BIOLOGICAL ASSESSMENT FOR THE SNOWY PLOVER AT SCOTT CREEK BEACH

LOCATED IN NORTHERN SANTA CRUZ COUNTY, CALIFORNIA

Prepared by the County of Santa Cruz Parks,
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Draft

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INTRODUCTION

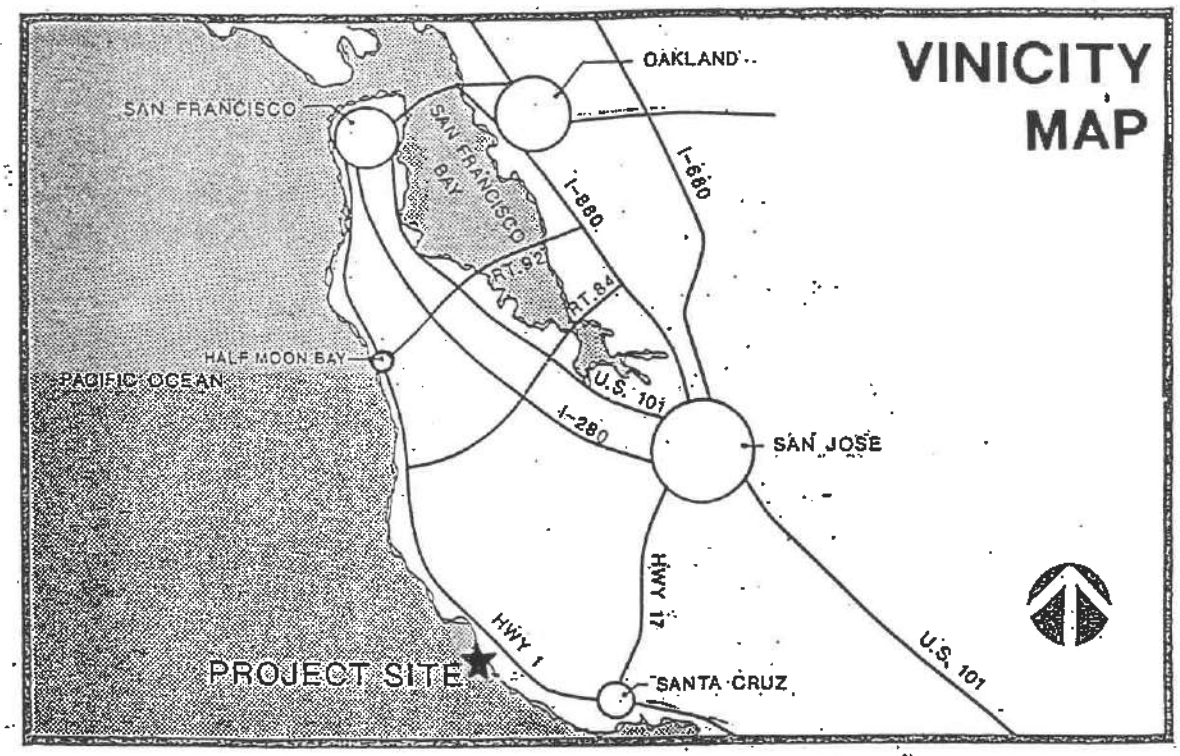
The purpose of this Biological Assessment (BA) is to obtain permission to alter 1 acre of existing snowy plover *(Charadrys alexandrinus nivosus)* breeding habitat at Scott Creek Beach.

The BA is formatted into four chapters: the first chapter discusses the existing conditions of Santa Cruz County's north coast, and more specifically Scott Creek Beach; the second chapter references the biology of the snowy plover as stated within the Federal Register; the third chapter presents the proposed improvements at Scott Creek Beach and the potential impact to snowy plover; and the fourth chapter explains the mitigation measures proposed to protect the snowy plover, the alternatives previously reviewed, and the results if no improvements are implemented.

Between the San Mateo County line to the north and the Santa Cruz City line to the south lies Santa Cruz County's north coast. There are four beaches along the north coast where snowy plover are currently known to nest: Waddell Creek State Beach, Scott Creek County Beach, Laguna Creek Beach, which is privately owned by the Coast Dairies and Land Company of Switzerland, and Wilder Beach State Preserve. Data regarding snowy plovers' activities on these four beaches has been collected over the past 3 - 8 years by the Point Reyes Bird Observatory. This data, as well as additional information, is being provided to aid in the evaluation of the Scott Creek Beach Project. Refer to the Appendix of this document for maps of the County's north coast and for the reports prepared by Point Reyes Bird Observatory on the nesting success of various north coast beaches.

With the help of the State Coastal Conservancy, the Point Reyes Bird Observatory, California State Parks, the U.S. Fish and Wildlife Service, and over 100 trained volunteers, the County of Santa Cruz has administered a program that has markedly improved the snowy plover breeding success at the two north coast beaches the County manages snowy plover protection efforts: Scott Creek Beach and Laguna Creek Beach.

This document was prepared by the County of Santa Cruz Parks, Open Space and Cultural Services Department in cooperation with the U.S. Fish and Wildlife Service. Historical data of the snowy plover activities on the aforementioned beaches was collected and provided by the Point Reyes Bird Observatory. A special "thank you" is given to Doug George, of the Point Reyes Bird Observatory, for his unwavering dedication and guidance to the preservation of the snowy plover on Santa Cruz County's north coast.



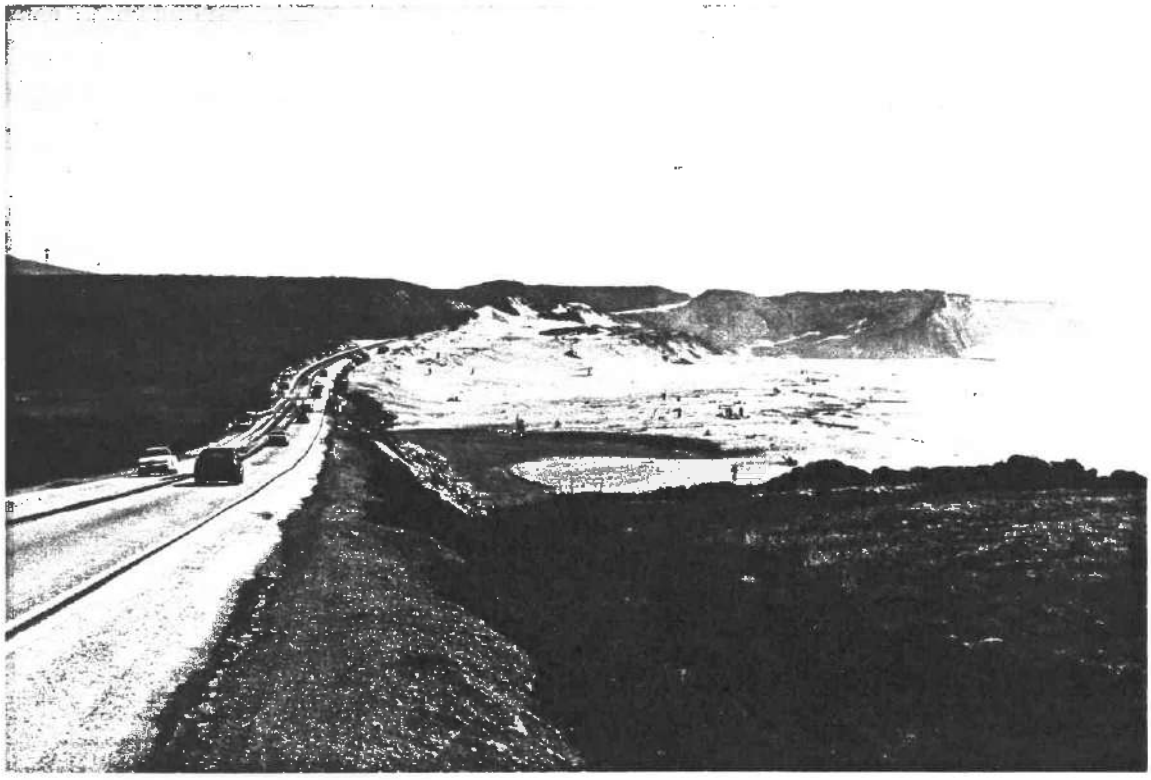


Photo: Staff
Scott Creek Beach

CHAPTER ONE - EXISTING CONDITIONS

Existing Character of Santa Cruz County's North Coast

The north coast of Santa Cruz County is rural and rugged. The coastline is typically bordered by high coastal bluffs with small coves and beaches where ephemeral and perennial creeks meet the ocean. The bluff-tops are predominately agriculture fields. Approximately nine (9) of the twenty (20) miles of coastline are in public ownership (Waddell State Beach, Greyhound Rock County Beach, Scott Creek County Beach, Wilder State Beach Preserve and Four Mile State Beach); however, the remaining eleven (11) miles of privately-owned coastline constitute the last stretch of unmanaged coastline south of San Francisco and north of Santa Cruz City. The evidence of unmanaged coastline is all too often the scars of erosion, the clutter or refuse, the invasion of weeds and noxious predators, and illegal human behavior. Refer to the north coast maps in Appendix C of this document which identify all existing and proposed public beach access points.

County General Plan Consistency

Efforts to address natural resource protection and public access at Scott Creek Beach and other beaches on the County's north coast were first outlined in the County's Local Coastal Plan (LCP) adopted by the State Coastal Commission in 1983. Due to the intense recreational use of Scott Creek Beach, the LCP identified Scott Creek Beach as a primary public beach access point. The LCP also defined sensitive habitats and limited the permissible uses/activities that can occur within or adjacent to those habitat areas. The sensitive habitat policies of the LCP are implemented by Chapter 16.32 (Sensitive Habitat Ordinance) of the County Code. The proposed Scott Creek Beach Access Enhancement Plan was developed with the objectives of restoring and protecting the natural resources identified at Scott Creek Beach and maintaining limited public access. For these reasons, the concept of the proposed plan is consistent with the intent of the LCP/General Plan.

The proposed Scott Creek Beach Access Enhancement Plan is the first phase of the "North Coast Beaches Master Plan" and the result of over a decade of planning and environmental review. In 1983, the Santa Cruz County Transportation Commission prepared a report entitled "North Coast Beaches Parking Study". This report identified Scott Creek Beach as having the highest traffic accident rate of all the north coast beach areas. The County took the findings of this traffic and parking impact study and established a public advisory group, made up of north coast constituents, who developed "The North Coast Today and Tomorrow Report". This report addressed the restoration, access enhancement, and management of several north coast beaches, including Scott Creek Beach. This report was refined by EDAW, Inc., into the "General Plan for the North Coast Beaches." The General Plan underwent extensive review by an inter-agency advisory group whose membership included State Parks, Caltrans, State Fish and Game, the Rural Bonny Doon Association, the California Coastal Commission, State Assembly Member Sam Farr's office, State Senator Henry Mello's office, the Sierra Club, Save Our Shores, and the State Coastal Conservancy. That group

endorsed the plan and recommended its implementation to the County Board of Supervisors. In 1989 the County authorized the preparation of an Environmental Impact Report (EIR) and conducted public hearings on the General Plan. Based on the findings of the EIR, the North Coast Beaches General Plan was revised to include mitigation measures suggested to reduce significant environmental impact. With regard to the Scott Creek Beach project, the EIR states that "proposed dune restoration would generally result in positive impacts and habitat improvements." The resulting "North Coast Beaches Master Plan" attempts to balance, as well as manage, often conflicting special interests including, but not limited to, public access, public safety and law enforcement, natural resource restoration and preservation, and coastal recreation.

Existing Character of Scott Creek Beach

Scott Creek Beach is unique to the north coast of Santa Cruz County because it is the only undeveloped beach immediately adjacent to Highway One. Although the beach is undeveloped, it is in public ownership. The main beach is approximately ½ mile long (approximately 10.5 acres), bounded on the north by coastal cliffs and on the south by a large sand dune. The boundaries of this beach delineate one of the most striking viewsheds along Highway One in Santa Cruz County. Thousands of people travel Highway One daily. On weekends, holidays, and during the summer, hundreds are drawn by this majestic vista to stop and visit. In addition to coastal tourists, Scott Creek Beach is a particularly popular beach for active recreation enthusiasts, such as sail-boarders, surfers, hang gliders, and drivers of off-road recreational vehicles (such off-road recreational vehicle use is illegal). Despite turbulent water and windy conditions, Scott Creek Beach is heavily used on weekends and holidays with cars parking in all available shoulder areas. As a result of this heavy public use, traffic congestion and environmental degradation have become significant issues.

Vegetation Characteristics (Draft SEIR/EA Simpson Environmental 1995)

There are seven vegetation communities present within the North Coast Beaches Master Plan Program Area which includes Scott Creek Beach (County of Santa Cruz, 1991). These vegetation communities are Coastal Scrub, Coastal Bluff Scrub, Coastal Dunes, Coastal Cliffs, Riparian, Brackish March/Lagoon (Holland, 1986) and Ruderal. Vegetation in the 5.3-acre Scott Creek Beach Project site consists of Coastal Dune and Coastal Scrub, with patches of Ruderal areas primarily adjacent to the Highway (see Figure A). The four remaining vegetation communities present within the North Coast Beaches Master Plan Area are also present in the project vicinity. For example, there is a Brackish Marsh/Lagoon just east of the project site on the other side of Highway 1. Additionally, there are patches of Coastal Bluff Scrub several hundred feet north of the project site, and Coastal Cliff habitats are located north, east, and south of the project. The Riparian vegetation community is present along the upper reaches of Scott Creek, east of the project site.

Coastal dune vegetation is characterized by patches of vegetated, stabilized sand as well as unstabilized areas lacking vegetation. A variety of low-growing perennial forbs and grasses are found within stabilized areas; within these areas, yellow sand verbena (*Abronia latifolia*), pink sand verbena

(*Ambronia umbellata*), beach bur (*Ambrosia chammissonis*), sea rocket (*Cakile maritima*), silky beach pea (*Lathyrus littoralis*), and American dune grass (*Elymus mollis*) are some of the more common plant species. Coastal Dune vegetation is found throughout most of the Scott Creek Beach project site. A list of plant species documented at Scott Creek Beach during an October 6, 1995 survey is included in Appendix E (BioSystems Analysis Inc., 1995).

Within the North Coast Beaches Master Plan Program Area, Coastal Dune vegetation is not well developed and has been the subject of both historical and recent disturbance from agricultural activities, foot traffic, off-road vehicles, and unmanaged recreational activities such as hang gliding. At Scott Creek Beach, disturbance over the past century has resulted in a primarily unstable dune which is migrating onto Highway 1. The concrete foundations of two former buildings also occupy a portion of the project site. Following the commencement of intensifying use of the project site dune area by hang gliders in the early 1990s, the dune vegetation underwent considerable incremental degradation during 1991 through 1993 (Krieberg, pers. comm.).

Although the condition of the dune vegetation at Scott Creek Beach has improved since the exclusion of commercial hang gliding concessions and implementation of snowy plover habitat management activities, this habitat remains substantially degraded. Restoration of the degraded Coastal Dune habitat is an element of the proposed project in order to prevent further migration of sand onto Highway 1.

The Coastal Scrub vegetation community is primarily characterized by dense woody shrubs and forbs. Within the North Coast Beaches Master Plan Program Area, the plant species composition within this vegetation type varies based on level of disturbance. Common shrub species include coyote brush (*Baccharis pillularis*), yellow bush lupine (*Lupinus arboreus*), poison oak (*Toxicodendron diversiloba*), blackberry (*Rubus ursinus*), lizard tail (*Gaura parviflora*), and California sage (*Artemisia californica*). Cudweed (*Gnaphalium* spp.), common aster (*Aster chilensis*), seaside yarrow (*Achillea millefolium*), and seaside paintbrush (*Castilleja latifolia*) are common herbaceous species within this habitat type. At Scott Creek Beach, a small patch of Coastal Scrub vegetation is located along the back side of the dune in the east portion of the project site.

Sensitive Plant Species (Draft Supplemental EIR, Simpson Environmental, 1995)

Surveys were conducted for nineteen special-status plant species that could potentially occur in the project site (Table 1). This species list was compiled using the list from the 1989 EIR, Nichols & Berman, and the listed and proposed species from a September 21, 1995 Species List prepared by the USFWS for this project. Additionally, the *Inventory of Rare and Endangered Vascular Plants of California* database (CNPS, 1994) and CDFG's CNDDB were searched. All CNPS (1994) Lists 1A, 1B, 2, and 3 plant species occurring in County of Santa Cruz in Coastal Dune and Coastal Scrub vegetation communities were included for consideration. Additionally, all plant species documented in Coastal Dune and Coastal Scrub habitats in the CNDDB in the USGS 7.5-minute Davenport topographic quadrangle were included.

Although the project site contains marginally suitable habitat for several of the sensitive plant species listed in Table 1, none of these species was located during botanical surveys of the project site conducted on October 6, 1995 (Appendix E). It should be noted that the botanical survey was conducted outside the flowering windows of several species in Table 1. However, based on an assessment of habitat suitability, none of these species is expected to occur in the project site.

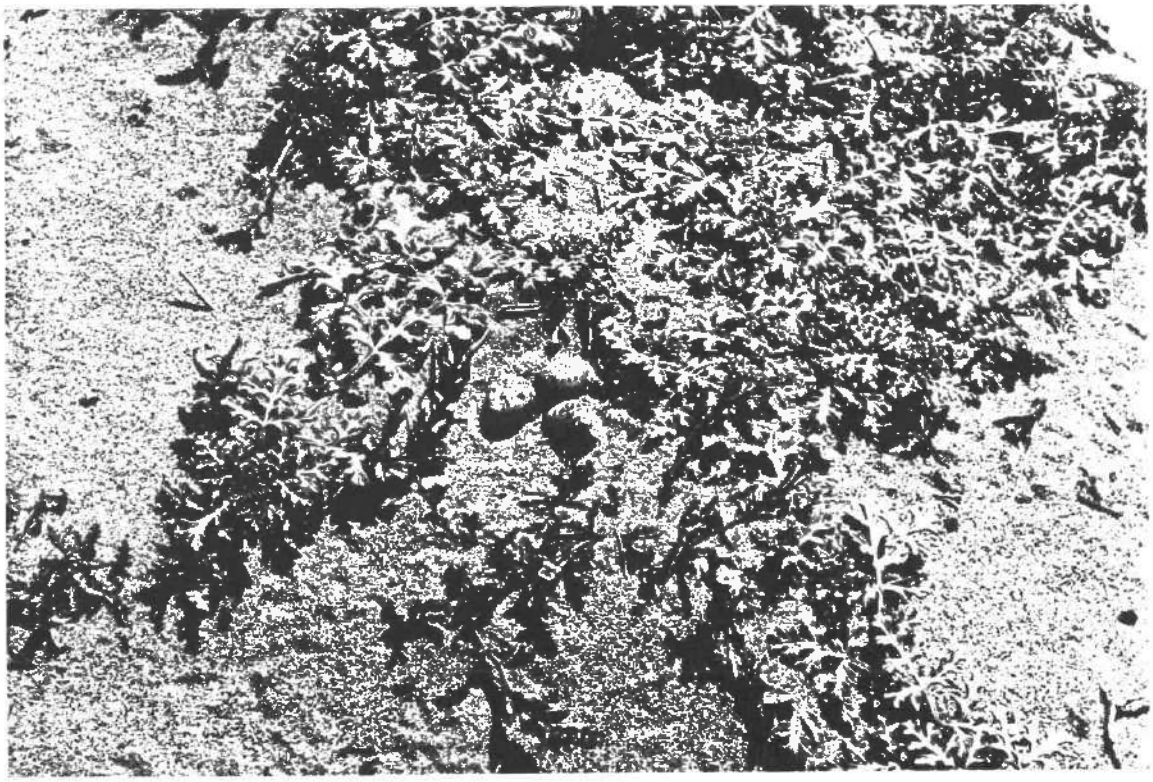


Photo: Staff
Snowy Plover Nest Among Dune Vegetation

TABLE 1

SENSITIVE PLANT SPECIES POTENTIALLY OCCURRING
IN THE SCOTT CREEK BEACH VICINITY

Scientific Name	Common Name	Status Fed[1]/State	Blooming Period	CNPS List[2]
Listed Species				
Chorizanthe pugnens var. *pungens*	Monterey spineflower	T/--	Apr.-June	1B
Chorizanthe robusta var. *robusta*	Robust spineflower	E/--	May-Sept.	1B
Pentachaeta bellidiflora	White-rayed pentachaeta	E/E	Mar.-May	1B
Candidate Species				
Agrostis blasdalei	Blasdale's bent grass	C2/--	May-July	1B
Erysimum ammophilum	Coast wallflower	C2/--	Feb.-June	1B
Erysimum franciscanum	San Francisco wallflower	C2/--	Mar.-June	4
Grindelia hirsutula var. *maritima*	San Francisco gumplant	C2/--	Aug.-Sept.	1B
Horkelia cuneata ssp. *sericea*	Kellog's horkelia	C2/--	Apr.-Sept.	1B
Horkelia marinensis	Point Reyes horkelia	C2/--	May-Sept.	1B
Perideridia gairdneri ssp. *gairdneri*	Gairdner's yampah	C2/--	June-Oct.	4
Silene verecunda ssp. *verecunda*	San Francisco campion	C2/--	Mar.-Aug.	1B
Stebbinsoseris decipiens	Santa Cruz microseris	C2/--	Apr.-May	1B
Other Species				
Arctostaphylos hookeri ssp. *hookeri*	Hooker's manzanita	--/--	Feb.-May	1B
Castilleja latifolia	Monterey indian paintbrush	--/--	Feb.-Sept.	4
Collinsia multicolor	San Francisco collinsia	--/--	Mar.-May	4
Corethrogyne leucophylla	Branching beach aster	--/--	July-Oct.	4
Micropus amphibolus	Mt. Diablo cottonweed	--/--	Apr.-May	4
Piperia michaelii	Michael's rein orchid	--/--	May-Aug.	4
Plagiobothrys chorisianus	Choris's popcornflower	--/--	Apr.June	3

[1] C2=Federal Candidate, Category 2 - includes species for which the threat and/or distribution data are insufficient to support federal listing.

[2] CNPS List 1B includes species which are rare, threatened, or endangered in California and elsewhere; List 3 includes species about which there is insufficient information to assign them to one of the other lists or reject them; List 4 includes species which are not rare, threatened, or endangered, but are of limited distribution.

Wildlife Characteristics (Draft SEIR/EA Simpson 1995)

A wide variety of wildlife species occur in the project vicinity; the high wildlife diversity is largely attributable to the diverse vegetation communities located in close proximity to each other (Edaw, General Plan, 1987). Based on habitat suitability, several hundred wildlife species have been predicted to occur in the project vicinity (County of Santa Cruz, 1987). However, the majority of the species predicted to occur in the project vicinity would not be expected to occur in the coastal Dune and Coastal Scrub Habitats located within the project site.

Bird species observed in the vicinity of Scott Creek Beach include brown pelican (*Pelicanus occidentalis*), pelagic cormorant (*Phalacrocorax pelagicus*), cinnamon teal (*Anas cyanoptera*), turkey vulture (*Cathartes aura*), snowy plover (*Charadrius alexandrinus nivosus*), killdeer (*Charadrius vociferus*), spotted sandpiper (*Actitis macularia*), least sandpiper (*Calidris minutilla*), Wilson's phalarope (*Phalaropus tricolor*), Western gull (*Larus occidentalis*), pigeon guillemot (*Cepphus columba*), black phoebe (*Saynoris nigricans*), cliff swallow (*Hirundo pyrrhonota*), barn swallow (*Hirundo rustica*), common raven (*Corvus corax*), European starling (*Sturnus vulgaris*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), song sparrow (*Melospiza melodia*), and house finch (*Carpodacus mexicanus*) (Edaw, General Plan, 1987). Several of these species were observed in the project vicinity during the August 4 wildlife survey; however, the only wildlife species observed in the project site was snowy plover.

Sensitive Wildlife species (Draft SEIR/EA Simpson 1995)

Sensitive wildlife species known or potentially occurring in the project vicinity were identified through literature review, agency consultation, and a search of CDFG's CNDDB (Table 2). This species list was compiled using the list from the 1989 EIR, Nichols & Berman, the listed and proposed species from a September 21, 1995 Species List prepared by the USFWS for this project and species documented in the CNDDB in the USGS Davenport topographic quadrangle.

With the exception of the federally threatened snowy plover, none of the species in Table 2 has been documented or is expected to occur within the project site. The extensive list reflects the habitat diversity of areas surrounding the project site. For example, the tidewater goby has been documented in Scott Creek (Edaw, General Plan, 1987). California red-legged frog (*Rana aurora draytonii*), saltmarsh common yellowthroat (*Gethlypis trichas sinuosa*), and tri-colored blackbird (*Agelaius tricolor*) have been observed in the marsh area just east of the project site (CNDDB, 1995). Peregrine falcons (*Falco peregrinus anatum*) have been documented nesting on cliffs located several miles north of the project site (Santa Cruz Bird Club, pers. comm.).

TABLE 2

SPECIAL-STATUS WILDLIFE KNOWN OR POTENTIALLY OCCURRING IN THE SCOTT CREEK BEACH VICINITY

Common Name	Scientific Name	Federal Status[3]	State Status[4]
Reptiles and Amphibians			
Southwestern pond turtle	*Clemmys marmorata pallida*	C2	CSC
California horned lizard	*Phrynosoma coronatum frontale*	--	CSC
Foothill yellow-legged frog	*Rana boylei*	C2	CSC
California red-legged frog	*Rana aurora draytonii*	PE	--
Fish			
Tidewater goby	*Eucyclobolus newberryi*	E	CSC
Steelhead trout	*Oncorhnychus mykiss*	--	SA
Coho salmon	*Oncorhnychus kisutch*	--	E
Insects			
San Francisco tree lupine moth	*Grapholita edwardsiana*	C2	SA
Birds			
Common loon	*Gavia immer*	--	CSC
Brown pelican	*Pelicanus occidentalis*	E	E
Double-crested cormorant	*Phalacrocorax aurintus*	--	CSC
Harledquin duck	*Histrionicus histrionicus*	--	CSC
Osprey	*Pandoin haliaetus*	--	CSC
Bald eagle	*Haliaectus leucocephalus*	T	E
Northern harrier	*Circus cyaneus*	--	CSC
Sharp-skinned hawk	*Accipiter striatus*	--	CSC
Cooper's hawk	*Accipiter coooperii*	--	CSC
Golden eagle	*Aquila chrysaetos*	--	CSC
Peregrine falcon	*Falco peregrinus anatum*	E	E
California clapper rail	*Rallus longirostris obsoletus*	E	E
Snowy plover	*Charadrius alexandrinus nivosus*	T	CSC
California gull	*Larus californicus*	--	CSC
Elegant tern	*Sterna elegans*	--	CSC
Marbled murrelet	*Brachyramphus marmoratus*	T	CSC

[3] E=Federally endangered; T=Federally threatened; PE=Proposed federally endangered; C=Category 2 candidate species under review for federal listing

[4] E=State of California endangered; T=State of California athreatened; CSC=State of California Species of Special Concern; FP=State of Californria fully protected species; SA=State of California special animal

TABLE 2 (cont.)

SPECIAL-STATUS WILDLIFE KNOWN OR POTENTIALLY OCCURRING IN THE SCOTT CREEK BEACH VICINITY

Common Name	Scientific Name	Federal Status[3]	State Status[4]
Birds (cont.)			
Rhinoceros auklet	*Cerorhinca monocerata*	--	CSC
Burrowing owl	*Athene cunicularia*	--	CSC
Long-eared owl	*Asio otus*	--	CSC
Short-eared owl	*Asio flammeus*	--	CSC
Black swift	*Cypseloides niger*	--	CSC
Purple martin	*Progne subis*	--	CSC
Bank swallow	*Riparia riparia*	--	E
Yellow warbler	*Dendroica petechia brewsteri*	--	CSC
Saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	--	CSC
Yellow-breasted chat	*Icteria virens*	--	CSC
Tri-colored blackbird	*Agelaius tricolor*	C2	CSC
Mammals			
Southern sea otter	*Ehhydra lutris nereis*	T	FP

[3] E=Federally endangered; T=Federally threatened; PE=Proposed federally endangered; C=Category 2 candidate species under review for federal listing

[4] E=State of California endangered; T=State of California athreatened; CSC=State of California Species of Special Concern; FP=State of Califonria fully protected species; SA=State of California special animal

Existing Recreational Activities

The predominant recreational activities at Scott Creek Beach are water and wind sports: surfing, surf fishing, sail boarding, hang gliding and kiting. Other recreational activities include beach-combing, beach picnics/parties, and exercising pet dogs. Illegal recreational activities at Scott Creek Beach include driving of off-road recreational vehicles. The following is a matrix intended to provide information regarding the extent of these activities and their existing impact to snowy plovers. This information was provided by the County's North Coast Beaches Advisory Committee, comprised of a diverse group of north coast constituents and special interest representatives.

ACTIVITY MATRIX

ACTIVITY	AVERAGE # OF INDIVIDUALS PER MONTH	MONTHS / YEAR	EX. IMPACT TO PLOVER/HABITAT
SURFING	±300	ALL YEAR	LOW
SAIL BOARDING	±300	MARCH - SEPT.	LOW
*HANG GLIDING	±80	SEPT. - MARCH	NONE DURING SEASON
*KITES	±15	MARCH - OCT.	HIGH
*SURF FISHING	±10	ALL YEAR	MODERATE
*BEACH COMBING	±600	ALL YEAR	HIGH
*PICNIC/PARTIES	±100	MARCH - NOV.	HIGH
*OFF-ROAD	±20	ALL YEAR	HIGH

* It is speculated that by limiting areas for human activities, and providing an area of refuge for plover activities, existing impacts to plover breeding habitat can be reduced.

Over the past two decades, the County of Santa Cruz has worked closely with the residents and various user groups of the north coast beaches, including Scott Creek Beach. In 1990, the County established the second North Coast Beaches Advisory Committee to advise the County Board of Supervisors on matters related to development and management of the north coast beaches. Membership on this Committee represents: the Santa Cruz Board Sailing Association, Monterey Bay Hang Gliding Association, South Bay Naturists, Save Our Shores, North Coast Residents, Rancho Del Oso Nature Center, North Coast Improvement Association, Davenport Volunteer Fire Department, North Coast Farmers, Rural Bonny Doon Association, and the Santa Cruz Surfing

Association. The County has made active efforts to communicate concerns regarding the snowy plover to these special interest groups and organizations that use the north coast area; snowy plover interpretive information has been published in newsletters of these organizations, resulting in several trained plover protection volunteers and hundreds of conscientious users. At Scott Creek Beach, a favorite site for hang gliders to learn to fly, hang gliding has been cooperatively ceased during the snowy plover breeding season, aiding a marked increase of the reproductive success at this beach. Continued use by the hang gliders of the Scott Creek Beach dune area will be considered and addressed in the supplemental EIR prepared for this project.

Property Ownership and Plover Protection Management

The potential snowy plover habitat on the north coast of Santa Cruz County measures approximately 23 acres and is located across four separate beaches. The County manages the snowy plover protection programs at two beaches (Laguna and Scott Creek), or approximately 14.5 acres of potential habitat. The remaining habitat (Waddell Creek and Wilder) is managed by the California Department of State Parks. In an effort to protect dwindling plover habitat, Wilder Beach has been designated as a state preserve with no public access. The snowy plover protection measures at Waddell State Beach are limited at this time to the posting of snowy plover interpretive information. Laguna Creek Beach is privately owned; however, the County obtained an easement agreement specifically to manage the protection of snowy plovers at this beach from 1992 - 1997. Scott Creek Beach is owned and managed by the County.

The snowy plover protection program administered by the County on the north coast, with the cooperation of the Point Reyes Bird Observatory and the State Coastal Conservancy, has been very successful. The reproductive success (chick per egg) at Laguna Creek Beach prior to instituting this program averaged 12.5% between 1988 - 1991. The average reproductive success at Laguna Creek Beach since the commencement of this program in 1992 is 41% (1992-1995). The average reproductive success at Scott Creek Beach is 30% (1993-1995). Reproductive success prior to 1992 is unknown.

The snowy plover protection program administered by the County has been in existence since 1992. In 1992, the program consisted of purchasing tools and materials, and installing triangular exclosures around nests at Laguna Creek Beach determined to be viable and vulnerable by PRBO biologists. Volunteers and County staff were trained by the California Department of Parks. It was during this first year that interpretive signs were developed and posted at several north coast beaches. During 1993, the County expanded the program to include its own volunteer training workshops using the same format as State Parks. Exclosures were modified by PRBO to include twine tops and were installed around snowy plover nests located at both Scott Creek and Laguna Creek Beaches which were determined to be viable and vulnerable by PRBO biologists. During 1994, the County expanded its snowy plover protection program to include a symbolic fence in addition to the above. The symbolic fence consisted of a post every ten to fifteen feet on center with a single strand of cable running between the posts and signs periodically attached to the posts. The symbolic fence was

installed around areas plovers nested or attempted to nest the previous season at both Scott Creek and Laguna Creek Beaches. At Scott Creek Beach, the symbolic fence encircled approximately 2/3 of an acre, or the north face of the dune area. At Laguna Creek Beach, the symbolic fence encircled approximately two acres in the center of the beach.

In recent years prior to 1992, snowy plovers were not thought to breed at Scott Creek Beach. Due to the intensive recreational use of the beach, Scott Creek Beach was not monitored for breeding activity. However, Scott Creek Beach historically supported snowy plover breeding activities. "Museum collections of snowy plover egg sets were obtained from Scott Creek Beach during the years 1878 - 1946" (verbal reference, Doug George). In 1992, two birds were reported to fledge at Scott Creek Beach. The nest locations were unknown, but at least one nesting attempt did occur in the dune area. In 1993, there were multiple nesting attempts on the face of the Scott Creek Beach dune. None were successful, including one nesting attempt that was exclosed; however, two birds fledged Scott Creek Beach from an exclosed nest on the beach in an area proposed for limited disturbance. In 1994, multiple nests were attempted on the Scott Creek Beach dune, and three birds fledged from two separate nests located in the dune area. One nest was exclosed; both nests were protected with a post and cable fence identifying the area as off-limits to the public. Vandalism occurred on one occasion when an exclosure was dismantled and its sides used as traction for a vehicle that apparently became stuck in the sand. Surprisingly, the nest hatched.

The following tables show the snowy plover reproductive success at the various beaches on Santa Cruz County's north coast. More detailed reports have been provided by the Point Reyes Bird Observatory and are attached as an appendix to this document.

Table 1. **Breeding Success of Snowy Plovers at Scott Creek Beach in 1993 and 1994**
Rows of numbers without asterisks were unprotected nests.
Rows of numbers marked with an asterisk were nests protected with exclosures.
Rows with 2 asterisks were nests protected with exclosures and unprotected nests, combined. (Douglas George, 1995)

Year	Number of Nests	Total Eggs Laid	Percent Nests hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged Per Egg
1992	3	?	?	?	?	?	?	2	?
1993	3	8	0.0	0	0.0	0	--	0	0.00
1993*	2	6	50.0	1	50.0	3	66.7	2	0.33
1993**	5	14	20.0	1	21.4	3	66.7	2	0.14
1994	2	6	50.0	1	33.3	2	50.0	1	0.17
1994*	1	3	100.0	1	66.7	2	100.0	2	0.67
1994**	3	9	66.7	2	44.4	4	75.0	3	0.33
1995	3	9	33.3	1	22.2	2	100.0	2	0.22
1995*	3	9	100.0	3	88.9	8	75.0	6	0.67
1995**	6	6	66.7	4	55.6	10	80.0	8	0.44

Table 2: **Causes of Snowy Plover Nest Loss at Scott Creek Beach in 1993 and 1994**
Rows of numbers without asterisks were unprotected nests.
Rows of numbers marked with an asterisk were nests protected with exclosures.

Year	Deserted*
1993	3
1993*	1
1994	1
1995	1

*Nests lost to desertion are nests that were abandoned by the parent birds, and the various reasons for abandonment are only assumption.

Table 3: **Breeding Success of Snowy Plovers at Laguna Creek Beach 1988-1994**
Rows of numbers marked with an asterisk were nests protected with an exclosure.
Those without an asterisk were unprotected nests.

Year	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged Per Egg
1988	5	10	20.0	1	30.0	3	100.0	3	0.30
1989	11	20	18.2	2	20.0	6	50.0	3	0.10
1990	5	15	20.0	1	13.3	2	100.0	2	0.13
1991	4	9	25.0	1	22.2	2	100.0	2	0.13
1992	3	6	0.0	0	0.0	0	--	0	0.00
1992*	5	15	80.0	4	80.0	12	83.3	10	0.67
1993	3	6	0.0	0	0.0	0	--	0	0.00
1993*	7	21	71.4	5	61.9	13	53.8	7	0.33
1994	3	4	0.0	0	0.0	0	--	0	0.00
1994*	5	15	100.0	5	80.0	12	100.0	12	0.80

Table 4: **Causes of Snowy Plover Nest Loss at Laguna Creek Beach 1988-1994**
Rows of numbers marked with an asterisk were nests protected with an exclosure. Those without an asterisk were unprotected nests.

Year	Unknown	People	Canine	Skunk	Raven	Predator	Rising Water of Lagoon	Deserted
1988	4							
1989	5	3		1				
1990	1	2	1					
1991	1				1			
1992				1			2	
1992*				1				
1993							1	2
1993*							1	1
1994	1	1				1		
1994*[1]								

[1]No protected nests were lost in 1994.

Table 5: **Breeding Success of Snowy Plovers at Waddell Beach in 1994**

Year	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged Per Egg
1994	11	32	36.4%	4	25.0%	8	25.0%	2	0.06

Table 6: **Causes of Snowy Plover Nest Loss at Waddell Beach in 1994**

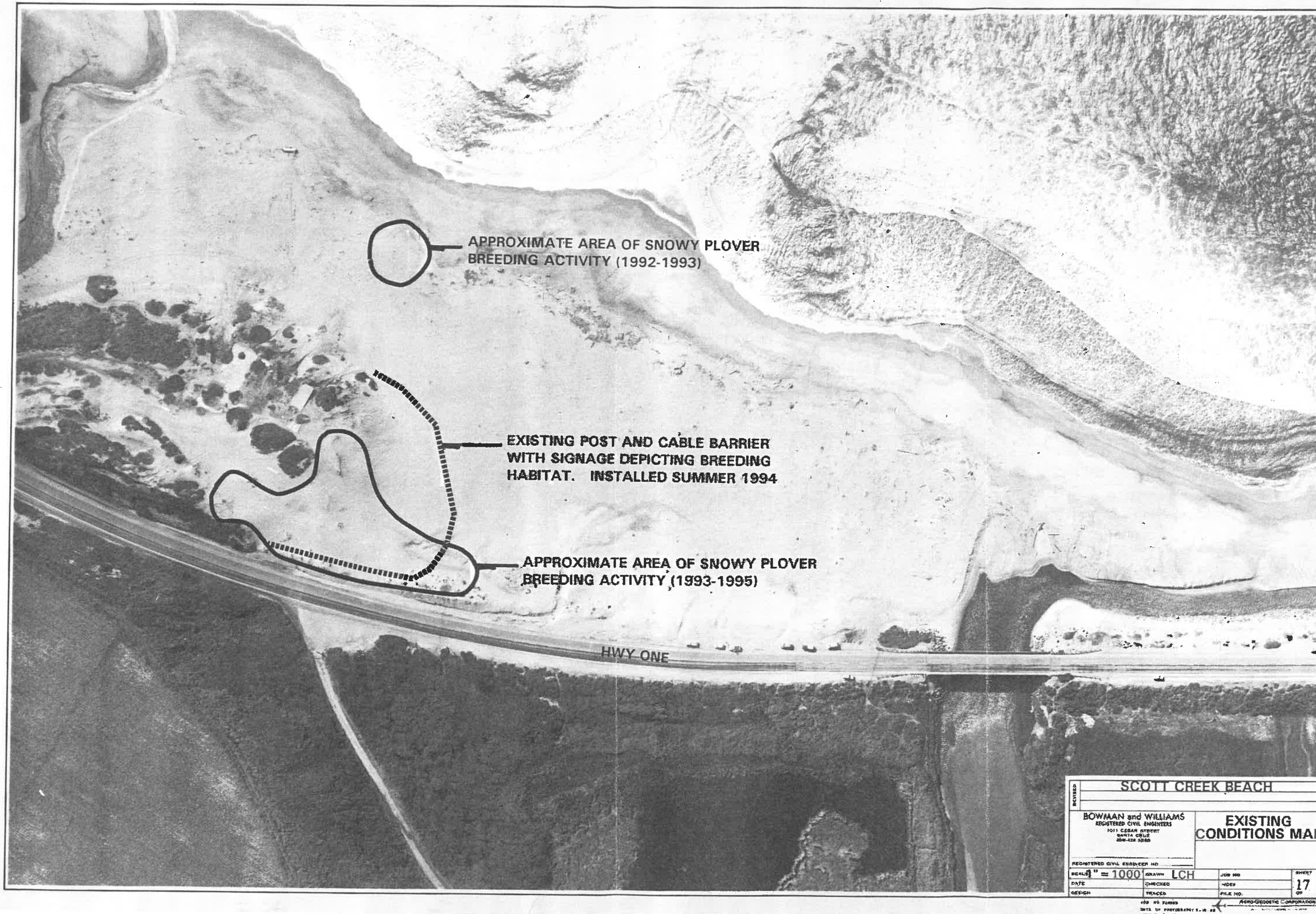
Year	Unknown	Deserted
1994	6	1

Table 7: Breeding Success of Snowy Plovers at Wilder Beach 1988-1994

Year	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged Per Egg
1988	10	27	40.0	4	40.7	11	45.5	5	0.19
1989	14	38	71.4	10	71.1	27	66.7	18	0.47
1990	17	46	47.1	8	39.1	18	27.8	5	0.11
1991	9	26	55.6	5	38.5	10	40.0	4	0.15
1992	17	47	70.6	12	70.2	33	12.2	4	0.09
1993	8	22	75.0	6	77.3	17	0.0	0	0.00
1994	13	33	53.8	7	54.5	18	66.7	12	0.36

Table 8: Causes of Snowy Plover Nest Loss at Wilder Beach 1988-1994

Year	Unkn.	People	Raven	Crow	Canine	Skunk	Gull	Predator	Wind	Tide	Desertion	Infertile
1988	2									3	1	
1989			2	1								1
1990	3	2	2			1				1		
1991	1	1			1						1	
1992	2				1		1		1			
1993								1			1	
1994	3							1	1	1		



APPROXIMATE AREA OF SNOWY PLOVER BREEDING ACTIVITY (1992-1993)
EXISTING POST AND CABLE BARRIER WITH SIGNAGE DEPICTING BREEDING HABITAT. INSTALLED SUMMER 1994
APPROXIMATE AREA OF SNOWY PLOVER BREEDING ACTIVITY (1993-1995)
HWY ONE
SCOTT CREEK BEACH
REVISED
BOWMAN and WILLIAMS
REGISTERED CIVIL ENGINEERS
1011 CEDAR STREET
SANTA CRUZ
EXISTING CONDITIONS MAP
REGISTERED CIVIL ENGINEER NO.
SCALE 1" = 1000'
DRAWN LCH
JOB NO.
SHEET 17 OF
DATE
CHECKED
INDEX
DESIGN
TRACED
FILE NO.
AERO-GEODETIC CORPORATION

CHAPTER TWO - BIOLOGICAL DATA

All biological data cited in Chapter Two of the "Biological Assessment for Snowy Plover at Scott Creek Beach" was obtained from the Federal Register/Vol. 58, No. 42/March 5, 1993.

The snowy plover is a small, pale-colored shore bird, with dark patches on either side of the upper breast and over the eyes. These dark patches are typically more prominent on the male than the female. Twelve subspecies of the snowy plover occur worldwide. Two subspecies of snowy plover are recognized in North America (Rittinghaus 1961 in Jacobs 1986); those are the western snowy plover (*Charadrys alexandrinus nivosus*) and the Cuban snowy plover (*C. a. temirostris*). According to the American Ornithologists' Union (1957), the western snowy plover breeds on the Pacific coast from southern Washington to southern Baja California, Mexico, and interior areas of Oregon, California, Nevada, New Mexico, Colorado, Kansas, Oklahoma, Texas and Arizona. The Pacific coast population of the western snowy plover is defined as those birds that nest adjacent to or near tidal waters, and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays and estuaries. The Pacific coast population of the western snowy plover is genetically isolated from western snowy plovers breeding in the interior (Gary Page, Point Reyes Bird Observatory, pers comm., 1990). Intensive banding and monitoring studies have documented only two instances of intermixing between coastal and interior populations. Additionally, snowy plover tend to be site faithful, with the majority of birds returning to the same nesting location in subsequent years (Warriner et al. 1986).

It is the coastal population of western snowy plover that is listed as Federally threatened under the Endangered Species Act, and that nest along the Santa Cruz County north coast.

Life History

The Pacific coast population of western snowy plover breed on coastal beaches from southern Washington to southern Baja California, Mexico. Sand spits, dune-backed beaches, unvegetated beach strands, open areas around estuaries, and beaches at river mouths are the preferred coastal habitats for nesting (Stenzel et al. 1981, Wilson 1980). Nesting habitat is unstable and ephemeral as a result of unconsolidated soil characteristics influenced by high winds, storms, wave action and colonization by plants. Nest sites typically occur in flat, open areas and open areas with sandy or saline substrates; vegetation and driftwood are usually sparse or absent (Wildrig 1980, Wilson 1980, Stenzel et al. 1981). Based on the most recent surveys, a total of 28 snowy plover breeding sites occur on the Pacific coast of the United States. 20 of the 28 breeding areas occur along coastal California (Page et al. 1981). Eight areas support 78% of the California breeding populations: San Francisco Bay, Monterey Bay, Morro Bay, the Callendar-Mussel Rock Dunes area, the area of Point Sal to Point Conception, the Oxnard lowland, Santa Rosa Island and San Nicholas Island (Page et al. 1991).

A majority of snowy plovers are site faithful, returning to the same breeding site in subsequent breeding seasons. Birds often nest in exactly the same location as previous years (Warriner et al. 1986). This is the case with the face of the Scott Creek Beach dune.

The breeding season of the coastal population of the western snowy plover extends from mid-March through mid-September. Nest initiation and egg laying occurs from mid-March through mid-July (Wilson 1980, Warriner et al. 1986). The usual clutch size is three eggs. Incubation averages 27 days (Warriner et al. 1986). Both sexes incubate the eggs.

Plover chicks are precocial, leaving the nest within hours after hatching to search for food. Fledging (reaching flying age) requires an average of 31 days (Warriner et al. 1986). Broods rarely remain in the nesting territory until fledging (Warriner et al. 1986, Stern et al. 1990b). Snowy plovers will renest after loss of a clutch or brood (Wilson 1980, Warriner et al. 1986). Double brooding and polygamy (i.e. the female successfully hatches more than one brood in a nesting season with different mates) have been observed in coastal California (Warriner et al. 1986). After loss of a clutch or brood or successful hatching of a nest, plovers may renest in the same colony site or move, sometimes up to several hundred miles, to other colony sites to nest (Gary Page, pers. comm., 1991; Warriner et al. 1986).

Widely varying nest success (percentage of nests hatching at least one egg) and reproduction success (number of young fledged per female or nest) are reported in the literature. Nest success ranges from 0-80% for coastal snowy plovers (Widrig 1980, Wilson 1980, Saul 1982, Wilson-Jacobs and Dorsey 1985, Wickham unpubl. data in Jacobs 1986, Warriner et al. 1986). Instances of low nest success have been attributed to predation, human disturbance and inclement weather conditions. Reproductive success ranges from 0.05 to 2.40 young per female, pair or nest (Page et al. 1977, Warriner 1980, Wilson 1980, Saul 1982, Warriner et al. 1986, Page 1988). Gary Page et al. (1977) estimated that snowy plover must fledge 0.8 young per female to maintain a stable population. Poor reproductive success, combined with permanent or long-term loss of nesting habitat to encroachment of introduced European beach grass (*Ammophila arenaria*) and urban development has led to a decline in active nesting colonies as well as an overall decline in the breeding and wintering population of the western snowy plover along the Pacific coast of the United States.

CHAPTER THREE - PROPOSED PROJECT

Project Description

The Scott Creek Beach Access Enhancement Plan proposes to facilitate public access with a boardwalk, signs, fencing, waste management and bus stop improvements. Similarly, the plan proposes to restore and protect over three acres of coastal strand and dune habitat. Where use necessitates, pedestrians will cross sensitive dune areas on a boardwalk and designated paths. Pedestrian improvements such as informational signage, waste receptacles, bike racks and fencing will be placed to aid management of public visitation. A vault toilet is proposed, thereby eliminating the need for visitors to hike across sensitive areas looking for privacy. Furthermore, in an effort to stabilize the sand dune and reduce blowing sand on the highway, approximately 1½ acres of native dune vegetation restoration is proposed in clearly delineated areas marked by interpretive signage and post and cable barriers. Other areas of the beach, approximately 2 acres above the mean high tide line, will be set aside as areas of limited disturbance for the snowy plover. (Mean high tide is approximately between elevations 4 and 6.) One area proposed for limited disturbance starts about elevation 13 - 14 and includes an area up to elevation 20 at the base of the sand dune. This area will encompass approximately one acre and the fence delineation will be designed to be flexible, thereby allowing staff to adjust the layout of the fence with the seasonal variation of the beach. A second area of limited disturbance is located on a level plateau at the crest of the sand dune. This second area is approximately one acre in size and is buffered on all sides by dune vegetation. Several open corridors will be established and maintained to aid plovers in their transition to and from the water's edge. Construction documents have been attached as an appendix to this document. A three-year dune monitoring and management program will be initiated with construction completion, as well as the continuation of the existing Snowy Plover Predator Management Program, whereby exclosures are employed to protect plover nests consistent with the exclosure protocol.

In an effort to recreate a self-sustaining dune system, native plant seeds collected from within a 20-mile radius of the site will be used to restore dune vegetation at Scott Creek Beach. A mosaic of vegetative island will be created. Each island will contain a variety of species specific to the micro-ecology of the dune area. For example, pioneering species such as *Elymus mollis* and *Camissonia cheiranthifolia* will be planted in the fore dune areas and where dune sand is unstable, such as adjacent to Highway One. Species such as *Eschscholzia californica var. maritims* and *Ericameria ericoides*, which require more stable soil, will be planted in a vegetative island located at the rear of the dune. In an effort to maximize areas for snowy plover nesting, a large level plateau will be left void of vegetation. Prostrate pioneering dune plants such as *Abronia latfolia* will be planted in vegetative islands adjacent to the areas left bare for plover nesting. It is anticipated that prostrate dune vegetation will allow nesting plover the necessary site visibility while providing some sand stabilization. All the vegetative islands will be carefully laid out to maximize plover nesting habitat and minimize the potential for sand "blow-outs", areas where wind-carried sand buries the vegetation. Finally, in dune areas that have a strong potential for human disturbance such as at the edges of delineated access paths, *Amboisia chamissonis* (beach bur) will be planted to deter human foot traffic.

Potential Impacts

The short-term potential impacts of the Scott Creek Beach Enhancement Plan will not affect snowy plover breeding activities. Construction of the project is scheduled for late fall and early winter, thereby avoiding impact during the snowy plover nesting season (March - September). Construction may affect the Scott Creek Beach wintering snowy plover population by forcing the wintering birds to other areas of the beach. As many as one hundred birds have been known to winter at Scott Creek Beach (November - March).

The long-term potential impacts of the Scott Creek Beach Access Enhancement Plan to the snowy plover are generally positive. Key areas of limited disturbance will be set aside and managed for snowy plover activities. Furthermore, the biological diversity of the area will be enhanced by the preservation and restoration of over three acres of native dune and coastal strand habitat. Finally, public awareness will be enhanced by the posting of seasonal interpretive information regarding snowy plover activities as well as other ecological significant points of interest at this coastal environment.

The adverse impact of this project is that 1 acre of existing snowy plover nesting habitat will be altered; 2/3 of this existing habitat is immediately adjacent to Highway One, and although there have been multiple nesting attempts adjacent to the highway, few of the nesting attempts have been successful. It is also possible that access improvements may encourage visitation; however, it should be noted that visitation annually increases at this beach without access improvements. It should also be noted that with these improvements, access to the beach can be better managed. Without these access improvements, it is impossible to manage or control how this beach is used and too often abused.

The access improvements proposed are intended to mitigate increased visitation by clearly delineating areas of sensitivity and by limiting human disturbance within these areas, pursuant to County Code Chapter 16.32. In addition, the proposed access improvements provide facilities for waste disposal and sanitation, thereby reducing the possibility of predators being attracted to the litter and refuse on the beach. The most significant positive impact of the proposed plan is the elimination of off-road recreational vehicles from the beach with the placement of a post and cable barrier.

The one acre of existing snowy plover nesting habitat this project proposes to alter is located immediately adjacent to Highway One and on the north face of the dune flanking the southern boundary of the beach. The entire acre is highly disturbed and void of native vegetation; restoration of this area is critical to the success of this project. In an effort to mitigate the alteration of plover habitat, the County proposes to set aside two acres of enhanced plover nesting and foraging habitat. One acre of nesting habitat will be established on the plateau at the crest of the dune. This area encompasses some existing plover nesting habitat; however, the area will be enhanced by removing exotic weeds and remnants of old buildings. A second acre of nesting/foraging habitat will be set aside at the base of the fore dune. It is anticipated that this fore dune habitat will provide lateral access to the kelp rack, an important foraging area for plover. This fore dune habitat also encompasses some existing plover nesting habitat.

The County intends to continue to work with the Point Reyes Bird attac

Management and Monitoring Plan

As a condition of approval for this project by the State Department of Fish and Game and the North Coast Beaches Advisory Committee, the County was required to develop a site-specific management and monitoring plan. This plan specifically addresses public safety and law enforcement, general maintenance, and natural resource protection. This plan proposes to monitor and manage the dune vegetation for a minimum of three years. With regard to monitoring snowy plover, the plan proposes the County implement a plover monitoring system only in the event that PRBO is unable to continue its current monitoring status. In addition to the above, however, the County will provide to the U.S. Fish and Wildlife Service an annual status report which describes all efforts to monitor and maintain successful plover nesting habitat. This report would include photo documentation and the reproductive results of the HCP.

Project Funding

The Scott Creek Beach Access Enhancement Plan is being funded by grants from four different government agencies and one private donation: the United States Federal Highway Administration, the California State Department of Natural Resources, the State Coastal Conservancy, the County of Santa Cruz, and Steven Sutherland Associates Landscape Architecture and Planning. Following is the financial summary and project cost estimate for the Scott Creek Beach Access Enhancement Plan.

SCOTT CREEK BEACH
ACCESS ENHANCEMENT PROJECT
PROJECT COST ESTIMATE

ITEM	QUANTITY	TOTAL
Clearing	178,943 SF	$ 8,912.25
Grading	124,410 SF	34,750.00
AC Paving	4,660 SF	14,000.00
Gravel Shoulder	7,400 SF	7,050.00
Bus Stop	1 EA	6,000.00
Post & Cable	952 LF	10,710.00
Boardwalk	6,880 SF	8,150.00
Native Landscaping	106,043 SF	159,065.00
Temporary Fencing	LUMP SUM	5,000.00
Comfort Station	1 EA	40,000.00
Signage	5 EA	2,500.00
Recycle Containers	1 UNIT	700.00
Construction Contingency	15%	44,525.00
Design & Permit Cost		70,710.00
TOTAL PROJECT COST		$412,072.00

SCOTT CREEK ACCESS ENHANCEMENT PROJECT
FINANCIAL SUMMARY

FUNDING SOURCE	AMOUNT
Federal Highway Administration	$290,000
State Department of Natural Resources	75,500
State Coastal Conservancy	37,072
Private Donation	9,500
TOTAL PROJECT FUNDING	412,072
County of Santa Cruz - Project/Administration Estimated Cost	73,476
TOTAL PROJECT COST	$485,548

CHAPTER FOUR - MITIGATION MEASURES

The County proposes to mitigate the potential impacts of the Scott Creek Beach Access Enhancement Plan through the following actions:

- The County will set aside two acres of coastal strand and dune habitat at Scott Creek Beach as an area of limited disturbance intended and managed as a snowy plover refuge. Snowy plovers would be able to nest and/or retreat to this area during times of intensive public use of the beach.
- The County will manage public access by maintaining appropriate access facilities such as fencing, boardwalks, restrooms, and signage.
- The County will post and maintain snowy plover interpretive information/signage at County-managed beaches.
- The County will continue its snowy plover predator exclosure program under Permit Number PRT-702631, effective through January 31, 1998, at both Scott Creek Beach and Laguna Creek Beach. This program costs the County approximately $5,000 per year to administer, and will be an on-going program on County-managed beaches.
- The County will continue to educate special interest/user groups to the concerns of the snowy plover.

Project Alternatives

The Scott Creek Beach Access Enhancement Plan is the County's fourth attempt to address the unmanaged access issue at Scott Creek Beach. In 1983 the County obtained a State Coastal Conservancy grant to control off-road vehicular access at Scott Creek Beach. A vehicle barrier was constructed adjacent to the road. Two years later, Caltrans removed the barrier because the barrier was buried in drifts of unstable sand, and caused road maintenance and operational problems.

In 1989, two different beach access scenarios were considered and reviewed. One scenario proposed beach access from a bluff-top parking area north of the beach. The second scenario proposed beach access from a parking area south of the beach in an old railroad cut. In the 1989 EIR, both scenarios were considered to create unmitigatible significant adverse impacts. The first scenario created an adverse visual impact from the "scenic highway" Highway One. The second scenario would significantly impact a diverse and mature stand of coastal scrub and rare plant habitat for purple-flowered piperia. As a result of these unavoidable adverse impacts, neither plan was adopted.

Due to the proximity of the Highway One to Scott Creek Beach, human access must be addressed. The Scott Creek Beach Access Enhancement Plan is the synthesis of these previous proposals whereby unmitigatible aspects have been eliminated from the plan. In 1992, prior to the discovery and return of snowy plover, the Scott Creek Beach Access Enhancement Plan was adopted by the County Board of Supervisors. Currently this plan, in its entirety, is undergoing a second environmental review in which impacts to snowy plover will be assessed.

No Project Option

Seventy percent (70%) of the funding for the Scott Creek Beach Assess Enhancement Project is provided by the Federal Transportation Enhancement Act (TEA). Funding for this project was approved on a competitive basis specifically for highway landscaping and beautification. Dune restoration is the key criteria for this funding source, and the key element to the project's success. Should the U. S. Fish and Wildlife Service deny the County permission to restore the Scott Creek Beach dune system, and thereby modify one acre of existing plover nesting habitat, as proposed with mitigation measures, the County will lose the funding for this project. If the County loses the $290,000 federal (TEA) funding for this project, the project will be abandoned unless other funding sources are obtained, which is highly unlikely given the fiscal constraints of today's economy and the precedence set by the U.S. Fish and Wildlife Service denying the permit for this project. In the meantime, the County will be unable to manage or control beach access. All-terrain vehicles will continue to access the beach illegally, continuing the degradation of dune and plover nesting habitat.

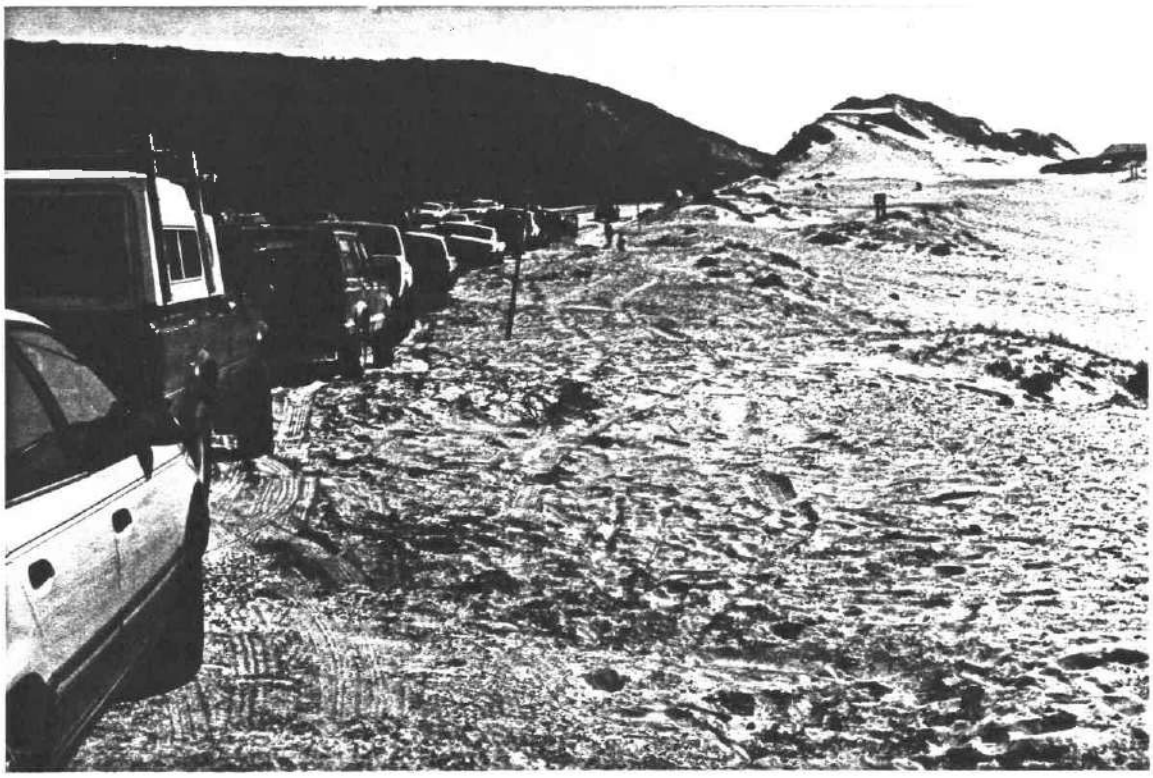


Photo: Staff

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Nesting Success of Snowy Plovers at Waddell Beach, Santa Cruz County, California, 1994. Douglas E. George.

Nesting Success of Snowy Plovers at Wilder Beach, Santa Cruz County, California, 1994. Douglas E. George.

APPENDIX A

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

California Gnatcatcher
Western Snowy Plover
AMENDMENT# 10

3-201
(10 86)

FEDERAL FISH AND WILDLIFE PERMIT

1. PERMITTEE

U.S. FISH & WILDLIFE SERVICE
REG, DIR., REGION 1
911 N.E. 11TH AVENUE
PORTLAND OR 97232

2. AUTHORITY-STATUTES
16 USC 1539 (a)
16 USC 1533 (d)
REGULATIONS (Attached)
50 CFR 17.22
50 CFR 17.32

3. NUMBER
PRT-702631

4. RENEWABLE	5. MAY COPY
XX ☐ YES ☐ NO	XX ☐ YES ☐ NO

6. EFFECTIVE	7. EXPIRES
4/ 1/93	1/31/98

8. NAME AND TITLE OF PRINCIPAL OFFICER (If #1 is a business)
REGIONAL DIRECTOR
MARVIN L. PLENERT

9. TYPE OF PERMIT
ENDANGERED/THREATENED SPECIES

10. LOCATION WHERE AUTHORIZED ACTIVITY MAY BE CONDUCTED
REGION ONE

11. CONDITIONS AND AUTHORIZATIONS:

A. GENERAL CONDITIONS SET OUT IN SUBPART D OF 50 CFR 13, AND SPECIFIC CONDITIONS CONTAINED IN FEDERAL REGULATIONS CITED IN BLOCK #2 ABOVE, ARE HEREBY MADE A PART OF THIS PERMIT. ALL ACTIVITIES AUTHORIZED HEREIN MUST BE CARRIED OUT IN ACCORD WITH AND FOR THE PURPOSES DESCRIBED IN THE APPLICATION SUBMITTED. CONTINUED VALIDITY, OR RENEWAL, OF THIS PERMIT IS SUBJECT TO COMPLETE AND TIMELY COMPLIANCE WITH ALL APPLICABLE CONDITIONS, INCLUDING THE FILING OF ALL REQUIRED INFORMATION AND REPORTS.

B. THE VALIDITY OF THIS PERMIT IS ALSO CONDITIONED UPON STRICT OBSERVANCE OF ALL APPLICABLE FOREIGN, STATE, LOCAL OR OTHER FEDERAL LAW.

C. VALID FOR USE BY PERMITTEE NAMED ABOVE.

D. Acceptance of this permit serves as evidence that the permittee understands and agrees to abide by the "Special Conditions for Marine Mammals and Native Endangered and Threatened Species" (copy attached).

E. Authorized to take listed species identified on the attached sheets for scientific purposes or the enhancement of propagation or survival for approved recovery activities and as conditioned below.

F. Prior to conducting any activities not excluded under the Service's NEPA categorical exclusions (516 DM 6, Appendix I) the permittee must ensure that all NEPA requirements have been satisfied.

☐ ADDITIONAL CONDITIONS AND AUTHORIZATIONS ON REVERSE ALSO APPLY ...Continued...

12. REPORTING REQUIREMENTS

FIRST ANNUAL REPORT DUE 1/31/94
SUBMIT COMPLETE REPORT TO: OMA, 4401 N. FAIRFAX DR., ROOM 432
ARLINGTON, VA 22203, BY 1/31 FOLLOWING EA YR PERMIT IS IN EFFECT

ISSUED BY	TITLE	DATE
[signature]	CHIEF, BRANCH OF PERMITS, OMA	4/ 1/93

ORIGINAL

G. Permittee must monitor each action taken under this permit to assure that the limits specified in each subpermit are not exceeded and that research efforts and handling of individual species is not duplicated by overlapping research.

H. This permit is conditioned upon all applicable policy and guidance.

I. Subpermittee's must be designated in writing.

J. Subpermittee's must be required to hold and transport living specimens captured in the wild according to the provisions and procedures outlined in professionally established protocols for the handling and transport of the affected species.

K. Procedures will be instituted to ensure that disease transmission does not occur during tissue sampling or other invasive procedures and that such activities are only performed by persons skilled in the techniques of handling the affected species.

L. The permittee must ensure that all appropriate Section 7 consultation requirements have been completed prior to initiating any otherwise permitted activities and that no action taken under this permit will violate subsection 7(a)(2) of the U.S. Endangered Species Act.

Terms and Conditions for
PRBOCA

1. The conditions set forth in this permit supersede any previous permits issued by the U.S. Fish and Wildlife Service (Service).

2. The location of the permitted activities is coastal beaches of Santa Cruz, Monterey, and Santa Barbara Counties (including Santa Rosa Island).

3. Individuals designated to capture and handle western snowy plovers and erect exclosures pursuant to this permit are:

   Carleton Eyster, Douglas George, Gary Page, Bernadette Ramer, Lynne Stenzel, Jane Warriner, John Warriner, and Katherine Wilson.

   No other individuals are authorized to independently capture or handle western snowy plovers under this permit.

   The individual designated to erect exclosures only pursuant to this permit is:

   Lacy Holtzworth with Santa Cruz County.

   Individuals assisting the permittees in deployment of exclosures must receive training by Service authorized instructors in the design, construction, and set up of exclosures prior to deployment in the field (see attached list). The permittees must supervise assistants at all times during exclosure set up.

4. The number of western snowy plovers allowed to be accidentally injured or killed during trapping, handling, banding, and erection of exclosures is three birds per year. The number of eggs allowed to be damaged or destroyed is three per year. All mortalities must be reported within 3 days of occurrence.

   In the event that more animals are killed or injured, or eggs damaged or destroyed, than specified above, the permittee shall follow the steps outlined in general permit condition No. 6. Verbal and written notification shall be made to the Ventura Field Office (805-644-1766) as well as the Portland Regional Office (503-231-6241).

   The depository designated to receive preserved specimens is the California Academy of Sciences or the University of California, Berkeley, Museum of Vertebrate Zoology. The permittee shall supply the depository with a copy of this permit to validate that the specimens supplied to the museum were taken pursuant to a permit.

5. This permit authorizes the capture/recapture of all individual adult, pre-flight juvenile, and fledgling western snowy plovers within the geographic boundaries and time limitation specified above. The erection of exclosures around western snowy plover nests and the handling and floating of eggs are also authorized.

Individuals captured may be measured in hand, banded with Service aluminum bands and color bands, and shall be released at the capture site within 15 minutes of capture provided that safety of the individual bird is not compromised, if the following conditions are followed:

a. Capture is by use of drop traps, walk-in traps, monofilament snare mats, or by hand, around the nest and in feeding and roosting areas away from nesting areas.

b. Not more than 20 minutes shall be spent in any 1-day attempting to capture an individual bird.

c. No more than two attempts shall be made to capture an individual during the nesting season.

d. Pre-flight juveniles shall not be disturbed if the ambient temperature exceeds 90 degrees Fahrenheit.

e. Pre-flight juveniles shall not be pursued for more than 2 minutes.

6. Handling of western snowy plovers is permitted only when required for biological surveys and other research. No other handling is permitted. No handling of western snowy plovers shall occur prior to the Services approval of the research design for which the handling is required.

7. If exclosures are deployed as part of this permit, the permittee must use Service-approved exclosure protocols, or receive written permission from the Service to vary from these protocols. Service-approved protocols are attached.

8. All color-marking shall be coordinated with and approved by the U.S. Fish and Wildlife Service, Division of Ecological Services, 2800 Cottage Way, Room E-1803, Sacramento, California 95825-1846 (916-978-4866), and the National Biological Survey, Bird Banding Laboratory, Patuxent Wildlife Research Center, Gabrielson Lab, 12100 Beech Forest Road, Laurel, MD 20708-0422 (301-497-5942).

9. Where capture and handling of snowy plovers occurs within a nesting colony of the endangered California least tern, the permittee shall first obtain permission from the Services, Carlsbad Field Office at (619) 431-9440 (Los Angeles to San Diego County), Ventura Field Office at (805) 644-1766 (Ventura to Santa Cruz County), or Sacramento Field Office at (916) 978-4866 (San Mateo to Del Norte County) to coordinate activities with the individual(s) monitoring the least tern colony, so as to reduce disturbance of the nesting colony to a minimum.

10. The authorization of this permit is dependent upon compliance with all State regulations and Permit No. 09316, the Federal Bird Marking and Salvaging Permit, issued by the National Biological Survey, Bird Banding Laboratory.

11. At the discretion of the Service, a Service employee may inspect the facilities or accompany the permittee during any activity conducted pursuant to this permit. The permittee shall allow Service personnel

complete and immediate access to any materials and information generated as a result of this permit. Any refusal, obstruction, or hindrance of Service participation in such work shall be grounds for suspension or revocation of this permit in accordance with 50 CFR 13.27 or 50 CFR 13.28, respectively.

12. Annual reports shall be submitted to the U.S. Fish and Wildlife Service, Portland Regional Office, Ecological Services, 911 NE 11th Avenue, Portland, Oregon 97232-4181, and to the U.S. Fish and Wildlife Service, Ecological Services, Ventura Field Office, 2140 Eastman Avenue, Suite 100, Ventura, California 93003, and the Sacramento Field Office, 2800 Cottage Way, Room E-1803, Sacramento, California 95825.

    Reports shall follow the format specified in general permit condition No. 8. Reports shall include, if applicable, techniques used and effectiveness of trapping, the location, number, sex, age, and breeding status, if determinable, of each banded bird. If exclosures are employed as part of this permit, the report shall include a description of the exclosure design; the number and location of exclosures and date(s) deployed and removed; the hatching and fledgling success of enclosed nests; the fate of adults within exclosures; an account of any plover mortalities associated with enclosures, and the probable cause of these mortalities. The report shall also include the number of staff hours spent and funding expended for this study.

U.S. FISH AND WILDLIFE SERVICE
EXCLOSURE PROTOCOLS FOR SNOWY PLOVER NESTS
JANUARY, 1994

The purpose of these protocols is to provide standard guidelines for permittees who have been approved to use exclosures to protect nests of the coastal population of the western snowy plover (Charadrius alexandrinus nivosus). Information presented here is based on work conducted in California and Oregon, scientific literature describing use of exclosures to protect Atlantic coast piping plovers, and personal communications with biologists protecting plovers with exclosures.

I. Determine Whether Exclosures Are Appropriate

Exclosures should be used only if nest success of plovers is low because of predation or human impacts (i.e., ORV's, horses, high public use areas). Exclosures should be used only when other less intrusive alternatives to protect nests are not appropriate, effective, or practical.

Alternatives include closing breeding areas to public use during the breeding season (March 1 through September 15) or portions thereof, if human disturbance is a limiting factor in nest success. Barriers (e.g., fences) may be used in some breeding areas (i.e., peninsulas, levees, etc.) to prevent people and/or predators from disturbing or destroying nests. These alternatives can effectively protect nests (and possibly chicks) without disclosing individual nest locations or causing disturbance to the adults.

II. Goals of Exclosure Use

Rimmer and Deblinger (1990) described their goals in designing an exclosure to protect Atlantic coast piping plovers. These goals shall be met when designing and implementing any predator exclosure program for the western snowy plover:

A. predators should be unable to penetrate an exclosure;
B. exclosures should allow unimpeded movements of plover adults and chicks between the nest, foraging, and roosting areas, etc.;
C. plover breeding behavior should not be significantly disrupted.

Exclosures shall not be erected:

A. when a nest is close to high tideline and will be flooded;
B. if there is a potential conflict with other endangered species.

III. Exclosure Design and Construction

Presented in this section are protocols for two exclosure designs which the Service has determined to effectively deter ground and aerial predation on snowy plover nests. The design and construction of the triangular and circular exclosures are as follows:

A. The Triangular Exclosure

In central coastal California 254 triangular exclosures have been erected during the last three years (1991-1993) (Parker et al. 1992; USFWS unpubl. data; Point Reyes Bird Observatory (PRBO), unpubl. data). A total of 3 protected nests have been preyed upon by mammals (1 non-native red fox, 2 skunks) (PRBO, unpubl. data). Although Deblinger et al. (1992) made no recommendation for the style of exclosures to use, it

should be noted that triangular exclosures experienced no predation during their study. Tops should only be used on the triangular exclosure when avian predation has been documented and is a potential problem. Figure 1 shows the design of a triangular exclosure.

Exclosures shall be:

1. triangular in shape with a minimum perimeter of 22.8 m;
2. made of metal mesh fence (5x5 or 5x10 cm), 3 pre-cut sides each 7.6 m in length (5x10 cm is the minimum in red fox areas);
3. supported by at least 6 sturdy metal 154-cm fence posts;
4. have a fence height of at least 122 cm above the sand and buried 20 cm in soft earth or sand;
5. erected in under 30 minutes without tops, 45 minutes with tops;
6. erected around complete clutches (usually 3 eggs) unless accelerated predation rates warrant construction prior to the clutch completion;
7. erected by a minimum of 2 persons, 1 person must have been trained by an experienced exclosure builder;
8. colored nylon webbing along the top edge may be used to alert birds to presence of the structure and therefore avoid "bird strikes".

Methods for construction of triangular exclosures:

1. prior to construction, assign tasks to individuals to avoid confusion during set-up;
2. upon arrival at the nest site, cover the nest with a bright object (hat, rag, etc.) to shade the eggs from the sun and prevent the nest from accidentally being stepped on;
3. use a rope as a guide to simulate the perimeter of the exclosure with the nest centered within the rope outline;
4. pound six 1 cm x 244 cm steel reinforcement bars (rebar), three corners and three supports, approximately 122 cm into the ground;
5. dig a trench, at least 20 cm deep, around the perimeter (follow the guide rope);
6. carefully place the three 7.60 m long walls, made of mesh wire, into the trenches;
7. fasten the wire to the rebar posts using standard, brass hog rings, removing all slack from the wire and insuring the wire will be buried at least 20 cm;
8. bend the top 10-15 cm of wire outward at a 45 degree angle to discourage mammalian predators from climbing over the exclosure
9. refill the trenches, insuring that the wire lies flush with the sand surface, allowing plovers to move freely through the exclosure;
10. rake the area to remove footprints and level the sand;
11. upon completion, leave the area immediately.

If a top is included, tops should be:

1. made of black seiners twine (or comparable material), avoid using clear monofilament line or fish netting;
2. twine should be set in parallel rows 15 cm apart.

Methods for construction of tops:

1. prior to exclosure set-up, ready enough wood strapping (2.5 x 5 cm) to be attached to two sides of the exclosure;
2. on the wood strapping, place small hooks, used to hold the

twine, at 15 cm intervals;
3. after completion of exclosure perimeter, attach wood strapping (2.5 cm x 5 cm) along 2 sides of the exclosure with bailing wire;
4. attach twine to hooks creating parallel rows as you move along the exclosure, ensuring the twine is taut;
5. if twine loosens, tighten it by wrapping it around the hooks.

B. The Circular Exclosure

In Oregon, a circular exclosure design with a top has proven an effective means of deterring ground and aerial predation on snowy plover nests. In one study at sites along the Oregon Coast in 1990 to 1993, 85 percent (n=66) of plover nest with exclosures hatched compared to only 15 percent (n=67) of unprotected nests (Stern 1994). The circular exclosure maximizes the distance between the edge of the exclosure and the nest. Figure 2 shows the design of a circular exclosure.

Exclosures shall be:

1. generally circular in shape with a 20.3 m perimeter;
2. made of 122 cm tall mesh fence with 5 x 5 cm mesh size;
3. supported by 8 - 154 cm tall steel posts;
4. achieve a fence height of 106.7 cm above ground with 15.2 cm buried;
5. erected in under 60 minutes, including top;
6. erected by a minimum of 2 persons, with one person previously trained by an experienced exclosure builder;
7. erected around complete clutches unless accelerated predation rates warrant construction prior to the clutch completion;
8. colored nylon webbing along the top edge may be used to alert birds to presence of the structure and therefore avoid "bird strikes".

Methods for construction of exclosures:

1. prior to arrival at the nest site wipe oil off of the 20.3 m length of metal mesh fence, connect ends to each other, making sure that no sharp points protrude at the place of joining, then role up the fence;

2. prior to arrival at the nest site, assign tasks to individuals, and provide training and explanation to new exclosure builders;

3. upon arrival at the nest site, float the eggs to determine incubation stage, then place a cap over the eggs to protect the eggs from the sun, and to mark the location of the nest;

4. unroll fencing material so that the middle of the fence is about 10 m from the nest, and the fence ends are equidistant from the nests;

5. have each person take a fence post in hand or place it nearby;

6. have one person pick up the top half of fence, and at once lift and pull the fence to extend over and beyond the nest, then gently stand up the exclosure;

7. place the two fence posts inside the exclosure and have both persons stretch the fence slightly;

8. have one person pound in the first fence post, then assist the second person pound in the second fence post;

9. pound in remaining fence posts at equidistances, gently stretching fencing to attain desired configuration;

10. dig a 15.2 cm trench with hands or a trowel underneath the bottom of the fence, pull the fence down into the trench, then refill with sand;

11. level the sand around the enclosure with horizontal stretches of mesh;

12. pound all fence posts in further so that the tops are about 5 cm below the top of the wire;

13. upon completion, leave the area immediately.

If a top is included, it should be:

1. made of black seiners twine (or comparable material), avoid using clear monofilament line or fish netting;
2. twine should be set in parallel rows 15 cm apart.

Methods for construction of tops:

1. extend the twine across the exclosure, tying ends off on each parallel row;

2. each row should have the same degree of tightness;

3. Run one row of twine in perpendicular direction, bisecting each row at midpoint, thus providing support to the rows of twine.

III. Timing of Exclosure Set-up

Exclosures may not be erected under the following conditions:

A. on windy (> 20 mph) or rainy days
B. 2 hours or less before sunset
C. less than 1.5 hours after sunrise
D. when the air temperature exceeds 80F F SMLSAR 0,'Journal[Run WPT]^OD
E. during constant or steady rain.

IV. Monitoring Exclosures

Exclosures must be monitored at least twice per week. Information gathered should include:

1. fate of the eggs
2. presence or absence of incubating bird and mate
3. status of exclosure
4. presence of predators
5. other disturbances.

LITERATURE CITED

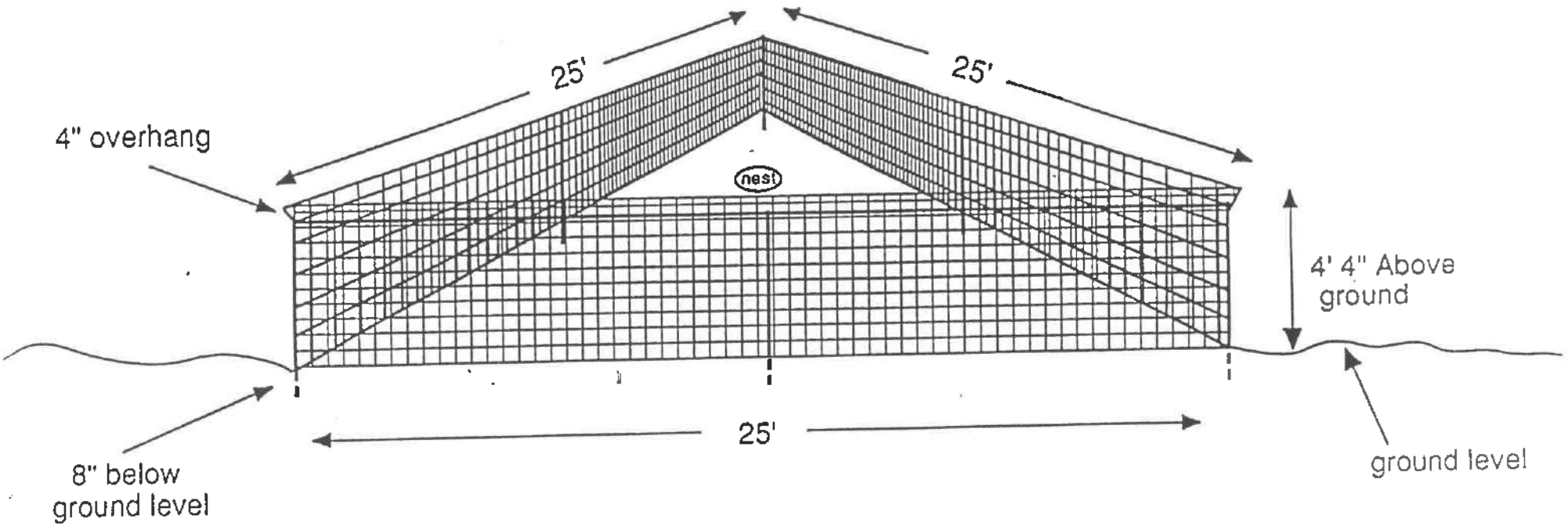
Deblinger, R.D., J.J. Vaske, and D.W. Rimmer. 1992. An evaluation of different predator exclosures used to protect Atlantic coast Piping Plover nests. Wildlife Society Bulletin. 20:274-279.

Rimmer, D.W. and R.D. Deblinger. 1990. Use of predator exclosures to protect Piping Plover nests. J. Field Ornithol. 61(2):217-223.

Parker, M.W., J.E. Takekawa, D.L. Roster, J.S. Warriner, and J.C. Warriner. 1992. Predator exclosures for Snowy Plover nests. Presentation at Western Section of The Wildlife Society. San Diego, California.

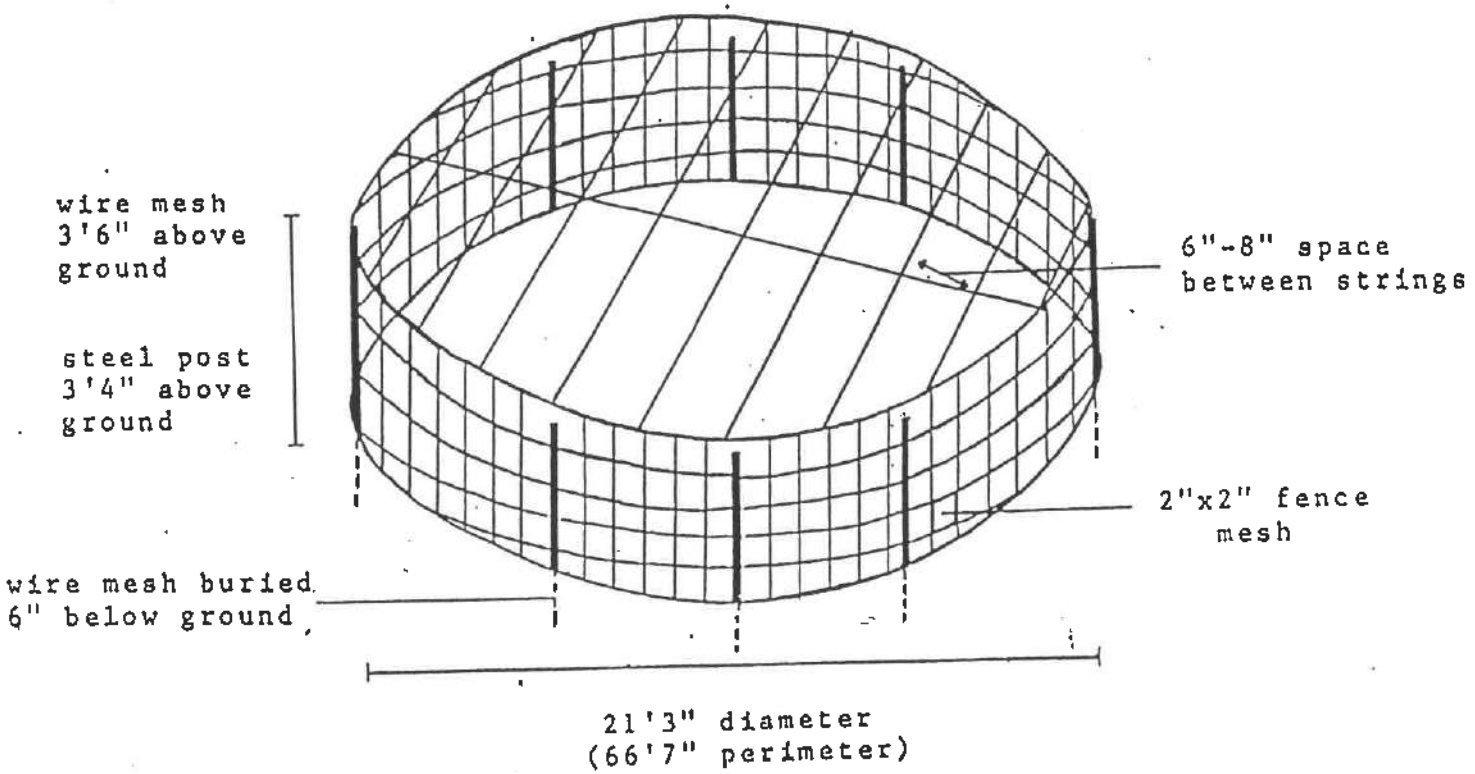
Stern, M. 1994. Reproductive ecology and management of snowy plovers on the Oregon coast. Paper presented at the annual meeting of the Oregon Chapter of The Wildlife Society. Sunriver, Oregon.

FIGURE 1. TRIANGULAR EXCLOSURE DESIGN



SOURCE: M. PARKER, SAN FRANCISCO BAY NATIONAL WILDLIFE REFUGE

FIGURE 2. CIRCULAR EXCLOSURE DESIGN



SOURCE: M. STERN, THE NATURE CONSERVANCY

INDIVIDUALS AUTHORIZED BY THE FISH AND WILDLIFE SERVICE AS INSTRUCTORS IN THE CONSTRUCTION AND SET-UP OF EXCLOSURES FOR NESTING WESTERN SNOWY PLOVERS
JANUARY, 1994

California:

1. Michael Parker
San Francisco Bay National Wildlife Refuge
510-792-0222

2. Elaine Harding-Smith
San Francisco Bay National Wildlife Refuge
510-792-0222

3. Dave Dixon
California Department of Parks and Recreation
408-384-7695

4. Lacy Holtzworth
County of Santa Cruz
408-462-8321

5. Douglas George
Point Reyes Bird Observatory
415-868-1221

6. Bernadette Ramer
Point Reyes Bird Observatory
415-868-1221

7. Carleton Eyster
Point Reyes Bird Observatory
415-868-1221

Oregon:

1. Mark Stern
The Nature Conservancy
503-228-9561

2. Ginny Rosenberg
TNC Volunteer
503-621-3538

3. Bruce Casler
TNC Volunteer
503-229-5078 (w)
503-628-0780 (h)

4. Carole Hallette
TNC Volunteer
503-628-0780

5. Melissa Platt
Oregon Department of Fish and Wildlife
503-757-4186

6. Dave Craig
TNC Volunteer
303-786-8742

Washington:

None

Construction Documents for

NORTH COAST BEACHES - PHASE I
Scott Creek Beach Access and Habitat Restoration

North Coast Beaches Advisory Representation:

Rural Bonny Doon Association
South Bay Naturists
Rancho Del Oso Nature Center
North Coast Improvement Association
Santa Cruz Surfing Association
Santa Cruz Board Sailing Association
Save Our Shores
Monterey Bay Hang Gliding Association
North Coast Residents
Davenport Volunteer Fire Department
North Coast Farmers

Board of Supervisors:
(408) 454-2200

Jan Beautz
Walter J. Symons
Wendy Wormhoudt
Ray Belgard
Fred Keeley

Parks, Open Spaces and Cultural Services:

Barry C. Samuel - Director (408) 462-8300
Dave Mitchell - Chief, Park Planning
Lacy Holtzworth - Project Manager, Owner's Representative (408) 462-8330
Gretchen Hill - Chief Facilities Division

General Notes

All work shall conform to, but not be limited to the following:
Zoning and ordinance regulations of the County of Santa Cruz and the rules, regulations, and requirements of all governmental agencies having jurisdiction over the work, and of the service and utility companies serving the site and building, all Federal and State of California laws, rules and regulations including O.S.H.A.

NOTICE TO ALL CONTRACTORS

If in the opinion of the contractor or any sub-contractor, instructions, details or information contained in these drawings or specifications is at variance with or does not comply with any of the codes or requirements described in these General Notes, the contractor shall immediately report the same to the Owner's Representative before proceeding with that phase of the work.

1. Prior to bidding, the Contractor shall visit the site & familiarize herself or himself with the existing conditions affecting the new work. The Contractor shall not dispute, complain, or assert that there is any misunderstanding in regards to location, extent, nature or amount of work to be performed under this contract due to the contractors' failure to inspect the site.

2. The Contractor shall call U.S.A. (Underground Service Alert) 800-642-2444 prior to beginning any construction or excavation work for proper identification of public utilities on or adjacent to site.

3. All known existing utilities and site improvements are shown on the plans. The contractor shall proceed with due caution during construction so as not to damage any existing improvements, vegetation, or features not scheduled for modification. Contractor shall repair or replace all such items damaged during construction to an "as-was" or better condition, subject to the Owner's Representative's discretion, at no extra cost to the Owner.

4. Prior to installing any pipe, contractor shall excavate and verify the exact location of all utilities which cross the line of construction. All modifications to the existing system shall match existing grades, inverts, and alignments unless otherwise noted. The Contractor shall verify all dimensions and conditions at the job site before commencing work and shall report any discrepancies to the Owner's Representative.

5. The Contractor shall investigate and acquire all required local, county, state, or federal permits necessary to perform construction at the site at no additional cost to the owner. Contact the Owner's Representative for additional information prior to investigation. It is currently understood that there are five(5) permits required for this project. Three(3) are being provided by the Owner at no cost to the Contractor. They are: 1. Department of Fish and Game permit, 2. Water grading permit, 3. County development permit. Two(2) are to be provided by the Contractor at the Contractors cost. They are: 1. Caltrans Encroachment permit, 2. OSHA trenching permit. The Contractor shall maintain copies of all permits on site at all times.

6. Contractor shall provide adequate noise and dust control in accordance with the requirements of the County of Santa Cruz and the discretion of the Owner's Representative.

7. Upon completion of the work, the contractor shall certify that all work has been performed in accordance with the requirements of the contract documents. Variations shall be declared and presented to the Owner's Rep. in writing and on record drawings prior to final acceptance.

8. Contractor shall insure positive drainage to existing drainage structures at all times during the course of construction.

9. Contractor shall stake the Layout Plan in the field per the written dimensions and have such staking reviewed by the Owner's Representative prior to proceeding with construction. If no dimension is shown, consult with Owner's Representative prior to proceeding.

10. Details shown shall be incorporated into the project at all appropriate locations whether specifically noted out or not.

11. During the process of construction, the contractor shall keep the construction site and immediately adjacent areas in a neat and clean condition, disposing of refuse in a legal and satisfactory manner as required and as per the discretion of the Owner's Representative, such that at no time will there be an unsightly accumulation of rubbish. At no time shall the Contractor allow fuel or other toxic waste to wash into the creek bed. All chemical spills shall be cleaned up and disposed of in a legal manner immediately.

12. All work shall be performed in accordance with the project Specifications, these Construction Documents, and the State of California Dept. of Transportation Standard Specifications of the latest issue at the time of issuance of these documents.

13. Contractor shall be responsible for perserving the integrity of any existing buildings, utilities, vegetation and other improvements not scheduled for removal on or off the site.

14. All construction shall conform with recommendations within the approved Geotechnical and Coastal Engineering investigation prepared by Hara, Kasunich & Associates, Inc., Project No. SC3254, dated June 2,1993.

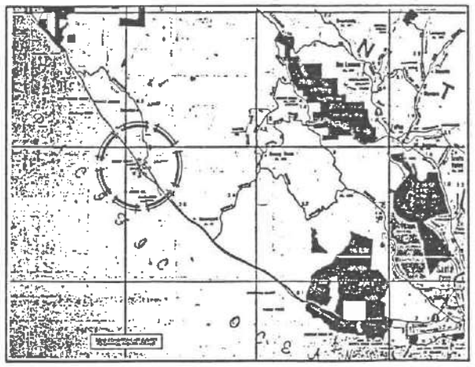
15. The Soil Engineer shall be notified by the Contractor at least four (4) working days prior to any site clearing or grading, so that the work in the field can be coordinated with the grading contractor, and arrangements for testing and observation services can be made. The Owner's Representative shall be informed of, and invited to, all site meetings between the Contractor and Soil Engineer.

16. The Contractor shall be solely responsible for acquiring and providing all required construction water, water for dust control and water for irrigation, at no extra cost to the Owner throughout the construction and maintenance period.

17. The entire work shall comply in all respects with but not necessarily limited to the following:

1991 Uniform Building Code with current California State amendments
1988 Uniform plumbing Code with current California State amendments
1994 California Electrical Code
1992 Americans with Disabilities Act
CCR Title 19 & 24

Vicinity Map



Consultants

Prime Consultant
Steven Sutherland & Associates, Landscape Architects
303 Potrero St. Ste 40-C, Santa Cruz, CA 95060-2756
Steven Sutherland, Principal
Patti Kreberg, Dune Biologist
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Fax: (408) 459-0484

Surveying & Civil Engineering
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1011 Cedar St., Santa Cruz, CA 95060
Victor Lauderbach, Principal
Tom Mason, Project Manager
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Fax: (408) 426-9182

Geotechnical & Coastal Engineering
Hara, Kasunich & Associates
441 E. Lake Ave., Watsonville, CA 95076
John Kasunich, Principal
Rick Parks, Project Manager
Phone: (408) 722-4175
Fax: (408) 722-3202

Drawing Index

Set No.

Steven Sutherland & Associates Landscape Architects

Landscape Architecture
Site Planning

303 Potrero St. Ste 40-C
Santa Cruz, CA 95060-2756
(408) 459-0455

Cal Landscape Architect
Lic #2805

NORTH COAST BEACHES
Scott Creek Beach
County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

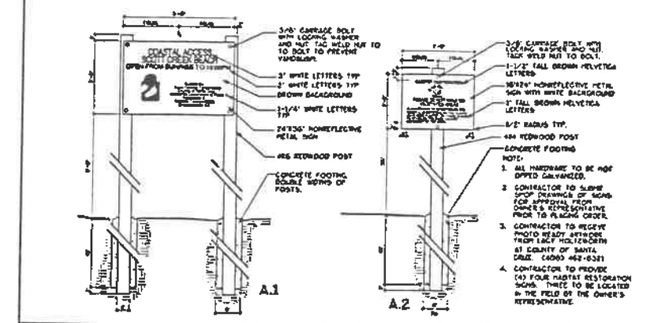
DRAWING ISSUED		
DATE	PURPOSE	BY
5-15-95		CWLS
1/12/96		CWLS

SCALE:

SHEET TITLE: TITLE SHEET

SHEET NUMBER: T-1

APPENDIX B



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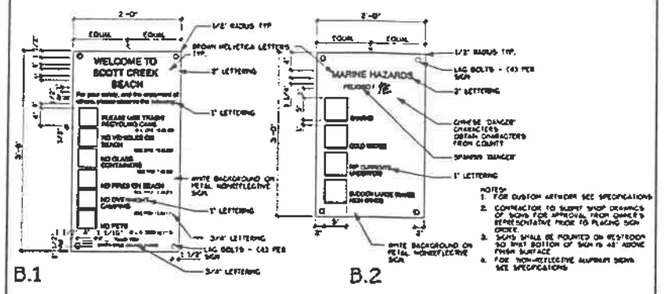

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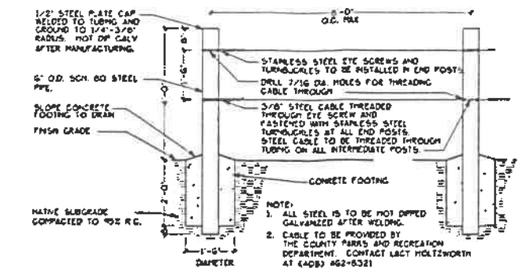

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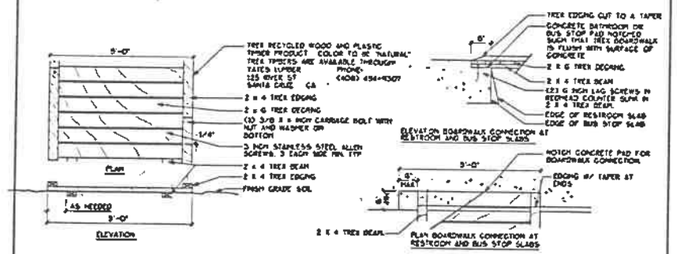

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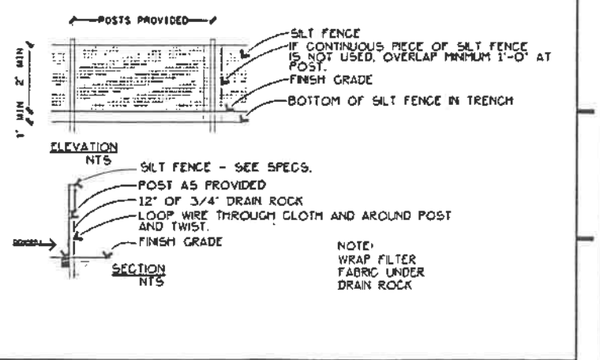

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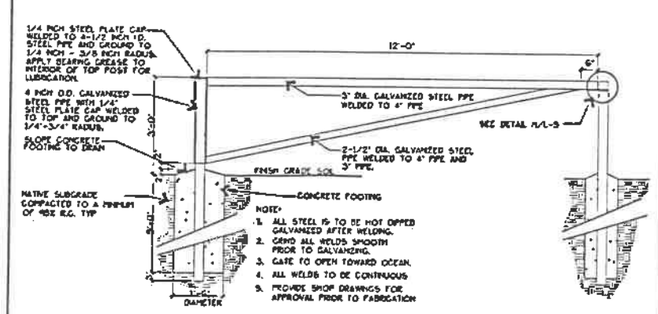

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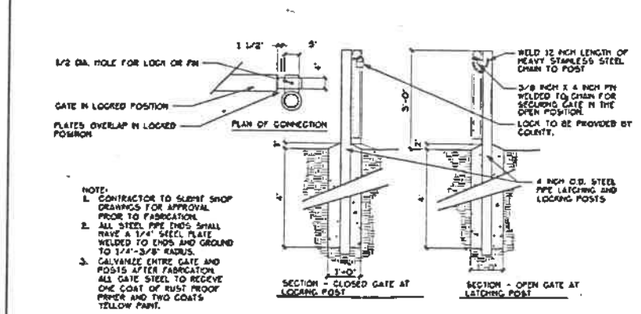

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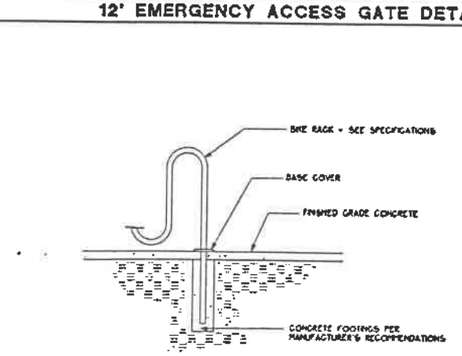

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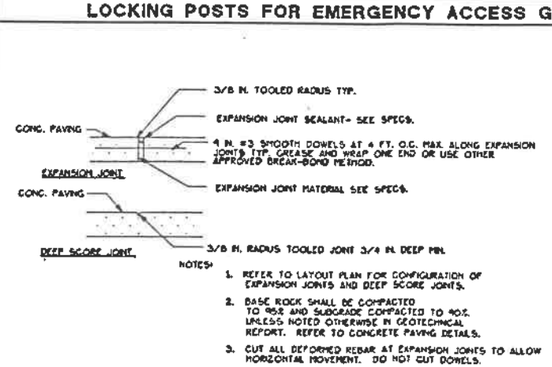

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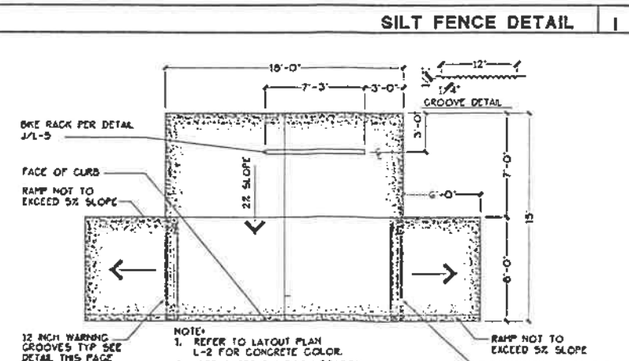

BUS STOP PAD LAYOUT | L

Steven Sutherland & Associates Landscape Architects

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Cal Landscape Architect
Lic #2505

NORTH COAST BEACHES
Scott Creek Beach

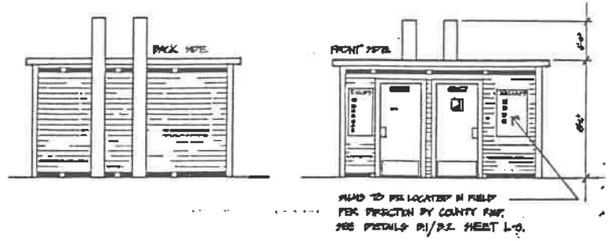
County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

DRAWING ISSUED		
DATE	PURPOSE	BY
5-15-95		CWL
7-12-96	BID	CWL

SCALE: NOT TO SCALE

SHEET TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: L-5



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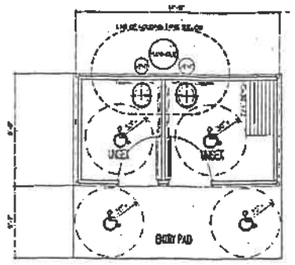

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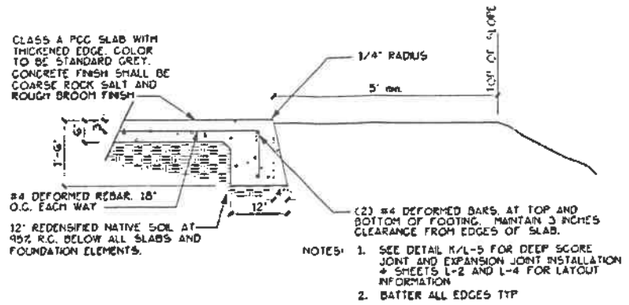
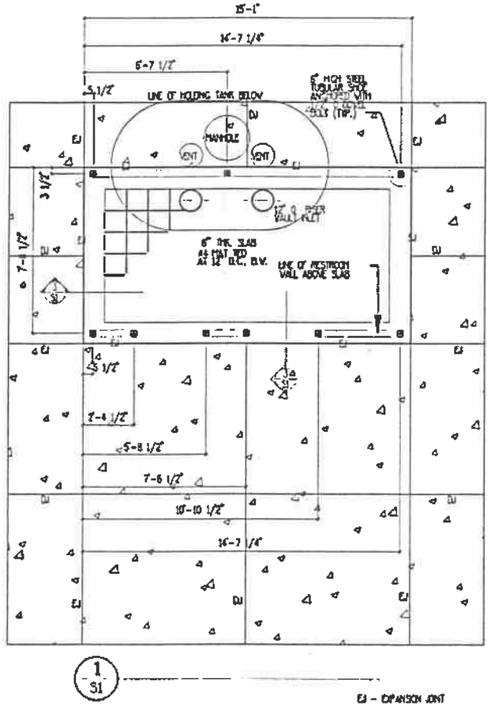


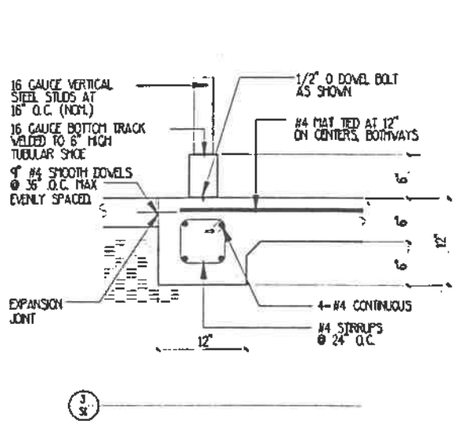
BATHROOM SLAB DETAIL | C

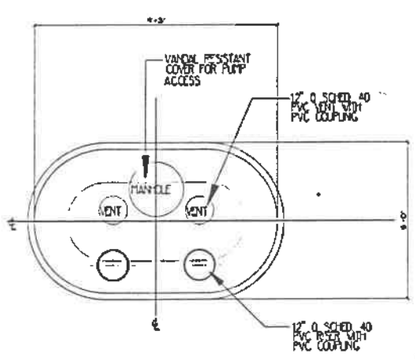
USE REVIEWED	
OCCUPANCY TYPE	B-2
ROOF LIVE LOAD	
BASIC WIND SPEED	
WIND EXPOSURE	
FLOOR LIVE LOAD	
SEISMIC ZONE	
ASSUMED ALLOWABLE SOIL PRESSURE	1,000 P.S.F.

– Concrete –

– Additional Notes –

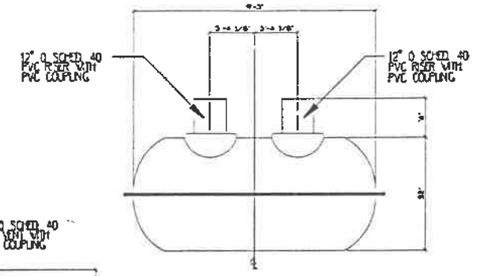


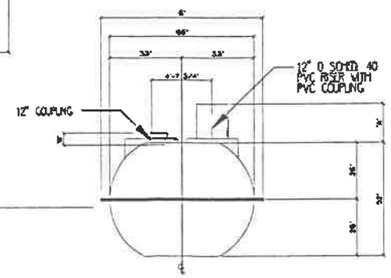




TANK DETAILS

- DIMENSIONS "A" & "B" ARE TO BE DETERMINED BY THE TANK MANUFACTURER.
- MANUFACTURER SHALL ALSO DETERMINE THE SIZES OF RISERS, COUPLINGS AND PUMP ACCESS AND COVERS.
- COUPLINGS ARE TO BE ATTACHED TO TANK BY MANUFACTURER.
- BAFFLE SHALL HAVE 2" AIR SPACE AT BOTTOM.
- SEPTIC TANK TO BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND TESTED PER COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH. INSTALL TANK SAME DAY AS PASSING TEST.





BATHROOM DETAIL | E

Steven Sutherland & Associates Landscape Architects
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Site Planning
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Santa Cruz, CA 95060-2756
(408) 459-0455
Cal Landscape Architect
Lic #2805

NORTH COAST BEACHES
Scott Creek Beach
County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

DRAWING ISSUED		
DATE:	PURPOSE BY	
9-15-95		GWLS
4-12-96	BID	GWLS

SCALE: NOT TO SCALE

SHEET TITLE: CONSTRUCTION DETAILS

SHEET NUMBER: L-4

A I B I C I D I E I F I G I H I I I J I K I L I M I N I O I P

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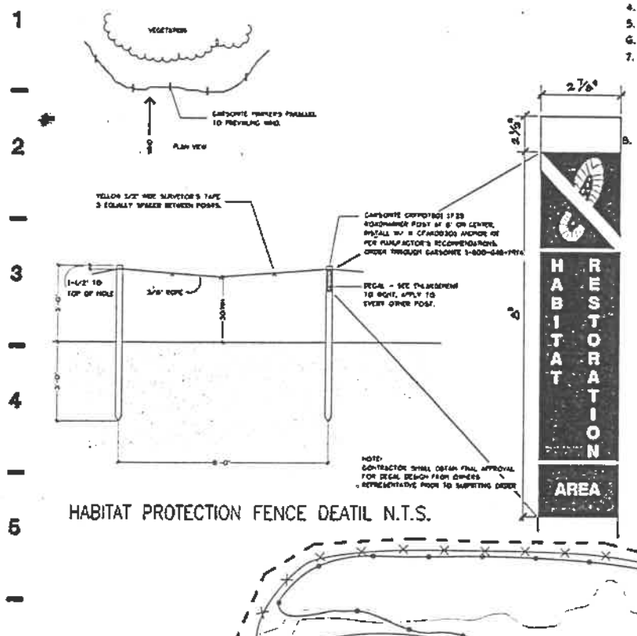
LAYOUT NOTES

1. All dimensions shall be verified in the field and checked, strong lined, or flagged prior to any construction. If any discrepancies occur, Contractor shall redirect construction efforts and immediately notify Owner's Representative of discrepancy.
2. All dimension lines are either perpendicular to or parallel to the element from which it is dimensioned unless noted otherwise.
3. Interface of all proposed improvements to existing site surfaces and improvements shall conform and be smooth and uniform.
4. All subgrades and baserock shall be per project Geotechnical Report.
5. Layout Plan to be used in conjuction with Civil Engineer's Plans, Site Grading Plans Specifications and details.
6. All signage placements are to be verified with Owners Representative before installation.
7. Concrete shall contain integral colorants or Lamp Black as detailed and as specified with a medium broom finish perpendicular to the primary path of travel. The Contractor shall provide a 4'x4' sample of all different colors and finishes of site concrete (using the same materials that will be used in the actual construction) for review and approval by Owner's Representative. Rejected samples shall be re-poured until approved by the Owner's Representative. Samples shall be poured by the Contractor to give ample time for review and potential modification in advance of final concrete pours. Do not apply water to concrete during placement and finishing/curing. Doing so will discolor the final product and incur liability of rejection.
8. All site concrete except post footings in earth are to receive integral colorant as follows: L.M. Scofield Chromix Admixture SC-20 Limestone

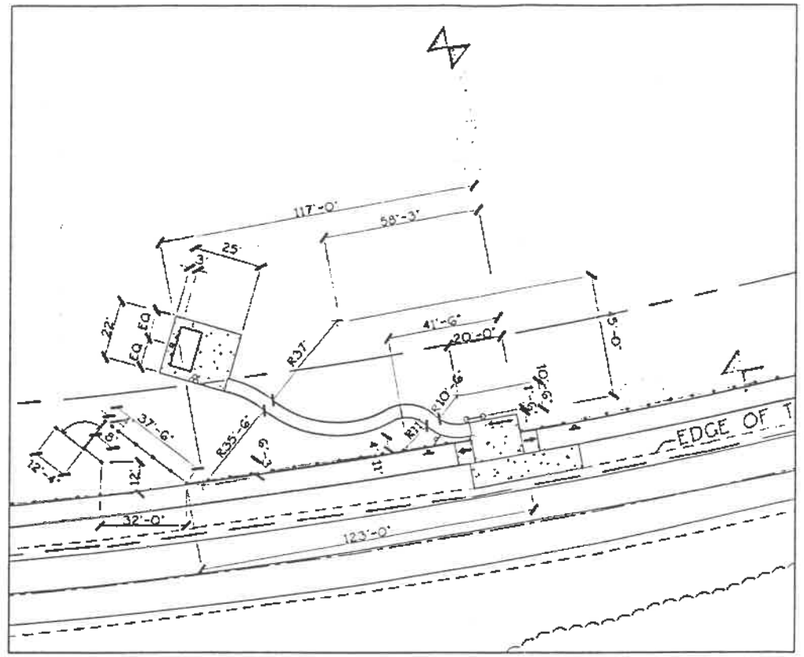
   Post hole footings in earth not in paving, can be natural colored.



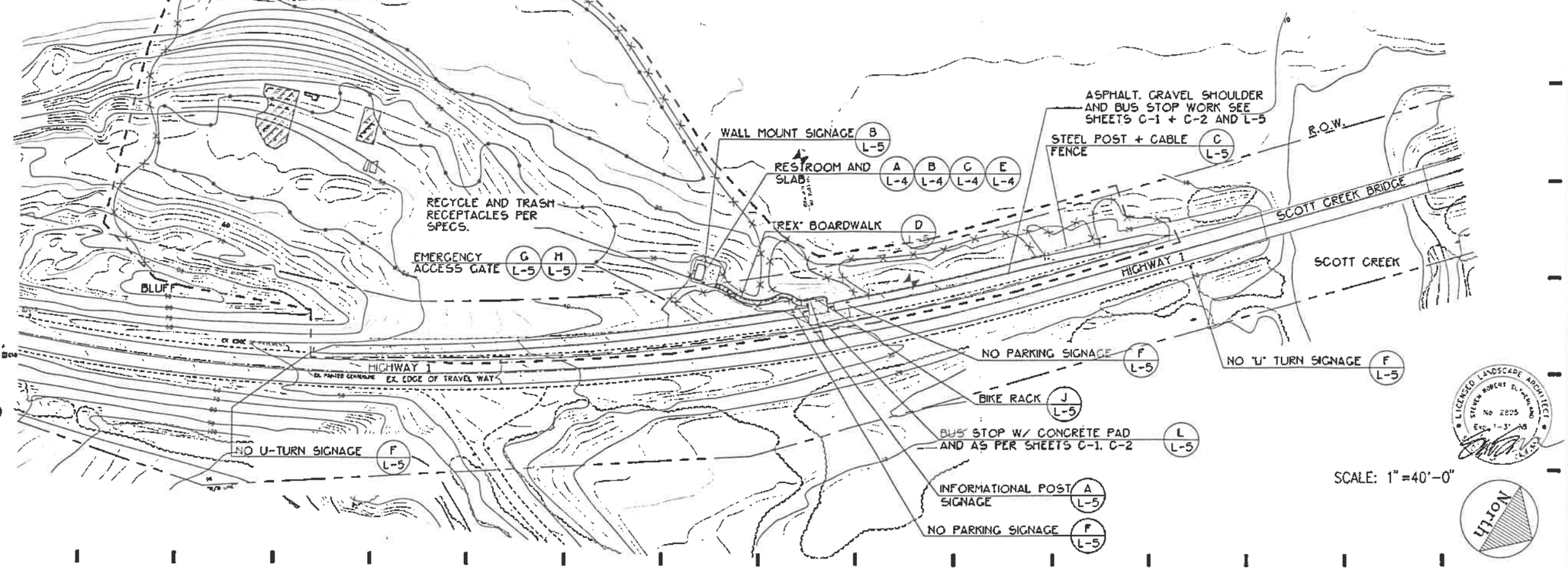
HABITAT PROTECTION FENCE DEATIL N.T.S.

LAYOUT LEGEND

TYP.	TYPICAL
EQ.	EQUAL
R	RADIUS
	LAYOUT BASELINE
	EDGE OF SNOWY PLOVER BREEDING AREA
	STEEL POST AND CABLE FENCE
	HABITAT PROTECTION FENCE
	LIMIT OF WORK



LAYOUT ENLARGEMENT SCALE: 1"=20'-0"



SCALE: 1"=40'-0"

NORTH

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NORTH COAST BEACHES
Scott Creek

County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

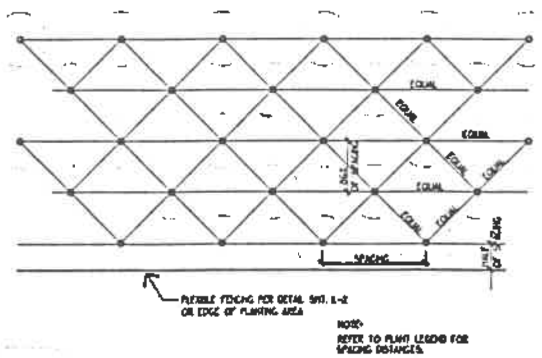
DRAWING ISSUED		
DATE	PURPOSE	BY
5-15-95		CWLS
7-12-95	BID	CWLS

SCALE: VARIES

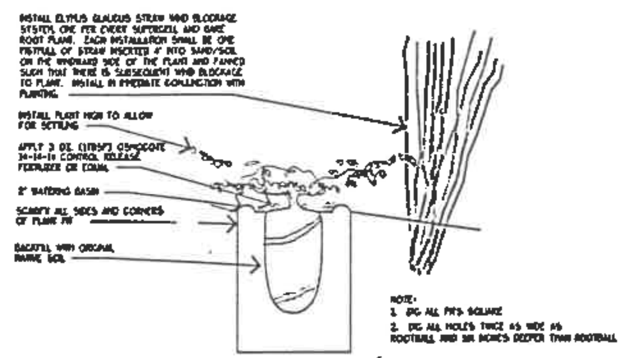
SHEET TITLE: LAYOUT PLAN

SHEET NUMBER: L-2

A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P



PLANT SPACING DETAIL



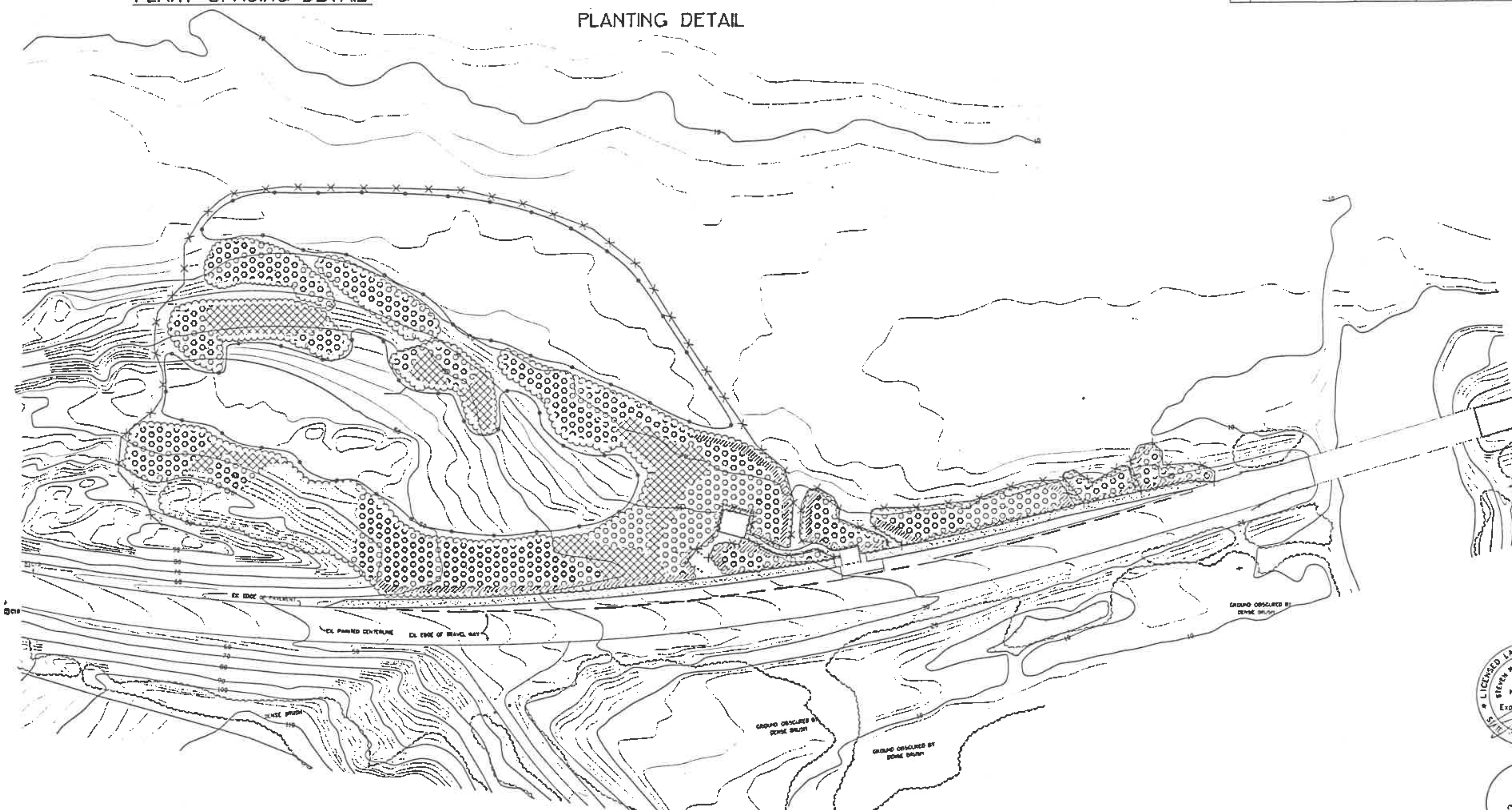
PLANTING DETAIL

PLANTING NOTES

1. Contractor shall water all plants as necessary from a trucked water source.
2. Contractor shall layout plant material as per plan and receive approval from Owner's Representative prior to installation.
3. All newly planted material shall be watered by deep soaking within 3 hours of planting. No plants shall be planted with root balls or new pits in a dry condition.
4. Contractor shall be responsible for maintaining all project plant material until project final acceptance.
5. Contractor shall review and have a thorough understanding of all related drawings and specifications prior to bid.
6. Contractor shall refer to layout plan, planting details and specifications for additional information.

PLANT LEGEND

KEY	SCIENTIFIC NAME	COMMON NAME	SIZE	QTY	Comments
		PLANT MIX			Propagate all plants from Santa Cruz North Coast parent stock. Plant all material 18" on center.
	Ambrosia chamissonis	Beach Bur	Supercells	100%	
	Abronia latifolia	Yellow Sand Verbena	Rosepots	3%	
	Ambrosia chamissonis	Beach Bur	Supercells	5%	
	Camissonia cheiranthifolia	Beach Primrose	Supercells	5%	
	Elymus mollis	Pacific Dune Grass	Supercells	87%	
	Abronia latifolia	Yellow Sand Verbena	Rosepots	25%	
	Ambrosia chamissonis	Beach Bur	Supercells	15%	
	Camissonia cheiranthifolia	Beach Primrose	Supercells	15%	
	Distichlis spicata	Salt Grass	Supercells	10%	
	Elymus mollis	Pacific Dune Grass	Supercells	25%	
	Fragaria chiloensis	Beach Strawberry	Supercells	10%	
	Artemisia pycnocephala	Sandhill Sage	Supercells	10%	
	Baccharis pilularis	Coyote Bush	Supercells	10%	
	Ericameria ericoides	Mock Heather	Supercells	10%	
	Erigeron glaucus	Seaside Daisy	Supercells	10%	
	Eriogonum latifolium	Coast Buckwheat	Supercells	10%	
	Eriophyllum staechadifolium	Golden Yarrow	Supercells	10%	
	Eschscholzia californica var. maritima	California Poppy	Supercells	10%	
	Fragaria chiloensis	Beach Strawberry	Supercells	10%	
	Rhamnus californica	Coffee Berry	Supercells	10%	
	Rubus ursinus	California Blackberry	Supercells	10%	



LICENSED LANDSCAPE ARCHITECT
STEVEN ROBERT SUTHERLAND
No. 2805
Exp. 1-31-98
STATE OF CALIFORNIA

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NORTH COAST BEACHES
Scott Creek Beach

County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

DRAWING ISSUED		
DATE	PURPOSE	BY
5-15-95		CWLS
1-12-96	BID	CWLS

SCALE: 1"=40'-0"

SHEET TITLE: PLANTING PLAN

SHEET NUMBER: L-3

A B C D E F G H I J K L M N O P

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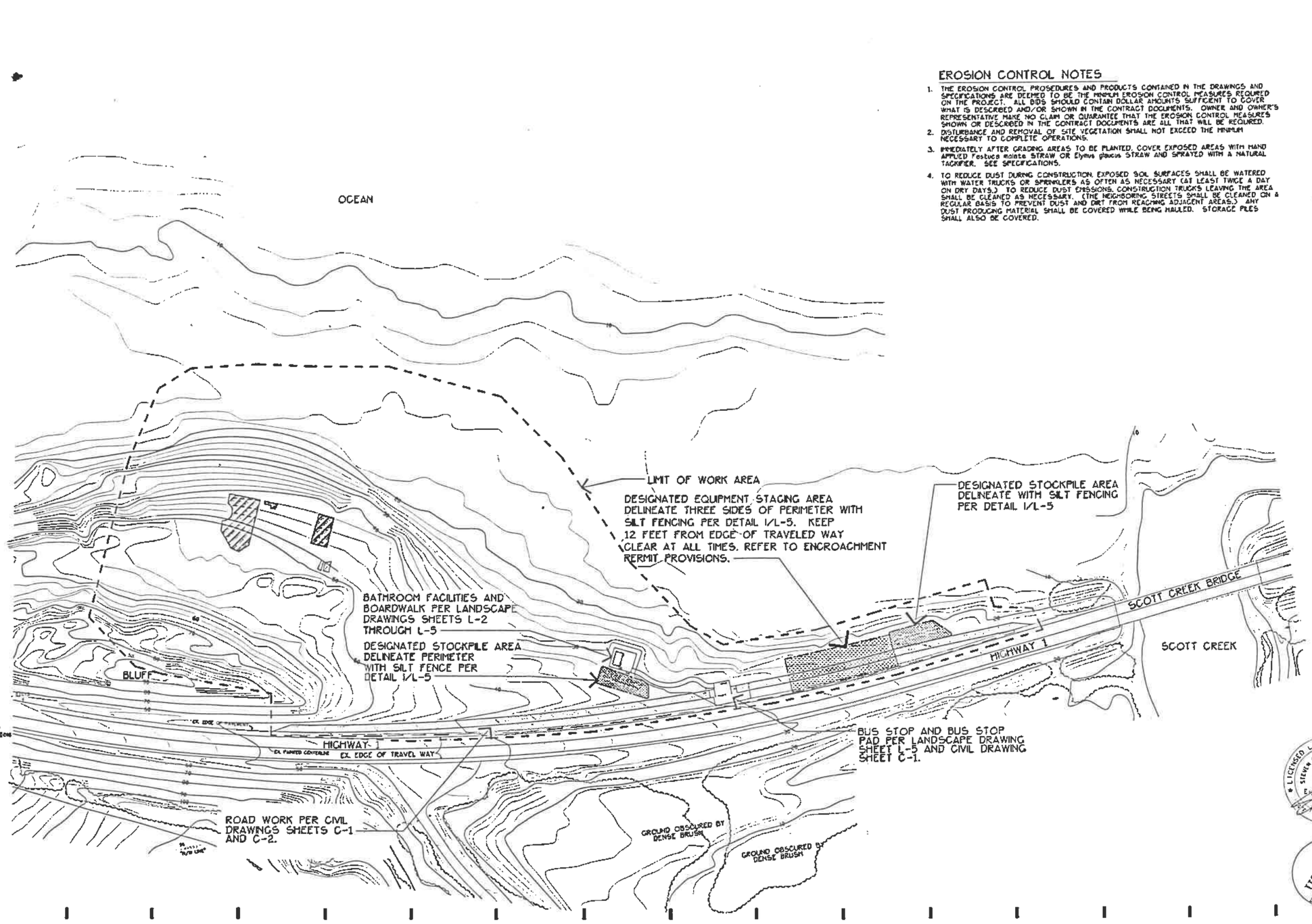

EROSION CONTROL NOTES

1. THE EROSION CONTROL PROSEDURES AND PRODUCTS CONTAINED IN THE DRAWINGS AND SPECIFICATIONS ARE DEEMED TO BE THE MINIMUM EROSION CONTROL MEASURES REQUIRED ON THE PROJECT. ALL BIDS SHOULD CONTAIN DOLLAR AMOUNTS SUFFICIENT TO COVER WHAT IS DESCRIBED AND/OR SHOWN IN THE CONTRACT DOCUMENTS. OWNER AND OWNER'S REPRESENTATIVE MAKE NO CLAIM OR GUARANTEE THAT THE EROSION CONTROL MEASURES SHOWN OR DESCRIBED IN THE CONTRACT DOCUMENTS ARE ALL THAT WILL BE REQUIRED.
2. DISTURBANCE AND REMOVAL OF SITE VEGETATION SHALL NOT EXCEED THE MINIMUM NECESSARY TO COMPLETE OPERATIONS.
3. IMMEDIATELY AFTER GRADING AREAS TO BE PLANTED, COVER EXPOSED AREAS WITH HAND APPLIED Festuca rubra STRAW OR Elymus glaucus STRAW AND SPRAYED WITH A NATURAL TACKIFIER. SEE SPECIFICATIONS.
4. TO REDUCE DUST DURING CONSTRUCTION, EXPOSED SOIL SURFACES SHALL BE WATERED WITH WATER TRUCKS OR SPRINKLERS AS OFTEN AS NECESSARY (AT LEAST TWICE A DAY ON DRY DAYS.) TO REDUCE DUST EMISSIONS, CONSTRUCTION TRUCKS LEAVING THE AREA SHALL BE CLEANED AS NECESSARY. (THE NEIGHBORING STREETS SHALL BE CLEANED ON A REGULAR BASIS TO PREVENT DUST AND DIRT FROM REACHING ADJACENT AREAS.) ANY DUST PRODUCING MATERIAL SHALL BE COVERED WHILE BEING HAULED. STORAGE PILES SHALL ALSO BE COVERED.

NORTH

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Lic #2805

NORTH COAST BEACHES
Scott Creek
County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

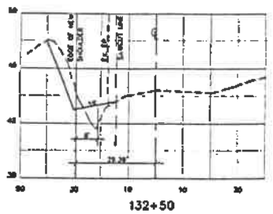
DRAWING ISSUED		
DATE	PURPOSE	BY
5-15-95		CWLS
7-12-96	BID	CWLS

SCALE: 1"=40'-0"

SHEET TITLE: EROSION CONTROL PLAN

SHEET NUMBER: L-1

LICENSED LANDSCAPE ARCHITECT STEVEN ROBERT SUTHERLAND No 2805 Exp. 1-31-98 OF CALIFORNIA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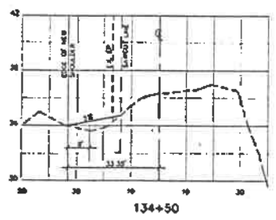
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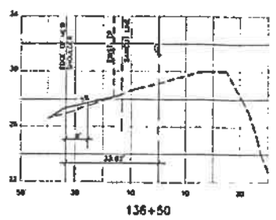
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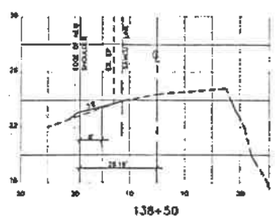
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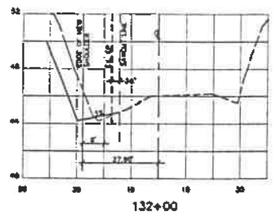
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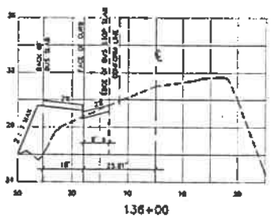
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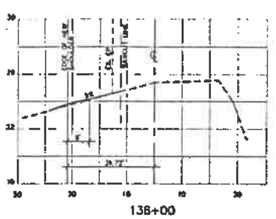
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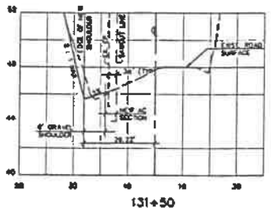
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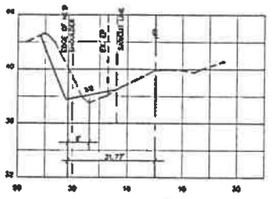
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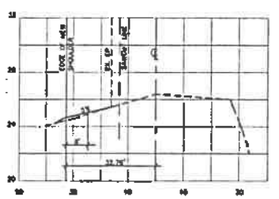
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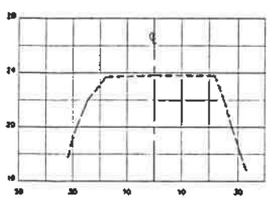
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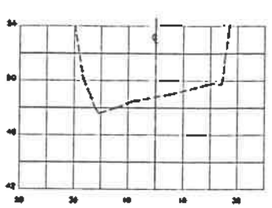
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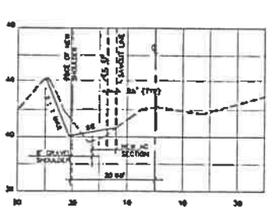
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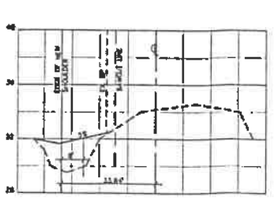
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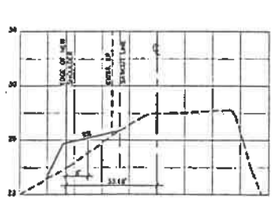
SCALE 1" = 20' H
1" = 4' V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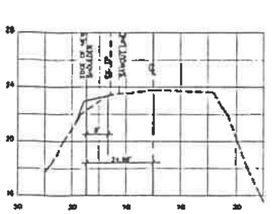
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BOWMAN & WILLIAMS CONSULTING CIVIL ENGINEERS 1011 CEDAR STREET SANTA CRUZ, CA 95060 (408) 426-3560 REGISTERED CIVIL ENGINEER NO.			NORTH COAST BEACHES SCOTT CREEK CROSS SECTIONS		
SCALE: AS SHOWN	DRAWN: DMB		JOB NO.: 20263	SHEET C-2	
DATE: JANUARY 1996	CHECKED: TMB		INDEX		
DESIGN: TMB	ACAD NO.: 20263-2		FILE NO.: 20263	OF 3	

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Cal Landscape Architect
Lic #2905

NORTH COAST BEACHES PHASE ONE
Scott Creek Beaches
County of Santa Cruz Dept. of Parks, Open Spaces & Cultural Services

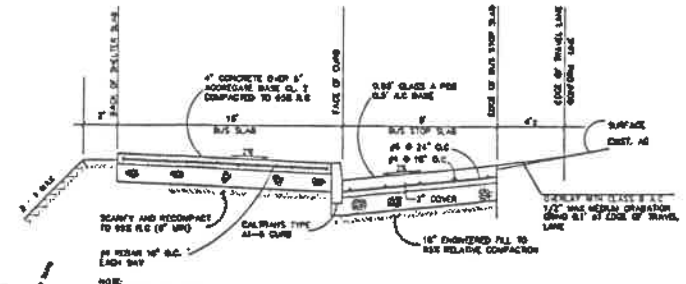
DRAWING ISSUED		
DATE	PURPOSE	BY
5-15-96		SSA
8-12-96	bid	TMB

SCALE: AS SHOWN

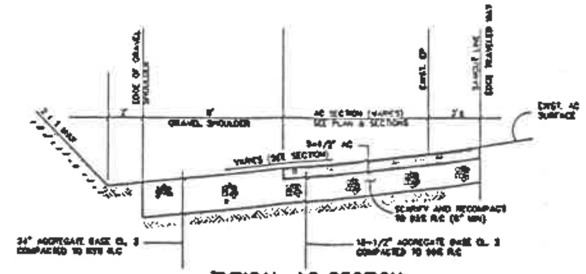
SHEET TITLE: HWY. 1 Cross Sections

SHEET NUMBER: C-2

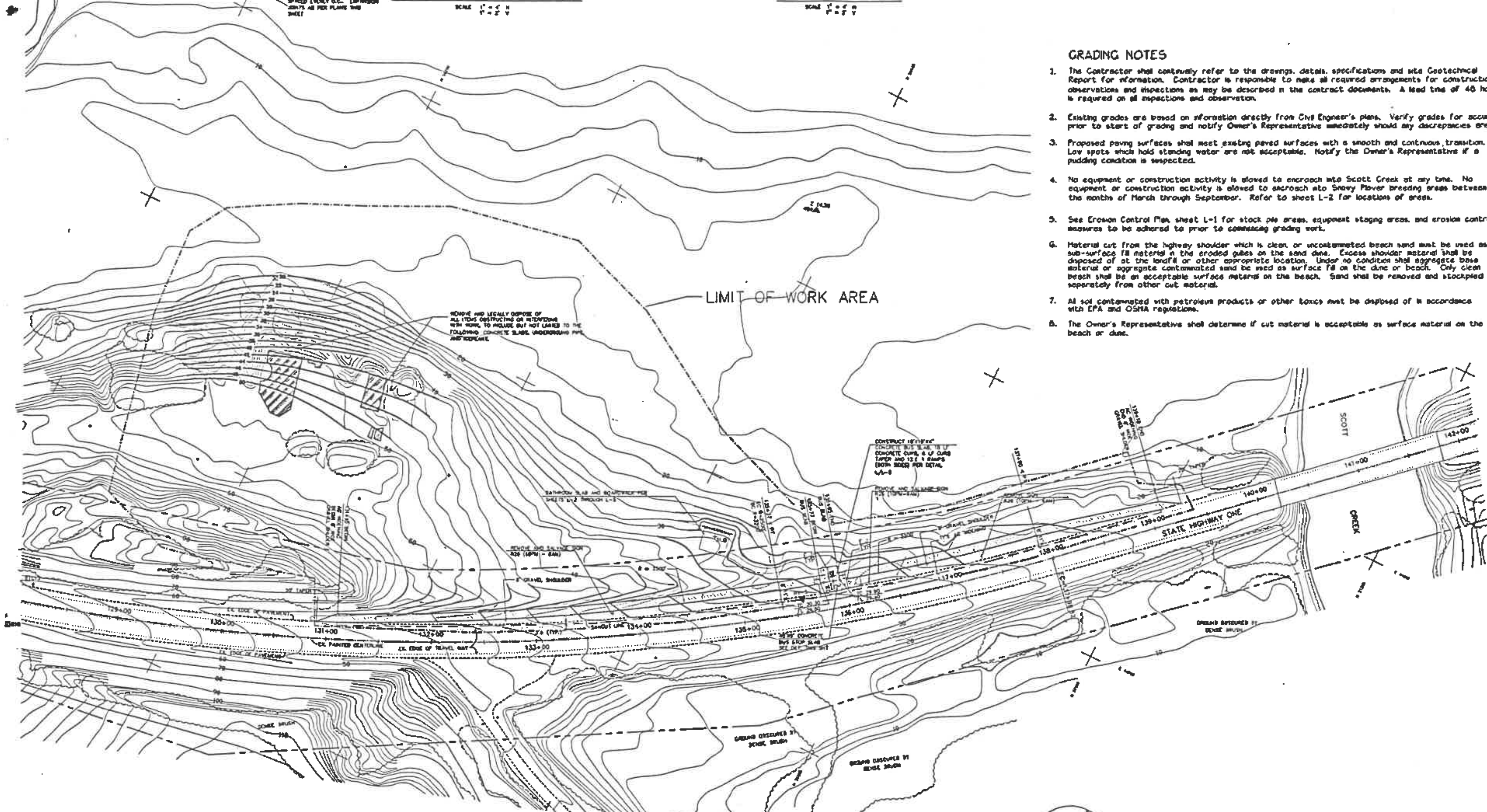
A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P



TYPICAL SECTION AT BUS STOP



TYPICAL AC SECTION



PLAN

GRADING NOTES

1. The Contractor shall continually refer to the drawings, details, specifications and site Geotechnical Report for information. Contractor is responsible to make all required arrangements for construction observations and inspections as may be described in the contract documents. A lead time of 48 hours is required on all inspections and observation.
2. Existing grades are based on information directly from Civil Engineer's plans. Verify grades for accuracy prior to start of grading and notify Owner's Representative immediately should any discrepancies arise.
3. Proposed paving surfaces shall meet existing paved surfaces with a smooth and continuous transition. Low spots which hold standing water are not acceptable. Notify the Owner's Representative if a puddling condition is suspected.
4. No equipment or construction activity is allowed to encroach into Scott Creek at any time. No equipment or construction activity is allowed to encroach into Snowy Plover breeding areas between the months of March through September. Refer to sheet L-2 for locations of areas.
5. See Erosion Control Plan sheet L-1 for stock pile areas, equipment staging areas, and erosion control measures to be adhered to prior to commencing grading work.
6. Material cut from the highway shoulder which is clean, or uncontaminated beach sand must be used as sub-surface fill material in the eroded gulies on the sand dune. Excess shoulder material shall be disposed of at the landfill or other appropriate location. Under no condition shall aggregate base material or aggregate contaminated sand be used as surface fill on the dune or beach. Only clean beach shall be an acceptable surface material on the beach. Sand shall be removed and stockpiled separately from other cut material.
7. All soil contaminated with petroleum products or other toxics must be disposed of in accordance with EPA and OSHA regulations.
8. The Owner's Representative shall determine if cut material is acceptable as surface material on the beach or dune.

CONSTRUCTION AREA SIGNS

SIGN	CODE	PANEL SIZE	NO. OF POSTS	EACH
1	C13	48" x 18"	1 - 4" x 4"	2
2	C16	48" x 48"	1 - 4" x 6"	2

SIGN NOTES

1. EXACT LOCATION AND POSITION OF CONSTRUCTION AREA SIGNS TO BE DETERMINED BY THE CIVIL ENGINEER.
2. CONSTRUCTION AREA SIGNS ARE STATIONARY MOUNTED.

NOT FOR BIDDING PURPOSES

BOWMAN & WILLIAMS
CONSULTING CIVIL ENGINEERS
1011 CEDAR STREET
SANTA CRUZ, CA. 95060
(408) 426-3560

NORTH COAST BEACHES
SCOTT CREEK BEACH
BUS TURNOUT AND GRADING PLAN

SCALE AS SHOWN	DRAWN BWI	JOB No. 20263	SHEET C-1
DATE JANUARY 1996	CHECKED WIL	INDEX	OF
DESIGN TAB	ACAD No. 20263-3	FILE No. 20263	

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(408) 459-0455
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NORTH COAST BEACHES
Scott Creek Beach
County of Santa Cruz Dept. of Parks, Open Space & Cultural Services

DRAWING ISSUED

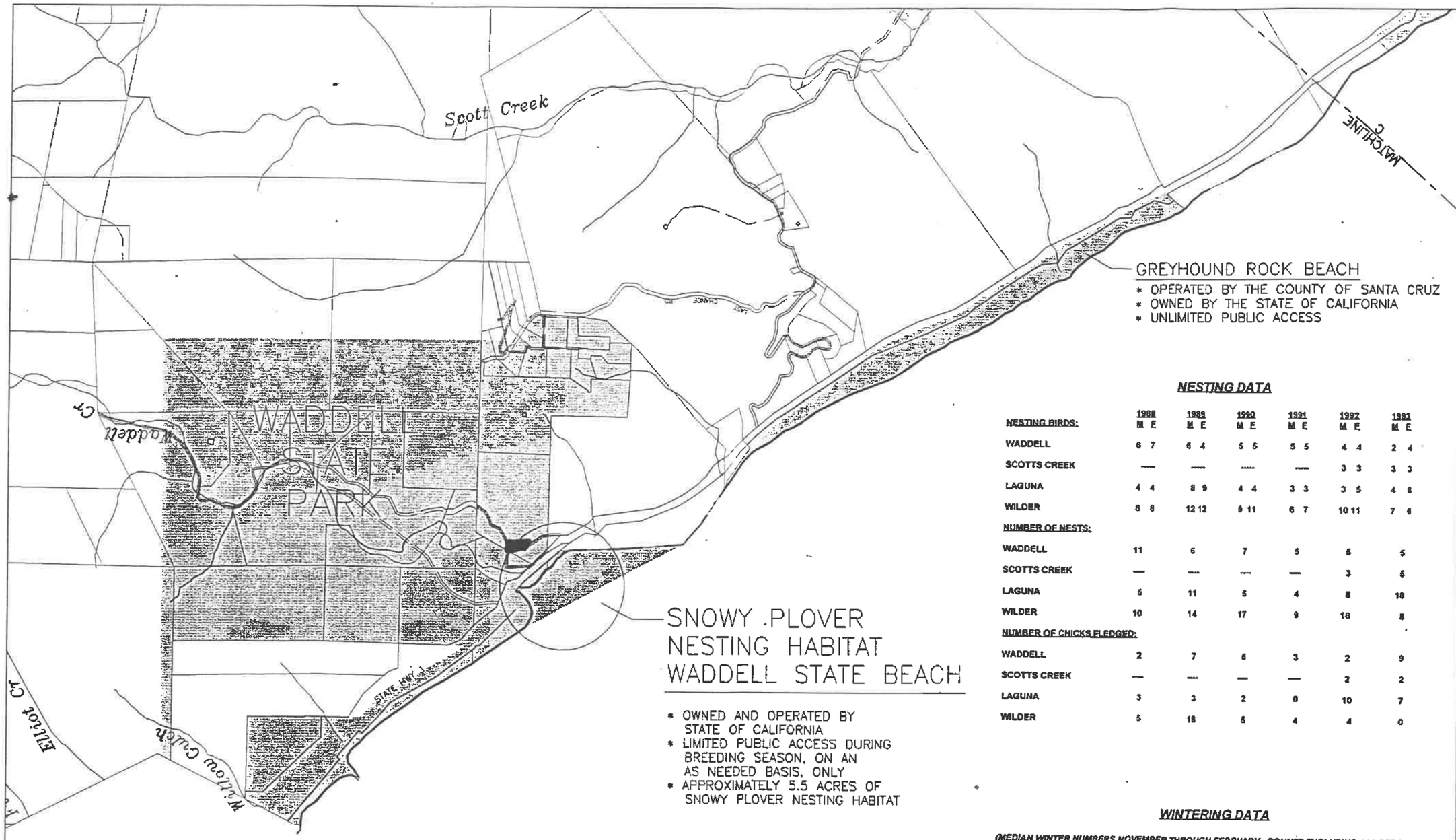
DATE	PURPOSE	BY
5-15-95		
1-12-96	Bid	ATL

SCALE: 1"=40'-0"

SHEET TITLE: BUS TURNOUT AND GRADING PLAN

SHEET NUMBER: C-1

APPENDIX C



NESTING DATA

NESTING BIRDS:	1988 M	1988 E	1989 M	1989 E	1990 M	1990 E	1991 M	1991 E	1992 M	1992 E	1993 M	1993 E
WADDELL	6	7	6	4	5	5	5	5	4	4	2	4
SCOTTS CREEK	—		—		—		—		3	3	3	3
LAGUNA	4	4	8	9	4	4	3	3	3	5	4	6
WILDER	8	8	12	12	9	11	6	7	10	11	7	6
NUMBER OF NESTS:												
WADDELL	11		6		7		5		5		5	
SCOTTS CREEK	—		—		—		—		3		5	
LAGUNA	5		11		5		4		8		10	
WILDER	10		14		17		9		16		8	
NUMBER OF CHICKS FLEDGED:												
WADDELL	2		7		6		3		2		9	
SCOTTS CREEK	—		—		—		—		2		2	
LAGUNA	3		3		2		0		10		7	
WILDER	5		18		5		4		4		0	

WINTERING DATA

(MEDIAN WINTER NUMBERS NOVEMBER THROUGH FEBRUARY. COUNTS EXCLUDING ALL ZERO COUNTS, UNLESS ZERO BIRDS ON ALL COUNTS.)

	1987	1988	1989	1990	1991	1992-93
WADDELL	37	17	3	36	15	11
SCOTTS CREEK	8	7	37	33	93	71
LAGUNA CREEK	11	16	28	34	23	22
BALDWIN CREEK	7	-0-	-0-	-0-	-0-	—
WILDER CREEK	29	21	38	36	18	40

NORTH COAST BEACHES
SANTA CRUZ COUNTY, CALIFORNIA

DRAWING PREPARED BY

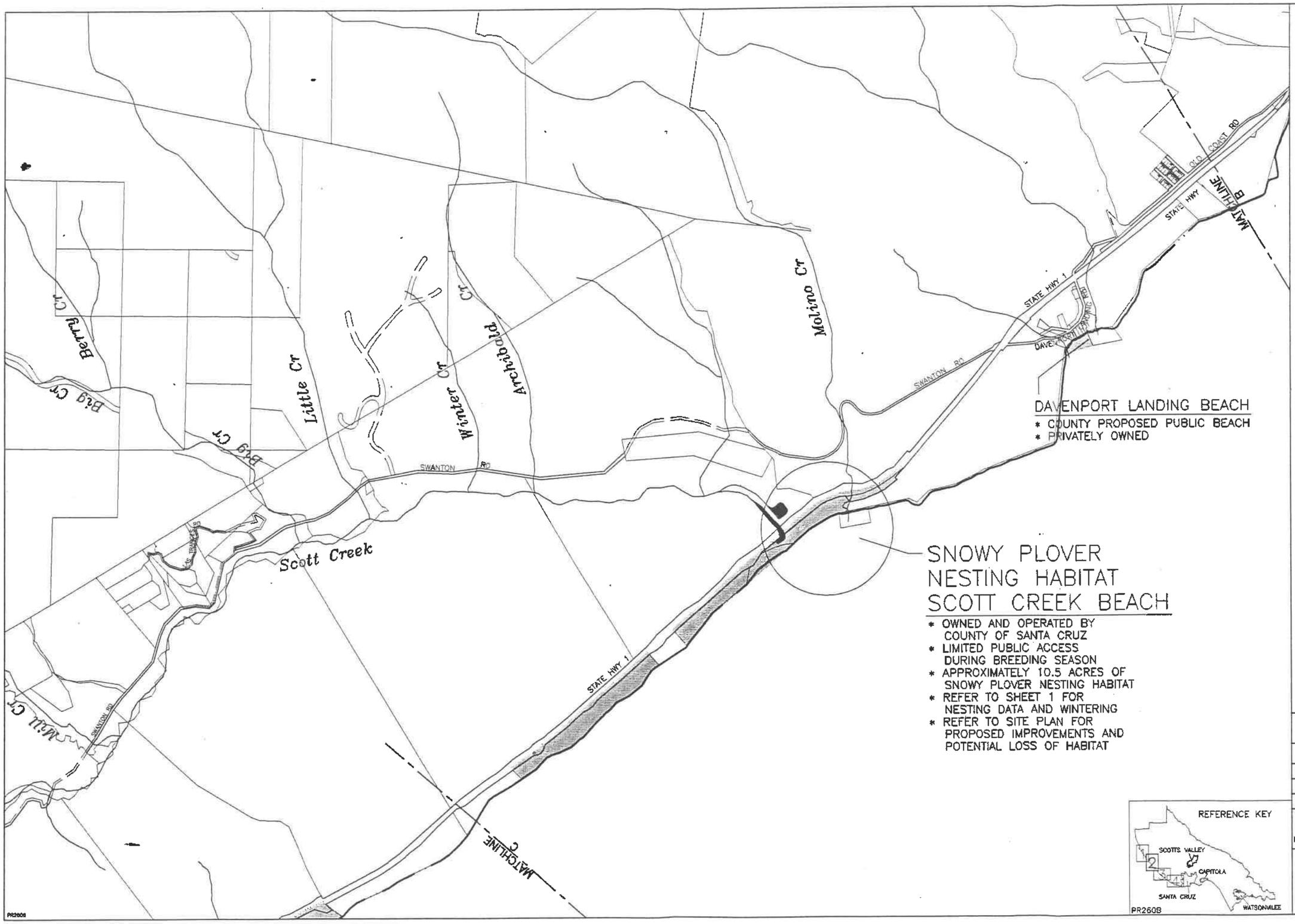
DRAWING REVIEWED BY

SCALE
NOT TO SCALE

APPENDIX C

NORTH COAST BEACHES

SANTA CRUZ COUNTY, CALIFORNIA



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APPENDIX C

NORTH COAST BEACHES
SANTA CRUZ COUNTY, CALIFORNIA

DAVENPORT BEACH AND BLUFFS
* COUNTY PROPOSED PUBLIC OPEN SPACE
* PRIVATELY OWNED

PANTHER BEACH
* COUNTY PROPOSED PUBLIC BEACH
* PRIVATELY OWNED

BONNY DOON BEACH
* COUNTY PROPOSED PUBLIC BEACH
* PRIVATELY OWNED

YELLOW BANKS BEACH
* COUNTY PROPOSED PUBLIC BEACH
* PRIVATELY OWNED

SNOWY PLOVER NESTING HABITAT
LAGUNA CREEK BEACH
* COUNTY PROPOSED NATURAL RESOURCE PRESERVE
* PRIVATELY OWNED
* COUNTY OPERATED SNOWY PLOVER RESOURCE PROTECTION
* LIMITED PUBLIC ACCESS DURING BREEDING SEASON
* APPROXIMATELY 4 ACRES OF SNOWY PLOVER NESTING HABITAT
* REFER TO SHEET 1 of 4 FOR NESTING DATA

REFERENCE KEY

DRAWING PREPARED BY

DRAWING REVIEWED BY

DATE

SCALE
NOT TO SCALE

3 of 4

R260C

APPENDIX C

NORTH COAST BEACHES
SANTA CRUZ COUNTY, CALIFORNIA

WILDER RANCH
STATE PARK

Baldwin Cr
Majors Cr
MATCHLINE A
STATE
HWY 1
DIMEO LN
Sandy Flat Gulch
Old Dairy Gulch
Peasely Gulch
Wilder Cr
Cave Gulch
EMPIRE GRADE
HIGHVIEW CT
Moore Cr
STATE HWY 1
COAST RD
CITY OF SANTA CRUZ

FOUR MILE BEACH
or
BALDWIN CREEK BEACH

* OWNED AND OPERATED BY THE STATE OF CALIFORNIA
* UNLIMITED PUBLIC ACCESS
* REFER TO SHEET 1 of 4 FOR WINTERING DATA

SNOWY PLOVER
STATE PRESERVE
WILDER STATE BEACH

* OWNED AND OPERATED BY THE STATE OF CALIFORNIA
* NO PUBLIC ACCESS
* APPROXIMATELY 3 ACRES OF SNOWY PLOVER NESTING HABITAT
* REFER TO SHEET 1 of 4 FOR WINTERING DATA

REFERENCE KEY
SCOTTS VALLEY
CAPITOLA
SANTA CRUZ
WATSONVILLE

PR2600

DRAWING PREPARED BY

DRAWING REVIEWED BY

DATE

SCALE
NOT TO SCALE
N

APPENDIX D

NESTING SUCCESS OF SNOWY PLOVERS AT SCOTT CREEK BEACH, SANTA CRUZ COUNTY, CALIFORNIA IN 1995

Douglas E. George

Report of:

PRBO
4990 Shoreline Highway
Stinson Beach, California 94970

September 1995

INTRODUCTION

Continuing degradation and loss of coastal beach breeding habitat due to development and recreational use, and a declining population size of Snowy Plovers have been of increasing concern. In March 1993 the Pacific coast population of the Western Snowy Plover was listed as threatened by the U.S. Fish and Wildlife Service.

Located in northern Santa Cruz Co., Scott Creek Beach is historically known to have supported nesting Snowy Plovers as evidenced by egg sets in museum collections obtained from Scott Creek Beach during the years 1878-1946 (Page and Stenzel 1981). At present this beach, which is owned and managed by Santa Cruz Co., receives heavy recreational use by the public with the period of highest use coinciding with the Snowy Plover breeding season. The resulting degradation of habitat and disturbance to adult birds, nests, and young poses significant threats to the breeding success of Snowy Plovers.

Snowy Plover breeding success at Scott Creek Beach has been monitored since 1993. (In 1992, while not followed as closely, there is evidence for 3 breeding pairs, a minimum of 3 nests, and 2 chicks fledging.) In 1993 an initial effort was made by the Santa Cruz County Office of Parks, Open Space and Cultural Services (POSCS) to protect some nests with exclosures. (Exclosures consisted of 5 ft. high, 2 x4 in. mesh wire fencing placed in a 75 ft. perimeter triangle around an individual nest. The sides were buried approximately 8 inches in the sand.) Of the total number of 5 nests at Scott Creek Beach in 1993, 3 were unprotected and all failed due to desertion. Of the 2 exclosure-protected nests, 1 hatched and 1 failed due to desertion (Tables 1 and 2). All nesting sites and incubating birds were subject to substantial levels of human disturbance which was likely an important factor in the very high rate of 4 of 5 nests (80%) being deserted. Some nests appeared to have been abandoned when disturbed birds were unable to incubate and the exposed eggs were scattered by wind or buried by blowing sand.

During 1994, in addition to the use of exclosures where suitable, symbolic fencing was placed by POSCS around a portion of breeding habitat where 3 of 5 nests were located in 1993. This symbolic fence was composed of a single strand of cable strung between metal stakes. The purpose of this symbolic fence was to provide an area of reduced human disturbance on the beach for potential nesting and as a possible area for adults with precocial chicks to find temporary refuge during periods of high public use. In 1994 there was a total of 3 nests, all located within the area protected by the symbolic fence. One exclosure-protected nest hatched and 1 of 2 nests without exclosures hatched (Table 1). The overall hatch rate in 1994 (67%) was 3.4 times the rate in 1993 (20%) (Table 1).

During 1995 the symbolic fencing put in place in 1994 was retained and exclosures continued to be used where suitable. Monitoring of Snowy Plover breeding success at Scott Creek Beach in 1995 was carried out by Doug George and Ed Jameyson.

RESULTS

Clutch Hatching Success

In 1995 there was a total of six nests. Five nests were located within the area protected by the symbolic fence and 1 was located immediately east of this fence and near Hwy 1. Three nests (including the nest outside of the symbolic fence and near Hwy 1) were protected with exclosures and all hatched (Table 1).

Three nests were not provided with exclosures: two due to unsuitability of terrain and one due to early failure from unknown causes. Of the 3 nests without exclosures, 1 hatched, 1 failed due to unknown causes, and 1 was deserted (eggs found displaced from nest) (Tables 1 and 2).

The overall hatch rate for 1995 was 67% (4 of 6 nests hatching). This compares with an overall hatch rate of 20% (1 of 5) and 67% (2 of 3) in 1993 and 1994, respectively (Table 1).

Chick Fledging Rate

In 1995, 6 of 8 chicks from exclosure-protected nests fledged and both chicks from 1 unexclosed nest fledged, for an overall fledge rate of 80% (8 of 10 chicks fledging) (Table 1). Chick fledging rates were 67% (2 of 3 chicks) in 1993 and 75% (3 of 4 chicks) in 1994. (Table 1).

Chicks Fledged per Egg

The number of chicks fledged per egg is a good measure of overall breeding success. In 1995 chicks fledged at a rate of 0.44 per egg (Table 1). This compares with rates of 0.14 in 1993 and 0.33 in 1994 (Table 1).

Success of Protective Measures

In 1993 protective measures were limited to placing exclosures around some nests. Of the total of 5 nests, 3 did not have exclosures: all were deserted. Two nests were protected by exclosures: 1 hatched and 1 was deserted. The overall clutch hatch rate was only 20%. All of the nesting sites and incubating birds were subject to repeated human disturbance which was an apparent factor in the very high nest desertion rate (80%) and depressed breeding success.

In 1994 protective measure were expanded to include a symbolic fence protecting a portion of breeding habitat as well as the use of exclosures where suitable. There was a total of 3 nests, all located within the

area protected by a symbolic fence. One exclosure-protected nest hatched and 1 of 2 nests without exclosures hatched.

The protective measures of the symbolic fence and use of exclosures were continued in 1995 when there was a total of 6 nests. Five nests were within the symbolic fence and 2 of these were exclosed. One nest was outside the symbolic fence and was also exclosed. All three exclosure-protected nests hatched and 1 of 3 nests without exclosures hatched. In 1995, as in 1994, the overall hatch rate was 67%, 3.4 times the rate in 1993 (20%). The number of chicks fledged per egg in 1995 (0.44) was 3.1 times the rate in 1993 (0.14) and 1.3 times the rate in 1994 (0.33).

Snowy Plover Breeding Success in Santa Cruz Co. in 1995

In 1995 nesting of Snowy Plovers in Santa Cruz Co. was restricted to 6 sites: Sunset Beach in the south county and 5 small pocket beaches in the north county. Clutch hatching rates ranged from 0%-100% and chick fledging rates ranged from 0%-80% (Table 3). For the 6 breeding sites in Santa Cruz Co. the average rate for clutch hatching was 50% and the rate for chick fledging was 51%.

DISCUSSION

Scott Creek Beach is one of only a limited number of Snowy Plover nesting sites remaining in Santa Cruz Co. In 1995 breeding occurred at only 6 sites: Sunset Beach in the south and 5 small pocket beaches along the north coast. In addition, the total breeding population is low with only an estimated 19 breeding pairs in the county in 1995. In response to habitat degradation and disturbance resulting from high public use, protective measures consisting of exclosures around some nests and a symbolic fence around a portion of breeding habitat were used at Scott Creek Beach in 1995. There were 4 breeding pairs and a total of 6 nests. All but 1 nest (which was exclosed) were within the symbolic fenced area. The clutch hatching rate was 67% and the chick fledging rate was 80%. This compares with an average clutch hatching rate of 47% and chick fledging rate of 44% for the 5 other Santa Cruz Co. breeding sites in 1995. A total number of 17 chicks fledged in Santa Cruz Co. in 1995 with Scott Creek Beach providing 47% (8 of 17) of this total.

Continuing success of Snowy Plovers at Scott Creek Beach will depend on the preservation and the protection from human disturbance of sufficient areas appropriate for nesting and raising young. It is important that functional breeding habitat for multiple pairs in the dune area of Scott Creek Beach not be lost. During 1993-1995, 93% of the nests (13 of 14) on Scott Creek Beach were located in the dune area. In 1995 broods were also periodically seen in this area.

Unleashed dogs brought onto the beach by people also present a disturbance and risk for adults, nests, and flightless young. Appropriate signing and enforcement of the existing pet leash regulations for county beaches would be beneficial.

In addition to breeding birds, Scott Creek Beach is also an important wintering site for Snowy Plovers. In recent years the wintering flock present on this beach has, at times, been in excess of 100 birds. Roosting birds in winter have also been present in the dune area. Scott Creek Beach is included in the sites the U.S. Fish and Wildlife Service has proposed as critical habitat for both breeding and wintering Western Snowy Plovers (U.S. Fish and Wildlife Service 1995).

References

Page, G.W., and Stenzel, L.E., eds. 1981. The breeding status of the Snowy Plover in California. Western Birds 12:1-40.

U.S. Fish and Wildlife Service. 1995. Proposed designation of critical habitat for the Pacific coast population of the Western Snowy Plover. Federal Register 60:11768-11809.

Table 1. Breeding Success of Snowy Plovers at Scott Creek Beach 1993 to 1995

Rows of numbers without asterisks were unprotected nests.
Rows of numbers marked with an asterisk were nests protected with exclosures.
Rows with 2 asterisks were nests protected with exclosures and unprotected nests combined.

	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
1993	3	8	0.0	0	0.0	0	—	0	0.00
1993*	2	6	50.0	1	50.0	3	66.7	2	0.33
1993**	5	14	20.0	1	21.4	3	66.7	2	0.14
1994	2	6	50.0	1	33.3	2	50.0	1	0.17
1994*	1	3	100.0	1	66.7	2	100.0	2	0.67
1994**	3	9	66.7	2	44.4	4	75.0	3	0.33
1995	3	9 [1]	33.3	1	22.2	2	100.0	2	0.22
1995*	3	9	100.0	3	88.9	8	75.0	6	0.67
1995**	6	18	66.7	4	55.6	10	80.0	8	0.44

1. Assumes 3 eggs for 1 nest that failed early.

Table 2. Causes of Snowy Plover Nest Loss at Scott Creek Beach 1993 to 1995
Rows of numbers without asterisks were unprotected nests.
Rows of numbers marked with an asterisk were nests protected with exclosures.

Year	Deserted	Unknown
1993	3	
1993*	1	
1994	1	
1995	1	1

Table 3. Breeding Success of Snowy Plovers in Santa Cruz Co. in 1995

	Number of Nests	Percent Nests Hatching	Number Nests Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged
Sunset	5	60	3	8	75	6
Wilder	13	0	0	0	—	0
Three Mile[1]	1	100	1	3	67	2
Laguna	5	40	2	6	0	0
Scott Creek	6	67	4	10	80	8
Waddell	3	33	1	3 [2]	33 [2]	1

1. Located in Wilder Ranch State Park and approximately 2 miles from Wilder Beach, Three Mile is a very small pocket beach open to public use. The one breeding pair at Three Mile were birds that earlier in the season had repeated nest failures at Wilder Beach. This is the first known nest at Three Mile and because of its very small size and public use it is unlikely to support significant breeding.

2. Assumes 3 chicks hatching from the 1 successful nest (only 1 chick fledged).

APPENDIX D

NESTING OF SNOWY PLOVERS AT LAGUNA CREEK BEACH, SANTA CRUZ COUNTY, CALIFORNIA IN 1994

Douglas E. George

Report of:

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Stinson Beach, California 94970

September 1994

Introduction

Laguna Creek Beach, in northern Santa Cruz Co., receives substantial use by the public. Over a four-year period 1988-1991 overall reproductive success of Snowy Plovers was low primarily because of low clutch hatching rates. Nests inadvertently destroyed by people were a significant cause of nest loss. Initial efforts to protect plover nests at Laguna Creek Beach began in 1992 and continued in 1993, when individual fenced exclosures with tops were placed around a number of the nests to provide protection from predators as well as from people stepping on eggs. During the pre-protection period, from 1988-1991, 5 of 25 nests hatched (20.0%). In 1992, 4 of 5 (80%) exclosure-protected nests hatched and in 1993, 5 of 7 (71.4%) exclosure-protected nests hatched (Table 3). Exclosures provided significant protection for eggs from predators and prevented eggs from being stepped on by people. However, people approaching nesting sites too closely resulted in incubating adults being repeated disturbed and flushed from nests, leaving exposed eggs vulnerable (e.g., overheating by sun, eggs scattered by wind, or buried by wind-blown sand). Within hours of hatch chicks are permanently led away from the nest by the parent birds. Thus, exclosures provide no protection for chicks during the month-long period until fledging (first capable of flight). The chick fledging rate for 1993 slipped to 53.8% as compared to 83.3% in 1992 and 61.5% for the period 1988-1991 (Table 5).

In 1994, in addition to protecting nests with exclosures, a symbolic fence composed of a single strand of cable strung between metal stakes was positioned around a portion of the nesting habitat. Purpose of the symbolic fence was to reduce human disturbance around some of the nests (4 of 5 hatching nests) and to provide an area of the beach where adults with chicks could find temporary refuge during periods of high public use.

Providing protective measures for the Snowy Plover nesting population at Laguna Creek Beach during 1992-1994 was a natural resource protection project of the Santa Cruz County Office of Parks, Open Space and Cultural Services and made possible through a grant from the California State Coastal Conservancy.

Clutch Hatching Success

In 1994 there was a total of 8 nests. 3 nests were unprotected and none of these hatched (all were destroyed before exclosures could be erected). 5 nests were protected with exclosures and all 5 hatched for a clutch hatching rate of 100% for protected nests (Table 1). This compares with clutch hatching rates for protected nests of 80% (4 of 5) in 1992 and 71.4% (5 of 7) in 1993. During the four-year pre-protection period 1988-1991 clutch hatching success ranged from 18.2% to 25.0% and averaged 20.8% (Table 3).

Chick Fledging Rate

The fledging rate of chicks from protected nests in 1994 was 100% (12 of 12 chicks) (Table 1). This compares with rates for protected nests of 83.3% (10 of 12 chicks) in 1992 and 53.8% (7 of 13 chicks) in 1993. During the period 1988-1991 chick fledging rate was 61.5% (8 of 13 chicks) (Table 5).

Chicks Fledged per Egg

The number of chicks fledged per egg is a good measure of overall breeding success. In 1994 there were 0.80 fledglings per egg in protected nests (Table 1). This compares with rates from protected nests of 0.67 and 0.33, in 1992 and 1993, respectively. Rates for the pre-protection years, 1988-1991, ranged from 0.00 to 0.30 and averaged 0.13 chicks fledged per egg (Table 3).

Success of Protective Measures

During 1994 protective measures included exclosures around individual nests to protect eggs and symbolic fencing to provide an area of reduced human disturbance for nesting birds and broods.

In 1994, 5 nests were protected and all 5 hatched for a hatching rate of 100% (Table 1). This compares with rates of 80.0% and 71.4% for protected nests in 1992 and 1993, respectively. During the pre-protection period 1988-1991 the clutch hatching rate for unprotected nests was 20% (5 of 25) (Tables 3 and 5).

The fledge rate for chicks from protected nests was 100% in 1994. This compares with rates of 83.3% in 1992 and 53.8% in 1993. For the pre-protection period 1988-1991 the fledge rate was 61.5% (Table 5).

The number of chicks fledged per egg in protected nests in 1994 (0.80) was 1.2 times the rate for protected nests in 1992 (0.67), 2.4 times the rate for protected nests in 1993 (0.33) and 6.2 times the rate for unprotected nests from 1988-1991 (0.13) (Table 5).

With protected and unprotected nests combined, the clutch hatch rate in 1994 was 62.5% and compares with rates of 50.0% for 1992 and 1993. The rate of chicks fledged per egg from protected and unprotected nests combined in 1994 was 0.63. This compares with rates of 0.48 and 0.26 in 1992 and 1993, respectively. For the pre-protection period 1988-1991 clutch hatch rate was 20.0% and the rate of chicks fledged per egg was 0.13 (Table 5).

In 1994 there were 12 chicks fledged from 5 protected nests. This compares with 10 chicks fledged from 5 protected nests in 1992 and 7 chicks fledged from 7 protected nests in 1993. During the three-year period 1992-1994, a total of 29 chicks fledged, all from protected nests. Numbers of chicks fledged from 25 nests during the pre-protection years 1988-1991 ranged from 0 to 3 and totaled 8 over the four-year period (Table 3).

Protective measures for Snowy Plover nesting at Laguna Creek Beach have significantly enhanced their reproductive success.

General Comments

At Laguna Creek Beach there are no areas of the beach where nests are not vulnerable to trampling by pedestrians or where precocial chicks are not subject to substantial human disturbance. Exclosure use in 1992 and 1993 was quite effective in protecting nests from predators as well as from people stepping on eggs. However, disturbance was caused by people approaching too near nest sites and repeatedly flushing incubating birds from nests, leaving the eggs exposed. In 1993 the chick fledging rate slipped to 53.8% as compared with 83.3% in 1992 and 61.5% for the period 1988-1991. During 1994, a symbolic fence was positioned to protect a portion of breeding habitat and provide further protection from high levels of human disturbance for 4 of 5 exclosure-protected nests. The symbolic fencing also provided an area of reduced human disturbance for adults and chicks to seek temporary refuge during periods of high public

use. In 1994 both clutch hatch rate for protected nests (100%) and fledge rate (100%) were high. Clutch hatch rates for protected nests were 80.0% and 71.4% while fledge rates were 83.3% and 53.8% , in 1992 and 1993 respectively. For the pre-protection years 1988-1991 clutch hatch rate was 20.0% and fledge rate was 61.5% (Table 5).

Providing adequate areas of significantly reduced human disturbance, for both nesting and raising chicks, is an important protective measure for enhancing Snowy Plover reproductive success at Laguna Creek Beach. Early protection of nests with exclosures also benefits clutch survival. During the period 1992-1994 there was a total of 26 nests. 14 of 17 (82.4%) protected nests hatched, while none of the 9 unprotected nests hatched (Table 3).

Table 1. Breeding Success of Snowy Plovers at Laguna Creek Beach in 1994

Protected nests are nests with a fenced exclosure.

	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
Unprotected Nests	3	4	0.0	0	0.0	0	—	0	0.00
Protected Nests	5	15	100.0	5	80.0	12	100.0	12	0.80

Table 2. Causes of Snowy Plover Nest Loss at Laguna Creek Beach in 1994

	Unknown	People	Predator
Unprotected Nests	1	1	1

Table 3. Breeding Success of Snowy Plovers at Laguna Creek Beach 1988-1994

Rows of numbers marked with an asterisk were nests protected with an exclosure. Those without an asterisk were unprotected nests.

Year	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
1988	5	10	20.0	1	30.0	3	100.0	3	0.30
1989	11	30	18.2	2	20.0	6	50.0	3	0.10
1990	5	15	20.0	1	13.3	2	100.0	2	0.13
1991	4	9	25.0	1	22.2	2	0.0	0	0.00
1992	3	6	0.0	0	0.0	0	—	0	0.00
1992 *	5	15	80.0	4	80.0	12	83.3	10	0.67
1993	3	6	0.0	0	0.0	0	—	0	0.00
1993 *	7	21	71.4	5	61.9	13	53.8	7	0.33
1994	3	4	0.0	0	0.0	0	—	0	0.00
1994 *	5	15	100.0	5	80.0	12	100.0	12	0.80

Table 4. Causes of Snowy Plover Nest Loss at Laguna Creek Beach 1988-1994

Rows of numbers marked with an asterisk were nests protected with an exclosure. Those without an asterisk were unprotected nests.

Year	Unknown	People	Canine	Skunk	Raven	Predator	Rising water of lagoon	Deserted
1988	4							
1989	5	3		1				
1990	1	2	1					
1991	1				1	1		
1992				1			2	
1992 *				1				
1993							1	2
1993 *							1	1
1994	1	1				1		
1994 * [1]								

1. No protected nests were lost in 1994.

Table 5. Measures of Snowy Plover Breeding Success at Laguna Creek Beach 1988-1994

Rows of numbers marked with an asterisk were nests protected with an exclosure. Those without an asterisk were unprotected nests.

Year	Clutch Hatching Rate	Chick Fledging Rate	Chicks Fledged per Egg
1988-1991	20.0%	61.5%	0.13
1992	0.0%	—	0.00
1992 *	80.0%	83.3%	0.67
1993	0.0%	—	0.00
1993 *	71.4%	53.8%	0.33
1994	0.0%	—	0.00
1994*	100.0%	100.0%	0.80

Nests protected with exclosures and unprotected nests combined

Year	Clutch Hatching Rate	Chick Fledging Rate	Chicks Fledged per Egg
1988-1991 [1]	20.0%	61.5%	0.13
1992	50.0%	83.3%	0.48
1993	50.0%	53.8%	0.26
1994	62.5%	100.0%	0.63

1. No nests were protected 1988-1991.

APPENDIX D

NESTING OF SNOWY PLOVERS AT SCOTT CREEK BEACH, SANTA CRUZ COUNTY, CALIFORNIA IN 1994

Douglas E. George

Report of:

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4990 Shoreline Highway
Stinson Beach, CA 94970

September 1994

Introduction

Scott Creek Beach, in northern Santa Cruz Co., receives heavy recreational use by the public which poses significant threats to the breeding success of Snowy Plovers nesting on this beach. During 1993, an initial effort was made by the Santa Cruz County Office of Parks, Open Space and Cultural Services (POSCS) to protect some nests with exclosures. Of the total number of 5 nests at Scott Creek Beach in 1993, 3 were unprotected and all failed due to desertion. Of the 2 exclosure-protected nests 1 hatched and 1 failed due to desertion (Table 2). All nesting sites and incubating birds were subject to substantial levels of human disturbance which was likely an important factor in the very high rate of 4 of 5 nests (80%) being deserted. Some nests appeared to have been abandoned when disturbed birds were unable to incubate and the exposed eggs were scattered by wind or buried by blowing sand.

During 1994, in addition to the use of exclosures where suitable, symbolic fencing was placed by POSCS around a portion of breeding habitat where 3 of 5 nests were located in 1993. This symbolic fence was composed of a single strand of cable strung between metal stakes. Purpose of the symbolic fence was to provide an area of reduced human disturbance on the beach for potential nesting and as a possible area for adults with precocial chicks to find temporary refuge during periods of high public use.

Monitoring of Snowy Plover breeding success at Scott Creek Beach in 1994 was carried out by Doug George and Ed Jameyson.

Clutch Hatching Success

In 1994, there was a total of 3 nests, all located within the area protected by the symbolic fence. 1 nest was protected with an exclosure with top, and 2 nests did not have exclosures due to unsuitability of terrain. The exclosure-protected nest hatched. Of the 2 nests without exclosures, 1 hatched and 1 was deserted (Tables 1 and 2). The overall hatch rate for 1994 was 66.7% (2 of 3 nests hatching). This compares with an overall hatch rate of 20.0% (1 of 5) in 1993 when 1 of 2 exclosure-protected nests hatched and none of the 3 unprotected nests hatched.

Chick Fledging Rate

In 1994 both chicks from the exclosure-protected nest fledged, and 1 of 2 chicks from an unexclosed nest fledged, for an overall fledge rate of 75.0% (Table 1). In 1993, 2 of 3 chicks (66.7%) fledged from the single hatching exclosure-protected nest (Table 1).

Chicks Fledged per Egg

The number of chicks fledged per egg is a good measure of overall breeding success. In 1994 chicks fledged at a rate of 0.33 per egg (Table 1). This compares with a rate of only 0.14 in 1993 (Table 1), a result of a depressed clutch hatch rate of 20.0%.

Success of Protective Measures

In 1993 there was a total of 5 nests. 3 nests were unprotected: all were deserted. 2 nests were protected by exclosures: 1 hatched and 1 was deserted. The overall clutch hatch rate was only 20.0%. All of the nesting sites and incubating adults were subject to repeated human disturbance which was an apparent factor in the very high nest desertion rate (80.0%) and depressed breeding success.

In 1994 there was a total of 3 nests, all located within an area protected by a symbolic fence. 1 exclosure-protected nest hatched and 1 of 2 nests without exclosures hatched. The overall hatch rate in 1994 (66.7%) was 3.3 times the rate in 1993 (20.0%). Chick fledge rate for 1994 was 75.0% as compared with 66.7% in 1993. The number of chicks fledged per egg in 1994 (0.33) was 2.4 times the rate for 1993 (0.14) (Table 1).

Providing areas of significantly reduced human disturbance in appropriate breeding habitat and around nesting birds, as well as protecting eggs with exclosures (where suitable), are important protective measures for enhancing Snowy Plover reproductive success at Scott Creek Beach.

It is notable that in 1993 and 1994, 7 of 8 nests (87.5%) were located in a dune area near the back of the beach and adjacent to Highway 1. This dune area is scheduled for an extensive dune stabilization and revegetation project that may eliminate the area as breeding habitat for the Snowy Plover.

Table 1. Breeding Success of Snowy Plovers at Scott Creek Beach in 1993 and 1994
Rows of numbers without asterisks were unprotected nests.
Rows of numbers marked with an asterisk were nests protected with exclosures.
Rows with 2 asterisks were nests protected with exclosures and unprotected nests combined.

	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
1993	3	8	0.0	0	0.0	0	—	0	0.00
1993*	2	6	50.0	1	50.0	3	66.7	2	0.33
1993**	5	14	20.0	1	21.4	3	66.7	2	0.14
1994	2	6	50.0	1	33.3	2	50.0	1	0.17
1994*	1	3	100.0	1	66.7	2	100.0	2	0.67
1994**	3	9	66.7	2	44.4	4	75.0	3	0.33

Table 2. Causes of Snowy Plover Nest Loss at Scott Creek Beach in 1993 and 1994
Rows of numbers without asterisks were unprotected nests.
Rows of numbers marked with an asterisk were nests protected with exclosures.

Year	Deserted
1993	3
1993*	1
1994	1

APPENDIX D

NESTING SUCCESS OF SNOWY PLOVERS AT WADDELL BEACH, SANTA CRUZ COUNTY, CALIFORNIA IN 1994

Douglas E. George

Report of:

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October 1994

Introduction

Waddell Beach is located in northern Santa Cruz County. During 1994 nesting of Snowy Plovers occurred on both the portion of beach owned and managed by the California Dept. of Parks and Recreation and the portion of beach in private ownership.

Monitoring of Snowy Plover breeding success at Waddell Beach in 1994 was carried out by Lisa Carp, Doug George, Bambie Hopkins and Bill Hopkins.

Clutch Hatching Success

There was a total of 11 nests. 4 of the 11 nests hatched for a clutch hatching rate of 36.4% (Table 1). Only one quarter of the plover eggs laid hatched.

Fledging Success of Chicks

2 of 8 chicks fledged (reached age when capable of flight) for a chick fledge rate of 25.0% (Table 1).

Chicks Fledged per Egg

The number of chicks fledged per egg is a good measure of overall productivity. In 1994 chicks fledged at a rate of only 0.06 fledglings per egg (Table 1).

General Comments

Snowy Plovers fared poorly at Waddell Beach in 1994 with only 2 chicks fledged from a total of 11 nests. The number of chicks fledged in 1994 (2) is only one quarter the number of fledglings produced in 1993 (8-9). During 1994 both the clutch hatch rate (36.4%) and chick fledge rate (25.0%) were depressed, resulting in a very low level of overall productivity of only 0.06 chicks fledged per egg (Table 1).

Predation by Common Ravens is speculated as a contributing factor in the low level of clutch success. Common Ravens were frequently seen throughout the breeding season both over and on the beach (with up to 5 present on the beach at the same time). Raven tracks were often noted at areas of the beach where Snowy Plovers located their nests. Common Ravens may also have played a role in the depressed chick fledge rate. A Common Raven was observed to fly onto Waddell Beach, seize, and fly off with a live Killdeer chick. In addition, several of the nests were also subject to disturbance by people.

Also of concern is the presence of the invasive non-native European beachgrass (*Ammophila arenaria*) at Waddell Beach. If unchecked, continued encroachment could seriously degrade plover nesting habitat in addition to having a severe impact on the native coastal dune plant community.

Table 1. Breeding Success of Snowy Plovers at Waddell Beach in 1994

Year	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
1994	11	32	36.4%	4	25.0%	8	25.0%	2	0.06

Table 2. Causes of Snowy Plover Nest Loss at Waddell Beach in 1994

Year	Unknown	Deserted
1994	6	1

Table 3. Number of Adult Breeding Snowy Plovers at Waddell Beach in 1994

Year	Males	Females	Total
1994	4	5	9

APPENDIX D

NESTING SUCCESS OF SNOWY PLOVERS AT WILDER BEACH, WILDER RANCH STATE PARK, CALIFORNIA IN 1994

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Introduction

Wilder is a small (0.5 km in length) pocket beach known as a Snowy Plover nesting site since 1922 (Page and Stenzel 1981). While recognized as a sensitive wildlife habitat and within a designated natural preserve closed to public use, the beach continued to receive levels of public disturbance that posed serious threats to the Snowy Plover.

During the 5-year period 1989-1993 the number of chicks fledged from Wilder steadily declined from 18 in 1989 to none in 1993 (Table 3). In 1994 State Parks increased efforts to provide protection for the preserve. This included fencing, improved signing, ranger patrols, and volunteer docents to inform park visitors of the closed and protected status of the preserve. These efforts successfully resulted in a very substantial reduction in the level of human disturbance at the natural preserve, including the beach.

This report documents the reproductive success of Snowy Plovers at Wilder Beach in 1994 and compares it with breeding success for the preceding 6-year period 1988-1993.

Clutch Hatching Success

In 1994 there was a total of 13 nests. 7 hatched for a clutch hatching rate of 54% (Table 1). This compares with a mean clutch hatching rate of 60% for the 6-year period 1988-1993 (range = 40%-75%) (Table 5).

Fledging Success of Chicks

12 chicks fledged (reached age when able to fly) at Wilder Beach in 1994 (Table 1). The total number of chicks fledged in 1994 (12) is double the average for the preceding 6 years, 1988-1993 (range=0-18, mean=6) (Table 3).

The fledge rate of chicks in 1994 was 67% (12 of 18 chicks fledging) (Table 1). This compares with rates ranging from 0.0% - 67% and averaging 32% during 1988-1993 (Table 5).

A good measure of overall productivity is the number of chicks fledged per egg. In 1994 there were 0.36 fledglings per egg, 2.1 times the average rate for 1988-1993 (0.17) (Table 5).

General Comments

1994 was a successful breeding season for Snowy Plovers at Wilder and overall productivity was high. A total of 12 chicks fledged in 1994, reversing a steadily declining trend for the preceding 5 years that saw numbers fall from 18 (1989) to none (1993).

The chick fledge rate (67%), number of chicks fledged per egg (0.36), and total number of chicks fledged (12), all doubled in 1994 as compared with the average numbers for the preceding 6 years, 1988-1993 (32%, 0.17, 6) (Tables 3 and 5).

An increase in effort by State Parks, begun in 1994, to protect the natural preserve has been successful in significantly reducing levels of human disturbance on the beach. It is important that Wilder Beach continue to be protected in order to preserve Snowy Plover breeding habitat and enhance reproductive success.

In addition to providing critical breeding habitat, Wilder Beach is also an important wintering site for plovers. During the past two winters the numbers of plovers on monthly surveys from November to February ranged from 38-45 (winter of 1992-1993) and 50-82 (winter of 1993-1994).

Literature Cited

Page, G. W., and Stenzel, L. E., eds. 1981. The breeding status of the Snowy Plover in California. Western Birds 12:1-40.

Table 1. Breeding Success of Snowy Plovers at Wilder Beach in 1994

	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
1994	13	33	53.8	7	54.5	18	66.7	12	0.36

Table 2. Causes of Snowy Plover Nest Loss at Wilder Beach in 1994

Year	Unknown	Predator	Wind	Tide
1994	3	1	1	1

Table 3. Breeding Success of Snowy Plovers at Wilder Beach 1988-1994

Year	Number of Nests	Total Eggs Laid	Percent Nests Hatching	Number Nests Hatching	Percent Eggs Hatching	Number Chicks Hatching	Percent Chicks Fledged	Number Chicks Fledged	Chicks Fledged per Egg
1988	10	27	40.0	4	40.7	11	45.5	5	0.19
1989	14	38	71.4	10	71.1	27	66.7	18	0.47
1990	17	46	47.1	8	39.1	18	27.8	5	0.11
1991	9	26	55.6	5	38.5	10	40.0	4	0.15
1992	17	47	70.6	12	70.2	33	12.1	4	0.09
1993	8	22	75.0	6	77.3	17	0.0	0	0.00
1994	13	33	53.8	7	54.5	18	66.7	12	0.36

Table 4. Causes of Snowy Plover Nest Loss at Wilder Beach 1988-1994

Year	Unknown	People	Raven	Crow	Canine	Skunk	Gull	Predator	Wind	Tide	Desertion	Infertile
1988	2									3	1	
1989			2	1								1
1990	3	2	2			1				1		
1991	1	1			1						1	
1992	2				1		1		1			
1993								1			1	
1994	3							1	1	1		

Table 5. Measures of Snowy Plover Breeding Success at Wilder Beach 1988-1994

Year	Clutch Hatching Rate	Chick Fledging Rate	Chicks Fledged per Egg
1988	40.0%	45.5%	0.19
1989	71.4%	66.7%	0.47
1990	47.1%	27.8%	0.11
1991	55.6%	40.0%	0.15
1992	70.6%	12.1%	0.09
1993	75.0%	0.0%	0.00
1994	53.8%	66.7%	0.36

Table 6. Number of Breeding Snowy Plovers at Wilder Beach 1988-1994

Year	Males	Females	Total
1988	6-8	6-8	12-16
1989	8-9	8-9	16-18
1990	8-9	8-9	16-18
1991	6-7	7	13-14
1992	10	10	20
1993	7	6	13
1994	5	7	12

APPENDIX E

LIST OF PLANT SPECIES OBSERVED IN THE SCOTT CREEK BEACH STUDY AREA

AIZOACEAE
Carpobrotus edulis

APIACEAE
Foeniculum vulgare

ASTERACEAE
Ambrosia chamissonis
Artemisia douglasiana
Artemisia pychnocephala
Baccharis pilularis
Cirsium vulgare
Conyza canadenisis
Ericameria ericoides
Erigeron glaucus
Eriophyllum staechadifolium
Lactuca serriola

BRASSICACEAE
Brassica nigra
Lobularia maritima

CRASSULACEAE
Dudleya farinosa

FABACEAE
Lupinus arboreus var. *arboreus*

GERANIACEAE
Erodium cicutarium

NYCTAGINACEAE
Abronia latifolia

ONAGRACEAE
Camissonia cheiranthifolia

PLANTAGINACEAE
Plantago coronopus
Plantago lanceolata

POLEMONIACEAE
Navarretia attractyloides

POLYGONACEAE
Polygonum paronychia

PRIMULACEAE
Anagallis arvensis

ROSACEAE
Fragaria chiloensis

SALICACEAE
Salix scouleriana

JUNCACEAE
Juncus bufonius

POACEAE
Bromus diandrus
Cynodon dactylon
Polypogon monspeliensis