas	2.962	3.092	3.144	3.083	3.017
Visiting Museums/Zoos	1.071	1.076	1.054	1.037	1.028
Visiting Fairs/ Amusements	0.977	0.970	0.975	0.977	0.975
Visiting Historical & Cultural Places	1.125	1.156	1.166	1.153	1.143
Attending Sports Events	1.063	1.077	1.094	1.101	1.091

Beach and Dunes Advisory Committee
PUBLIC OPINION SURVEY OF HUMBOLDT COUNTY RESIDENTS
October 14-24, 1991

by

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Arcata, CA 95521
(707) 826-4775

Students from Humboldt State University who participated in this survey project include: Tom Angel, John Barash, Elizabeth Bauman, John Catechi, Liz Christman, Len DeGroot, Tim Epperson, Chantal Fairon, Kelly Gibford, Stephanie Gomes, James Green, Traci Griggs, Susan Hass, John Hatcher, Mel Hawes, Jeannie Jensen, John Kiffmeyer, Gary Langston, Shantrin Lininger, David Link, Jason Love, Lee McCormack, Brian Miller, John Moore, Kellie Moran, Brian Pado, Heather Parton, Dirk Rabdau, Brad Reynolds, Debra Reynolds, Patrice Reynolds, Corey Salzman, Kevin Savetz, Cheryl Stalter, Paula Swenson, Todd Turner, Kevin West, Jeff Whipple and Kevin Wiese.

Nov. 19, 1991

INTRODUCTION:

This report summarizes the results of a public-opinion survey of Humboldt County adult residents regarding their use of selected ocean beach and dune areas and their attitudes about the management of several recreational opportunities in those same beach and dune areas.

The public-opinion survey was sponsored by the Beach and Dunes Citizens Advisory Committee and the Humboldt County Planning Department. This advisory committee, appointed by the Humboldt County Board of Supervisors, is working with the county Planning Department to develop a Beach and Dunes Management Plan for coastal areas ranging from Table Blu to Mad River County Park.

The goal of the public-opinion survey was to provide additional feedback regarding beach and dune issues to the Beach and Dunes Citizens Advisory Committee from a representative (random) sample of county residents 18-years-old or older.

METHOD:

The Beach and Dunes Citizens Advisory Committee requested Prof. Mar Larson, Journalism Department, Humboldt State University, to conduct the public-opinion survey. His students in an empirical research class, who were trained in survey methods, conducted the telephone survey of Humbold County residents Monday through Thursday evenings (5:30 p.m. to 9:00 p.m on Oct. 14-17 and 21-24.

A draft of the questionnaire was developed by a subcommittee of the Beach and Dunes Citizens Advisory Committee and Prof. Larson in the spri of 1991, reviewed by the full advisory committee in May, 1991, and then reviewed again by the subcommittee in the summer of 1991. The questionnaire was then adapted for use in a telephone interview and pre-tested by Prof. Larson's students in the research class in early October 1991 (the final changes were cleared with Greg Templeton, subcommittee member, prior to the start of the survey).

The random sample, as requested by the advisory committee, consists of 539 adult county residents, with slight oversampling of the major population centers along the coast (Arcata, Eureka, Fortuna). These persons were contacted at home via telephone, using both the Humboldt County telephone directory and a random-digit dialing technique designed to contact unlisted numbers. This method resulted in a refusal rate of 40.6 percent (30-40 percent has been typical of recent county-wide telephone surveys conducted by Prof. Larson). This refusal rate was no doubt affected negatively by the concurrent World Series baseball games

The error margin for a random sample of 539 is a plus-or-minus 4.5 percent (confidence level of 95 percent).

A copy of the survey questionnaire is attached.

FINDINGS:

In the county-wide random sample of 539 persons, we found 41.0 percent men (N = 221) and 59 percent women (318). In 1990, county-wide census data showed an even split (50/50 percent) between men and women sc we are forced to assume that this random survey of county residents probably has underrepresented men in its sample (this tendency has appeared in past telephone surveys in Humboldt County). The effect of this on the results cannot be determined.

In our sample of 539 county residents, we found 83.3 percent (450) had used a beach and dune area between Table Bluff and Mad River County Park in the last five years. We found 70.7 percent (381) had visited these beach and dune areas in the last year. Of these 450 "beach-goers," 45.1 percent were men and 54.9 percent were women. Of the "non-beach-goers," 20.4 percent were men and 79.6 percent were women.

The average age of the 539 adults (18-or-older) in our random sample was 42.7 years (the median age was 40), with 15 percent of the sample between 18-24 (approximately matching county census data); 45 percent between 25-44 (matching county census data); and, 13 percent 45-54 (matching county census data). Significantly, "beach-goers" were much younger on the average (39.8-years-old) than "non-beach-goers" (57.8-year old). In a matter related to age, "beach-goers" had lived in Humboldt County an average of 20.9 years, while "non-beach-goers" had lived an average of 32.1 years in Humboldt County. The average for years lived in Humboldt County for the entire sample was 22.7 years (median = 19 years). About one-fourth of the entire sample (25 percent) had lived in the count for five years or less, while 50 percent had lived in the county for 19 years or less. About 20 percent of the "beach-goers" had lived in the county for five years or less.

Age also appears to be a significant explanation of why persons in our sample said they have not made use of these beach and dune areas in the last five years (see Table 1).

Table 1. Reasons Cited For Not Making Use of Beach and Dune Areas By Non-Beach-Goers (N = 89).

	Percent	Frequency
Too old/illness	28.1	(25)
Prefer other beach areas	11.2	(10)
Too busy	11.2	(10)
Recreate elsewhere	10.1	(9)
Distance problem	9.0	(8)
Access problem (due to age/infirmity)	7.9	(7)
Don't use beach	6.7	(6)
Recent arrival in county	3.4	(3)
Disturbed by OHV use	2.2	(2)
Don't Know	2.2	(2)
No response	7.9	(7)
Total		(89)

Beach-goers were asked to identify what recreational activities t participate in on beach and dune areas between Table Bluff and Mad Riv Beach (see Table 2).

Table 2. Recreational Activities In Which Beach-Goers (N = 450) Participate.

	YES	NO
Camping	20.2% (91)	79.8% (359)
Solitude	65.3% (294)	34.7% (156)
Beachcombing/hiking	81.1% (365)	18.9% (85)
Jogging or sports	33.8% (152)	66.2% (298)
Fishing	33.8% (152)	66.2% (298)
Birdwatching/nature trail walks	44.4% (200)	55.6% (250)
Recreational ORV use	19.6% (88)	80.4% (362)
Horseback riding	7.6% (34)	92.4% (416)
Surfing	6.0% (27)	94.0% (423)
Picnicing	65.1% (293)	34.9% (157)

(CONTINUED)

Table 2 (Continued). Recreational Activities In Which Beach-Goers Participate.

	YES
Other:	
Participate in miscellaneous activities, including: archery, agate hunting, tidepooling, climbing, walking dog, target shooting, and gun club.	10.9% (49)
Take family/children to beach	1.8% (8)
Relaxing	0.9% (4)
Swimming	0.9% (4)
To watch activities	0.7% (3)
Hunting	0.7% (3)
Bicycling	0.4% (2)
Canoeing/boating	0.4% (2)
Native American cultural activities	0.4% (2)

Respondents were next asked, "in terms of how recreational opportunities in beach and dune locations from Table Bluff to Mad River Beach are currently managed, would you like to see more or less of the following activities...." The responses to this question for several activities are listed in Table 3 for the entire sample and for "beach-goers" and "non-beach-goers."

Table 3. Attitudes Toward Managed Activities In Beach and Dune Area.

DESIGNATED TENT CAMPING:

	ALL	BEACH-GOERS	NON-BEACH-GOERS
More	30.4%	31.4%	28.0%
Keep as is	28.8%	30.5%	21.9%
Less	17.1%	17.1%	18.3%
Don't know	22.3%	20.9%	31.7%

DESIGNATED R.V. CAMPING:

	ALL	BEACH-GOERS	NON-BEACH-GOERS
More	19.5%	18.0%	29.3%
Keep as is	29.9%	31.3%	24.4%
Less	31.4%	34.9%	14.6%
Don't know	18.0%	15.8%	31.7%

(CONTINUED)

Table 3 (Continued). Attitudes Toward Managed Activities In Beach Dune Areas.

DESIGNATED PEDESTRIAN ACCESS AND WALKING TRAILS:

	ALL	BEACH-GOERS	NON-BEACH-GOERS
More	59.7%	61.7%	54.9%
Keep as is	27.8%	30.1%	18.3%
Less	3.5%	3.6%	3.7%
Don't know	7.4%	4.7%	23.2%

DESIGNATED HORSEBACK TRAILS:

	ALL	BEACH-GOERS	NON-BEACH-GOERS
More	32.1%	33.3%	30.5%
Keep as is	29.1%	30.9%	23.2%
Less	12.8%	12.5%	15.8%
Don't know	24.1%	23.5%	30.5%

VEHICULAR ACCESS TO THE BEACH WAVE SLOPE:

	ALL	BEACH-GOERS	NON-BEACH-GOERS
More	15.4%	15.7%	15.8%
Keep as is	22.3%	23.5%	18.3%
Less	53.1%	56.0%	42.7%
Don't know	7.6%	4.9%	23.2%

AREAS DESIGNATED FOR OFF-ROAD MOTOR VEHICLE USE:

	ALL	BEACH-GOERS	NON-BEACH-GOERS
More	22.3%	23.7%	17.1%
Keep as is	21.9%	22.3%	21.9%
Less	45.8%	48.4%	36.6%
Don't know	8.3%	5.6%	24.4%

OTHER:

"No/less OHV on beach..."	2.4%	(13)
"Less litter..."	2.0%	(11)
"Build boardwalk/better trails"	1.3%	(7)
"More parking/other facilities"	1.3%	(7)
"More OHV areas..."	0.6%	(3)
"Need better information..."	0.6%	(3)
"Fewer people/too crowded"	0.4%	(2)
"More boating access..."	0.4%	(2)
"Add more patrols/better safety..."	0.4%	(2)

With one mention each: "More RV camping/Depends on the area/Keep cops out of OHV area/Fewer pollution sources/Shouldn't have to pay/Fewer dogs/Less illegal camping/More Native American cultural activities...."

We also asked "beach-goers" (who had been to the beach and dune area in question in the last year) to estimate the number of visits. Those findings are displayed in Table 4.

Table 4. Number Of Visits To The Beach and Dune Area By Beach-Goers In The Last Year.

Number of Visits	Frequency	Percent
1	25	4.6
2	39	7.2
3	27	5.0
4	30	5.6
5	18	3.3
6	26	4.8
7	9	1.7
8	10	1.9
9	5	0.9
10	20	3.7
11	2	0.4
12	24	4.5
13	3	0.6
14	5	0.9
15	13	2.4
16	1	0.2
17	1	0.2
18	4	0.7
20	23	4.3
24	5	0.9
25	17	3.2
26	1	0.2
27	2	0.4
28	1	0.2
30	12	2.2
35	1	0.2
36	2	0.4
40	4	0.7
45	1	0.2
48	1	0.2
50	9	1.7
52	4	0.7
60	1	0.2
65	1	0.2
75	1	0.2
80	1	0.2

Not visited in last year = 180

We then asked "beach-goers" (who had visited in the last five years but not in the past year) to estimate the number of their visits to the beach and dune area in question (see Table 5).

Table 5. Number of Visits To The Beach In The Past Five Years By Beach-Goers Who Had Not Been There In The Last Year.

Number of Visits	Frequency	Percent
1	9	1.7
2	10	1.9
3	9	1.7
4	4	0.7
5	11	2.0
6	5	0.9
9	1	0.2
10	9	1.7
12	2	0.4
13	1	0.2
15	1	0.2
20	4	0.7
24	1	0.2
50	1	0.2

"Had visited in last year" = 381
"Non-beach-goers" = 89

The following shows the percentage of respondents for each telephone prefix: 441 (0.6%); 442 (16.5%); 443 (10.6%); 444 (2.8%); 445 (5.8%); 62 (1.1%); 629 (3.2%); 668 (0.9%); 677 (2.4%); 722 (0.6%); 725 (5.0%); 733 (0.2%); 764 (0.4%); 768 (0.9%); 786 (2.8%); 822 (18.2%); 826 (11.1%); 83 (11.3%); 923 (2.8%); 926 (1.5%); 943 (0.2%); 946 (0.2%); and, 986 (1.1%).

Anyone who wishes a copy of this report or has questions about the survey, please contact Prof. Mark Larson.

your initials: _ Phone # called: _____

Beach and Dunes Advisory Committee Questionnaire

(Make sure you're speaking with an adult (18-years-old) resident of Humboldt County -- person in household over 18 with last birthday.)

Hello, this is _____ from the Humboldt County Beach and Dunes Advisory Committee. We're surveying county residents about future uses of the beach and dune areas in the county. The survey will only take a few minutes -- would you be willing to answer a few questions? ((Assure confidentiality and anonymity and that this survey is sponsored by the County Planning Department and a public-planning committee made up of variety of county citizen-group representatives.))

1. Our first question is about your recreational use of areas on the coast ranging from Table Bluff to the south of Humboldt Bay to Mad River Beach to the north, including public and private beaches, dunes, marshes and coastal forest. Have you used any of these beach and dune areas in the last year:

YES ____ (if YES, go to Question #1.A.)
NO ____ (if NO, go to Q #2)

1.A. About how many visits did you take to these beach and dune areas in the last year? _____

(GO to Q. 4

2. (For respondents who said NO to Q #1)
Have you used the beach and dune areas in the last five years:

YES ____ (if YES, go to Q #2.A.)
NO ____ (if NO, go to Q #3)

2.A. About how many visits did you take to these beach and dune areas in the last five years? _____

(GO to Q. 4)

3. (For respondents who said NO to Q #2)
Why have you not made use of the beach and dune areas?
(open-ended response)

**All respondents to Q #3 -- GO TO Q#5

4. What recreational activities do you participate in on those beach and dune areas available between Table Bluff and Mad River Beach? (check categories below/more than one response possible)

___Camping
___Solitude
___Beachcombing or hiking
___Jogging or sports
___Fishing
___Birdwatching/nature trail walks
___Recreational off-road vehicle use
___Horseback riding
___Surfing
___Picnicing
___Other: (fill in) _____

5. In terms of how recreational opportunities in beach and dune locations from Table Bluff to Mad River Beach are currently managed, would you like to see more or less of the following activities:
(circle one) (READ EACH ACTIVITY)

(circle answer)				
MORE	LESS	KEEP AS IS	DK	DESIGNATED TENT CAMPING
MORE	LESS	KEEP AS IS	DK	DESIGNATED R.V. CAMPING
MORE	LESS	KEEP AS IS	DK	DESIGNATED PEDESTRIAN ACCESS AND WALKING TRAILS
MORE	LESS	KEEP AS IS	DK	DESIGNATED HORSEBACK TRAILS
MORE	LESS	KEEP AS IS	DK	VEHICULAR ACCESS TO THE BEACH WAVE SLOPE(hardpacked area..)
MORE	LESS	KEEP AS IS	DK	AREAS DESIGNATED FOR OFF-ROAD MOTOR VEHICLE USE

OTHER? _____

6. How long have you lived in Humboldt County? ____

7. What is your age? _____ years old.

8. Gender: Male Female (identify by ear)

10 Regions

CHANGE IN TOTAL PARTICIPATION BY TYPE OF FISHING ACTIVITY
1980 - 2000

	San Diego SMSA		Los Angeles Coastal SMSA		San Bernardino/ Riverside SMSA		Santa Barbara SMSA		Monterey/ Santa Cruz SMSA	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Lake	727	44.0%	2,002	22.5%	761	60.4%	78	48.3%	268	63.3%
Stream	56	23.6	107	10.3	70	39.8	3	60.5	492	69.6
Near Shore Salt H_2O	252	37.0	643	20.3	261	56.0	24	55.3	100	57.1
Off Shore Salt H_2O	157	59.2	528	36.1	151	74.8	20	44.4	53	71.6
Other Fishing	110	34.4	212	13.1	155	51.7	13	26.0	46	55.4
TOTAL	1,282	41.8%	3,492	21.6%	1,398	58.3%	138	27.8%	979	65.5%

	San Francisco Bay Area SMSAs		Sacramento SMSA		San Joaquin Valley SMSAs		Northern Non-Metro Counties		Southern Non-Metro Counties	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Lake	1,291	26.0%	514	54.5%	567	41.1%	214	30.0%	341	38.7%
Stream	2,374	28.3	890	55.6	717	34.7	392	33.8	477	36.7
Near Shore Salt H_2O	197	9.4	176	47.4	187	34.3	62	21.6	110	31.3
Off Shore Salt H_2O	333	41.1	113	81.3	123	60.3	47	43.9	71	54.2
Other Fishing	157	17.4	84	45.4	76	28.1	31	21.1	46	26.0
TOTAL	4,352	25.4%	1,777	54.9%	1,670	37.4%	746	30.9%	1,045	37.5%

CHANGE IN TOTAL PARTICIPATION BY TYPE OF HUNTING & TARGET SHOOTING ACTIVITY
1980 - 2000

	San Diego SMSA		Los Angeles Constal SMSA		San Bernardino/ Riverside SMSA		Santa Barbara SMSA		Monterey/ Santa Cruz SMSA	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Big Game	1	2.6%	9	5.0%	3	13.0%	1	20.0%	51	134.2%
Small Game	18	8.2	-92	-9.0	39	22.0	-3	-2.7	53	27.0
Water Fowl	-4	-23.5	-14	-18.9	-2	-14.3	0	0.0	31	35.2
Target Shooting	80	16.6	14	0.6	125	33.1	2	1.8	151	42.9
TOTAL	95	12.5%	-83	-2.3%	165	27.4%	0	0.0%	286	42.8%

	San Francisco Bay Area SMSAs		Sacramento SMSA		San Joaquin Valley SMSAs		Northern Non-Metro Counties		Southern Non-Metro Counties	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Big Game	187	32.0%	18	11.9%	75	48.7%	25	31.6%	44	44.9%
Small Game	-21	-1.1	48	12.0	60	10.3	-12	-3.9	29	7.6
Water Fowl	50	6.0	59	36.9	67	28.0	23	19.5	44	29.3
Target Shooting	164	4.7	209	28.0	232	20.6%	46	7.8	145	20.0
TOTAL	380	5.6%	334	22.9%	434	20.7%	82	7.5%	262	19.3%

APPENDIX D

(Con't)

	San Francisco Bay Area SMSAs		Sacramento SMSA		San Joaquin Valley SMSAs		Northern Non-Metro Counties		Southern Non-Metro Counties	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
SWIMMING	7,936	22.5%	3,277	49.6%	3,632	36.3%	1,214	23.4%	2,207	35.3%
Ocean	1,025	20.5%	422	46.9%	526	38.9%	138	20.8%	299	35.6%
Freshwater	2,836	31.8	914	59.5	1,159	50.1	346	30.5	674	46.9
Pool	4,060	19.2	1,926	46.6	1,935	30.8	724	21.6	1,228	31.3
Underwater	15	8.3	15	32.6	12	19.0	6	16.7	6	13.6
SURFING	-30	-2.1%	61	21.4%	68	16.1%	10	4.6%	43	16.1%
Body surfing	60	6.6	65	35.7	82	30.0	24	17.9	50	29.6
Board surfing	-90	-18.4	-4	-3.9	-14	-9.4	-14	-16.7	-7	-7.1
OTHER	4,760	26.1%	1,812	56.5%	2,037	42.6%	690	27.9%	1,185	40.0%
Sunning	2,420	30.0	874	63.2	1,030	50.6	363	34.0	600	47.9
Beach Combing	495	17.7	230	43.5	204	28.1	85	19.4	128	27.8
Beach Games	311	7.6	238	31.8	238	19.7	38	6.6	126	16.8
Misc. Swim & Beach	1,534	47.4	470	86.6	565	69.6	204	51.4	331	65.5
TOTAL	12,666	23.1%	5,150	51.0%	5,737	36.7%	1,914	24.3%	3,435	36.2%

APPENDIX D

10 Regions

CHANGE IN TOTAL PARTICIPATION BY TYPE OF PEDESTRIAN ACTIVITY

1980 - 2000

	San Diego SMSA		Los Angeles Coastal SMSA		San Bernardino/ Riverside SMSA		Santa Barbara SMSA		Monterey/ Santa Cruz SMSA	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Jogging	8,263	42.3%	25,123	24.9%	8,272	59.4%	752	23.2%	2,398	57.3%
(Backpacking) Hiking & Climbing	1,275	30.3	2,376	11.4	1,444	42.2	111	16.0	1,088	68.9
Total	9,538	40.1%	27,499	22.6%	9,716	56.0%	863	22.0%	3,486	60.5%

	San Francisco Bay Area SMSAs		Sacramento SMSA		San Joaquin Valley SMSAs		Northern Non-Metro Counties		Southern Non-Metro Counties	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Jogging	11,920	26.3%	4,332	53.0%	5,422	45.1%	1,496	24.9%	3,034	39.9%
(Backpacking) Hiking & Camping	6,405	35.4	2,169	70.2	2,568	56.7	933	38.5	1,504	53.1
Total	18,325	28.9%	6,501	57.7%	7,990	48.2%	2,429	28.8%	4,538	43.5%

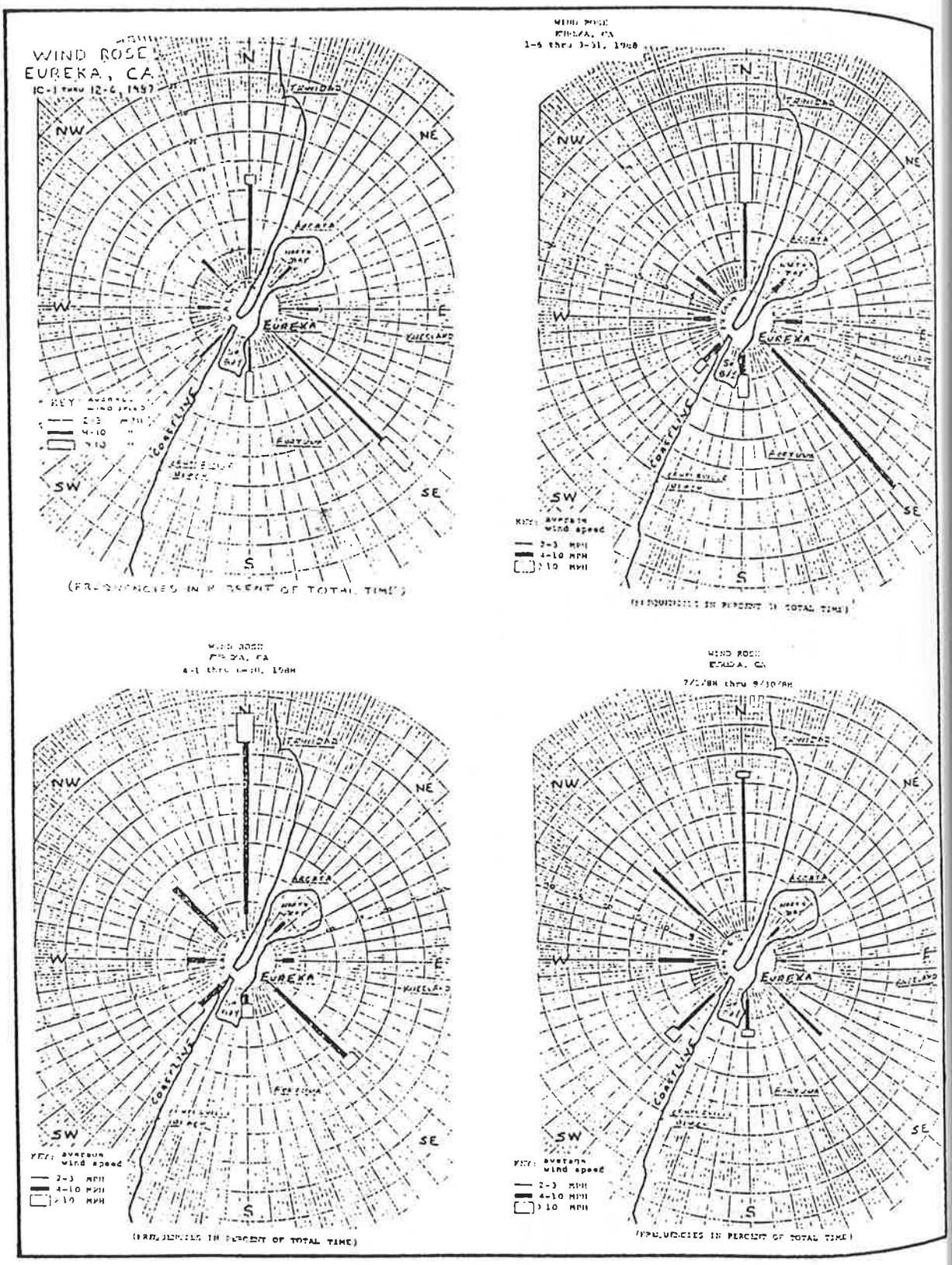
10 Regions

CHANGE IN TOTAL PARTICIPATION BY TYPE OF RIDING ACTIVITY
1980 - 2000

	San Diego SMSA		Los Angeles Coastal SMSA		San Bernardino/ Riverside SMSA		Santa Barbara SMSA		Monterey/ Santa Cruz SMSA	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Bicycling	5,471	44.5%	16,220	24.2%	5,859	56.7%	557	28.5%	3,032	127.1%
Horseback Riding	583	32.3	977	10.9	721	48.3	48	16.8	306	59.3
Off Road Bikes	371	21.2	714	8.4	433	30.6	22	8.4	190	46.8
Other Off Road Vehicles	51	9.1	-124	-5.2	83	20.8	-6	-6.6	31	20.7
TOTAL	6,476	39.5%	17,787	20.5%	7,096	52.0%	621	23.9%	3,559	103.0%

	San Francisco Bay Area SMSAs		Sacramento SMSA		San Joaquin Valley SMSAs		Northern Non-Metro Counties		Southern Non-Metro Counties	
	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent	Absolute	Percent
Bicycling	7,996	23.1%	3,582	53.5%	4,509	42.0%	1,322	25.2%	2,735	41.5%
Horseback Riding	770	14.3	491	43.6	552	31.4	172	19.3	340	30.7
Off Road Bikes	72	1.8	202	22.5	244	18.0	-7	-1.0	147	16.9
Other Off Road Vehicles	-102	-6.5	55	16.9	51	12.4	8	3.0	18	6.5
TOTAL	8,736	19.1%	4,330	47.9%	5,356	37.5%	1,495	21.0%	3,240	36.6%

APPENDIX D


WIND ROSE
EUREKA, CA
1-1 thru 12-6, 1967
N
NW
NE
W
E
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S
TRINIDAD
ARCATA
HUMBOLDT BAY
EUREKA
WOODLAND
COASTLINE
EUREKA
KEY: average wind speed
2-3 MPH
4-10 MPH
>10 MPH
(FREQUENCIES IN PERCENT OF TOTAL TIME)
WIND ROSE
EUREKA, CA
1-6 thru 3-31, 1968
(FREQUENCIES IN PERCENT OF TOTAL TIME)
WIND ROSE
EUREKA, CA
4-1 thru 6-30, 1968
(FREQUENCIES IN PERCENT OF TOTAL TIME)
WIND ROSE
EUREKA, CA
7/1/68 thru 9/30/68
(FREQUENCIES IN PERCENT OF TOTAL TIME)

APPENDIX E

PROMINENT OR COMMON FLOWERING PLANTS AND CONIFERS
OF THE SEAWARD SLOPES, BAY SHORE AND OCEAN SHORE AROUND MID-HUMBOLDT COUNTY

PLANT COMMUNITIES	PLANT NAMES	
	Scientific	Common
Coastral Strand	*Abronia latifolia*	Sand verbena
	Achillea borealis	Yarrow
	Aira caryophyllea	Hairgrass
	Ammophila arenaria	European beachgrass
	Anaphalis margaritacea	Pearly everlasting
	Arctostaphylos uva-ursi	Bearberry
	Artemisia pycnocephala	Sage
	Cakile maritima	Sea rocket
	Convolvulus soldanella	Beach morning glory
	Elymus mollis	Beach wild rye
	Erigeron glacus	Seaside daisy
	Erysimum menziesii	Wallflower
	Franseria chamissonis vars chamissonis and bipinnatisecta	Franseria
	Glehnia leiocarpa	Glehnia
	Juncus leseurii	Rush
	Lathyrus littoralis	Beach sweet pea
	Lupinus aboreus	Beach lupin
	Lupinus bicolor	Miner's lettuce
	Montia perfoliata	Plaintain
	Plantago hookeriana	Poa douglasii
	Poa douglasii	Goldenrod
	Solidago spathulata	Polygonum paronchia
	Polygonum paronchia	Tansy
	Tanacetum douglasii	
Closed-cone Pine Forest	*Calypso bylbosa**	Calypso orchid

**Calypso bulbosa*--Species has steadily declined in Humboldt County area as habitats suitable for growth are eliminated. Not common in local area, being known only from a few restricted sites (formerly not uncommon).

(continued)

PROMINENT OR COMMON FLOWERING PLANTS AND CONIFERS
OF THE SEAWARD SLOPES, BAY SHORE AND OCEAN SHORE AROUND MID-HUMBOLDT COUNTY

PLANT COMMUNITIES	PLANT NAMES	
	Scientific	Common
Closed-cone Pine Forest (cont.)		
	*Chimaphila umbellata**	Princess plume
	Gaultheria shallon	Salal
	Linnaea borealis	Twinflower
	Lonicera involucrata	Twinberry
	Myrica californica	Wax myrtle
	Picea sitchensis	Sitka spruce
	*Pinus contorte**	Beach pine
	Pseudotsuga menziesii	Douglas fir
	Vaccinium ovatum	Black huckleberry
Alluvial Bottomlands	*Alnus oregana*	Red alder
	Alopecurus geniculatus	Foxtail
	Baccharis pilularis ssp. consanguinea	Coyote brush
	Carex obnupta	Carex, sedge
	Dactylis glomerata	Orchard grass
	Glyceria sp.	Mannagrass
	Heraclewn lanatum	Cow parsnip
	Juncus sp.	Rush
	Lolium perenne	Italian ryegrass
	Rubus vitifolius	Blackberry
	Salix hookeriana	Hooker's willow
Freshwater Marsh	*Carex obnupta*	Carex, sedge
	Glyceria sp.	Mannagrass
	Juncus sp.	Rush
	Scirpus cernuus	Bulrush
	Scirpus microcarpus	Bulrush
	Typha latifolia	Cattail

Chimaphilia umbellata--Common in higher mountain areas to east--known only from a few sites in Humboldt County.

Pinus contorta--While not rare, beach pine is common only to a restricted habitat; thus if habitat becomes rare, the plant will become rare.

(continued)

PROMINENT OR COMMON FLOWERING PLANTS AND CONIFERS
OF THE SEAWARD SLOPES, BAY SHORE AND OCEAN SHORE AROUND MID-HUMBOLDT COUNTY

PLANT COMMUNITIES	PLANT NAMES	
	Scientific	Common
Redwood Forest (cont.)	*Vaccinium parvifolium*	Red huckleberry
	Viola sempervirens	Redwood violet
	Whipplea modesta	Yerba de selva
Coastal Salt Marsh	*Atriplex patula ssp. hastata*	Saltbush
	Cuscuta salina	Dodder
	Distichlis stricta	Salt grass
	Glaux maritima	Sea milkwort
	*Grindelia stricta ssp. blakei**	Humboldt Bay tarweed
	Limonium claiformicum	Statice
	*Orthocarpus castillejoides var. humboldtiensis**	Humboldt owlclover
	Salicornia virginica	Pickleweed
	Spartina foliosa	Cordgrass
	Triglochin maritima	Arrowgrass

Grindelia stricta sp. blakei--One of Humboldt County's rarest plants. Reported only from salt marshes around Humboldt Bay

Orthocarpus castillejoides----This is one of the rarest plants in the study area, being known only from the salt marshes around Humboldt Bay. An excellent example of an endemic species.

PROMINENT OR COMMON FLOWERING PLANTS AND CONIFERS
OF THE SEAWARD SLOPES, BAY SHORE AND OCEAN SHORE AROUND MID-HUMBOLDT COU

PLANT COMMUNITIES	PLANT NAMES	
	Scientific	Common
Freshwater Ponds & Lagoons	*Carex obnupta*	Carex, sedge
	Juncus spp.	Rushes
	Hippuris vulgaris	Mare's tail
	Nuphar polysepala	Yellow water lily
	Potamogeton spp.	Pondweeds
	Scirpus micocarpus	Bulrush
	Typha latifolia	Cattail
	Zannichellia palustris	Pondweed
Coastal Conifer Forest	*Abies grandis*	Grand fir
	Ceanothus thyrsiflorus	Blueblossom
	Gaultheria shallon	Salal
	Picea sitchensis	Sitka spruce
	Pseidotsuga menziesii	Douglas fir
	Rhamnus purshiana	Cascara
	Ribes snaguineum	Pink flowering currant
	Rubus parviflorus	Thimbleberry
	Rubus spectabilis	Salmonberry
	Rubus vitifolius	Blackberry
	Tauga heterophylla	Western hemlock
Upland Prairie	*Brodiaea spp.*	Brodiaea
	Calamagrostis nutkatensis	Nootka reedgrass
	Dactylis glomerata	Orchard grass
	Holcus lanatus	Velvet grass
	*Holcus mollis**	Weedy grass
	Iris douglasiana	Iris
	Nemophilia menziesii	Nemophila
	Pteridium aquilinum	Bracken fern
	Sisyrhynchium bellum	Blue-eyed grass

EIR

COMMON ANIMALS PER HABITAT

ANIMAL HABITATS	ANIMAL NAMES	
	Scientific	Common
Salt Marsh	**Mammals**	
	Reithodontomys megalotis	Western Harvest Mouse
	Peromyscus maniculatus	Deer Mouse
	Microtus californicus	California Meadow Mouse
	Mus musculus	House Mouse
	Procyon lotor	Raccoon
	Mustela frenata	Longtailed Weasel
	Amphibians and reptiles	
	None	
Freshwater Marsh	**Mammals**	
	Sorex bendirii	Marsh Shrew
	Neurotrichus gibbsii	Shrew Mole
	Castor canadensis	Beaver
	Microtus californicus	California Meadow Mouse
	Mustela vison	Mink
	Lutra canadensis	River Otter
	Amphibians and reptiles	
	Bufo Boreas	Western Toad
	Taricha granulosa	Rough Skinned Newt
	Taricha rivularis	Western Red-bellied Newt
	Ensatina eschscholtzi	Eschscholtz's Salamander
	Batrachoseps attenuatus	California Slender Salamander
	Aneides ferreus	Clouded Salamander
	Gerrhonotus coeruleus	Northern Alligator Lizard
	Charina bottae	Rubber Snake
	Thamnophis sirtalis	Common Garter Snake
	T. ordinoides	Northwestern Garter Snake
	T. elegans	Western Garter Snake

(Continued)

COMMON ANIMALS PER HABITAT

ANIMAL HABITAT	ANIMAL NAME: Scientific	Common
Coastal Strand		
	Mammals	
	Sorex vagrans	Vagrant Shrew
	Lepus californicus	Black-tailed Hare
	Sylvilagus bachmani	Brush Rabbit
	Thomomys bottae	Botta Pocket Gopher
	Reithodontomys megalotis	Western Harvest Mouse
	Peromyscus maniculatus	Deer Mouse
	Microtus californicus	California Meadow Mouse
	Zapus trinotatus	Pacific Jumping Mouse
	Mus musculus	House Mouse
	Procyon lotor	Raccoon
	Mustela frenatc	Longtailed Weasel
	Mustela erminea	Ermine
	Mephitis mephitis	Striped Skunk
	Spilogale putorius	Spotted Skunk
	Cervus canadensis	Roosevelt Elk
	Odocoileus hemionus	Blacktailed Deer
	Amphibians and reptiles	
	Hyla regilla	Pacific Tree Frog
	Rana catesbeiana	Bull Frog
	Bufo boreas	Western Toad
	Ambystoma gracile	Northwestern Salamander
	Taricha granulosa	Rough Skinned Newt
	Rhyacotriton olympicus	Olympic Salamander
	Dicamptodon ensatus	Pacific Giant Salamander
	Taricha rivularis	Western Red-bellied Newt
	Ensatina eschscholtzi	Eschscholtz's Salamander
	Plethodon elongatus	Del Norte Salamander
	Batrachoseps attenuatus	California Slender Salamander
	Aneides lugubris	Aboreal Salamander
	A. ferreus	Clouded Salamander
	A. flavipunctatus	Black Salamander
	Sceloporus occidentalis	Western Fence Lizard
Riparian Woodlands		
	Mammals	
	Castor canadensis	Beaver
	Mustela vison	Mink
	Lutra canadensis	River Otter
	Zalophus californianus	California Sea Lion
	Phoca vitulina	Harbor Seal
	Amphibians and reptiles	
	Rana boylei	Yellow-legged Frog
	Ascaphus truei	Pacific Tailed Frog
	Ambystoma gracile	Northwestern Salamander
	Taricha granulosa	Rough Skinned Newt
	Dicamptodon ensatus	Pacific Giant Salamander
	Tarioha rivularis	Western Red-bellied Newt
	Clemmys marmorata	Pacific Pondturtle

(Continued)

COMMON ANIMALS PER HABITAT

ANIMAL HABITAT	ANIMAL NAMES	
	Scientific	Common
Agricultural Land		
	Mammals	
	Sorex vagrans	Vagrant Shrew
	Scapanus orarius	Coast Mole
	Lepus californicus	Black-tailed Hare
	Sylvilagus bachmeni	Brush Rabbit
	Otospermophilus beechyi	Beechey Ground Squirrel
	Thomomys bottae	Botta Pocket Gopher
	Reithodontomys megalotis	Western Harvest Mouse
	Peromyscus maniculatus	Deer Mouse
	Microtus californicus	California Meadow Mouse
	Zapus trinotatus	Pacific Jumping Mouse
	Urocyon cinereoargenteus	Grey Fox
	Canis latrans	Coyote
	Procyon lotor	Raccoon
	Mustela frenata	Longtailed Weasel
	Mustela erminea	Ermine
	Mephitis mephitis	Striped Skunk
	Spilogale putorius	Spotted Skunk
	Odocoileus hemionus	Blacktailed Deer
	Amphibians and reptiles	
	Bufo boreas	Western Toad
	Ambystoma gracile	Northwestern Salamander
	Taricha granulosa	Rough Skinned Newt
	Rhyacotriton olympicus	Olympic Salamander
	Dicamptodon ensatus	Pacific Giant Salamander
	Taricha rivularis	Western Red-bellied Newt
	Ensatina eschscholtzi	Eschscholtz's Salamander
	Plethodon elongatus	Del Norte Salamander
	Batrachoseps attenuatus	California Slender Salamander
	Aneides lugubris	Arboreal Salamander
	A. ferreus	Clouded Salamander
	A. flavipunctatus	Black Salamander
	Thamnophis sirtalis	Common Garter Snake
	T. ordinoides	Northwestern Garter Snake
	T. elegans	Western Garter Snake

(Continued)

COMMON ANIMALS PER HABITAT

ANIMAL HABITATS	ANIMAL NAMES	
	Scientific	Common
Coniferous Forest	Amphibians and reptiles	
	Rana aurora	Red-legged Frog
	Hyla regilla	Pacific Tree Frog
	Ascaphus truei	Pacific Tailed Frog
	Bufo boreas	Western Toad
	Taricha granulosa	Rough Skinned Newt
	Taricha rivularis	Western Red-bellied Newt
	Ensatina eschscholtzi	Eschscholtz's Salamander
	Batrachoseps attenuatus	California Slender Salamander
	Aneides ferreus	Clouded Salamander
	Gerrhonotus coeruleus	Northern Alligator Lizard
	Charina bottae	Rubber Snake
	Thamnophis sirtalis	Common Garter Snake
	T. ordinoides	Northwestern Garter Snake
	T. elegans	Western Garter Snake