

CALIFORNIA COASTAL COMMISSION

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REGULAR CALENDARSTAFF REPORT AND PRELIMINARY RECOMMENDATION

Application No.: 6-98-69

Applicant: North Count Transit District

Agent: Merkel and Assoc.

Description: After-the-fact approval for emergency repairs to an existing railroad trestle consisting of fill within creek and lagoon; follow-up to an emergency permit to remove existing fills and restore areas within creek and lagoon damaged by flooding and emergency repairs; and after-the fact approval of a tidewater goby reintroduction plan

Site: Bridge No. 207.6 at San Mateo Creek and upland and wetland areas on either side of the bridge, San Onofre vicinity, Camp Pendleton, San Diego County APN 101-54-01

Substantive File Documents: San Mateo Creek Emergency Trestle Repair Site Restoration Plan, Merkel & Associates, Inc., dated September 1998; The Status and Distribution of the Tidewater Goby, (*Eucyclogobius newberryi*) on MCB Camp Pendleton, California. Swift, C. C., Baskin, J. N., and T. R. Haglund, 1994; Final Biological Assessment for the North County Transit District San Mateo Bridge Emergency Repairs, San Diego County, Merkel & Associates, Inc., 10/99; Emergency Consultation for North County Transit District Bridge Repairs, San Mateo Creek, San Diego County, California (1-607-00-F-7); Emergency Permit No. 6-98-142-G

STAFF NOTES: The San Mateo Creek Trestle that supports the railroad bridge over San Mateo Creek was severely damaged during February 1998 flood flows and emergency repair work was undertaken immediately without the benefit of any permits from the Commission. This emergency work included activities which resulted in wetland impacts and potentially may have affected the federally listed tidewater goby (*Eucyclogobius newberryi*).

Summary of Staff's Preliminary Recommendation: A near 1000 year flood event and emergency bridge repairs within the San Mateo Creek resulted in adverse impacts to

several varieties of wetland and riparian vegetation which include habitat for the endangered tidewater goby. Both natural and emergency repair actions also potentially resulted in impacts to the tidewater goby itself. Tidewater gobies had occurred within San Mateo Creek at least intermittently in the past. Most experts agree that February 1998 flood waters probably swept the slow moving and not strong swimming gobies from the creek into the ocean where they may or may not have survived. Post flood and construction surveys found no evidence of gobies. It is reasonable to assume the applicant's actions to repair the railroad bridge and manipulate the flow of the creek during repair activities may have resulted in adverse impacts to the gobies. The applicant's actions of cutting and filling in the creek may have removed "fringing and refuge habitat" of the gobies in some areas, which may have contributed to its demise. This habitat provides refuge to the goby during times of swift water flow.

In response to the above concerns, the applicant has attempted to define what impacts are associated with natural flooding and what impacts can be solely attributable to the applicant's emergency actions. In addition to documenting the impacts, the applicant has prepared and implemented a restoration plan. It was implemented in December, 1998 and is designed to mitigate the impacts of its actions on sensitive vegetation and the tidewater goby. Regarding the former, while the ratio of restored habitats to impacts are not strictly consistent with the Commission's traditional mitigation requirements, the resource agencies and the Commission's biologist has found the restoration plan acceptable based on its focus to restore habitats favorable to the tidewater goby and the fact that natural recovery of habitat has occurred that is different from what previously existed. Similarly, the applicant's goby reintroduction plan has been found acceptable by the resource agencies and the Commission's biologist. Pursuant to the plan, tidewater gobies have been transferred from nearby San Onofre Creek and placed in San Mateo Creek. At this writing, the gobies appear to be adapting. The reintroduction plan calls for multiple reintroductions if the initial effort fails.

Based on the above, staff recommends the Commission find the proposed development consistent with Coastal Act policies as all impacts to sensitive resources, as conditioned, have been adequately mitigated. Staff also recommends the Commission finds that the bridge repair work is a permitted use within a wetland as an "incidental public use" pursuant to Section 30233, the impacts are unavoidable, have been minimized to the extent feasible, and, adequate mitigation for all unavoidable impacts is proposed.

PRELIMINARY STAFF RECOMMENDATION:

The staff recommends the Commission adopt the following resolution:

MOTION:

I move that the Commission approve Coastal Development Permit No. 6-98-69 pursuant to the staff recommendation.

STAFF RECOMMENDATION OF APPROVAL:

Staff recommends a YES vote. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

RESOLUTION TO APPROVE THE PERMIT:

The Commission hereby approves a coastal development permit for the proposed development and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. Standard Conditions.

See attached page.

III. Special Conditions.

The permit is subject to the following conditions:

1. Sensitive Habitat and Species/Conformance with Site Restoration Plan, Tidewater Goby Reintroduction Plan and Biological Opinion. The applicant shall comply with the "San Mateo Creek Emergency Trestle Repair Site Restoration Plan," dated, September 1998, by Merkel & Associates, Inc.; the "Reintroduction of the Tidewater Goby at San Mateo Lagoon, dated February, 21, 2000 by Merkel & Associates, Inc., and the "Emergency Consultation for North County Transit District Bridge Repairs, San Mateo Creek, San Diego County, California (1-607-00-F-7)" dated March 22, 2000 by the United States Fish and Wildlife Service. Any proposed changes to the provisions of these plans shall be reported to the Executive Director. No change to the plans shall occur without a Commission-approved amendment to the permit unless the Executive Director determines that no such amendment is required.

2. Maintenance Activities/Future Development. Any future maintenance activities and/or vegetation removal may require an amendment to this permit or a separate coastal development permit and the applicant shall be responsible for contacting the Commission office to gain that determination prior to commencement of work.

3. Other Permits. Within 60 days of issuance of this coastal development permit, the applicant shall submit copies of all other required state or federal discretionary

permits for the proposed project. Any mitigation measures or other changes for the project required through said permits shall be reported to the Executive Director and shall become part of the project. Such modifications, if any, may require an amendment to this permit or a separate coastal development permit.

4. Disposal of Riprap. Prior to the issuance of the coastal development permit, the applicant shall identify the location for the disposal of riprap associated with the removal of the cofferdam. If the site is located within the coastal zone, a separate coastal development permit or permit amendment shall first be obtained from the California Coastal Commission or its successors in interest.

IV. Findings and Declarations.

The Commission finds and declares as follows:

1. Detailed Project Description/History. The applicant proposes the after-the-fact approval for emergency repairs to an existing railroad trestle consisting of fill within creek and lagoon; follow-up to an emergency permit to remove existing fills and restore areas within creek and lagoon damaged by flooding and emergency repairs; and after-the-fact approval of a tidewater goby reintroduction plan. The restoration plan is proposed to mitigate the permanent and temporary impacts associated with the emergency repairs. The emergency repairs have already been completed without benefit of a coastal development permit, in an apparent violation of the Coastal Act.

The North County Transit District (NCTD) is a regional transportation governmental agency established to develop and provide public transit services. NCTD owns and operates railways along the coastline of northern San Diego County and provides priority commuter passenger service on what has historically been a freight and Amtrak dominated route.

In the project area, the railroad is approximately a century old and, with minor exception, the line follows the same route and makes use of the same supporting fills and trestles that were constructed in the late 1800s and early portion of this century. For the most part, the railroad follows the coastline, deviating inland only in those locations where steep coastal bluffs precluded railroad construction. Coastal drainages and lagoons were crossed by the railroad using a combination of causeway fills and wooden trestles. Over the years, concrete and steel bridge structures have been added in some areas to address trestle failures or to span areas considered to be at higher risk of future failure. The San Mateo Creek crossing at the northern boundary of Camp Pendleton, near the San Diego/Orange county line is typical of the crossings of coastal wetlands found elsewhere along the route. The railway travels northwesterly along a long earthen levee prior to reaching the San Mateo Lagoon. At the lagoon, the dike is replaced by a short section of wooden trestle spanning marshland, followed by a concrete supported steel bridge structure spanning marsh and the main San Mateo Creek channel and open water lagoon.

At the northwestern end of the steel bridge, another wooden trestle spans the remainder of the San Mateo Creek floodplain.

The applicant has submitted information pertaining to the events leading up to the proposed project. February 1998 was a particularly wet period. Due both to high ground saturation conditions and large storm events, flooding was extensive throughout the southern California area. Short duration rainfall events within many areas of Orange County, particularly south Orange County near San Mateo Creek, were record setting. The Santiago Peak ALERT rainfall gage recorded 10.67 inches falling on February 23, 1998 (Orange County Public Facilities and Resources Department 1998). This rainfall event exceeded the 50-year return frequency storm of 10.41 inches. More significantly, the storm was one in a series of storms which dropped 23.82 inches over a 72-hour period, resulting in a storm series that exceeded the 200-year return frequencies for both the 48-hour and 72-hour series (Department of Water Resources 1980). In the month prior to the storms of February 23 and 24, a total of 29.45 inches of rain had fallen at the Santiago Peak ALERT station leaving little infiltration capacity within the watershed. In the subsequent 48 hours, 17.91 inches of rain fell, resulting in nearly complete run-off with little if any infiltration. The rainfall during the February 23-24 period fell just 3.43 inches short of reaching the rainfall amount reported for a 48-hour storm series with a 1000-year return frequency.

During this flood period, local channel scour at the railroad bridge removed a full six feet of sediment from the channel floor. Upstream, banks were eroded back as far as 100+ feet. This produced vertical escarpments in excess of eight feet in height on the south bank of the river. The lagoon was nearly tripled in size due to storm delta outflows and subsequent formation of a flood delta shoal. Within the local area (downstream of Interstate 5) export of sediment to the shoreline littoral zone is estimated to have been more than 80,000 cubic yards. Millions of cubic yards likely passed through the lagoon over the flood period and a large subtidal fan extending more than 500 feet offshore is detectable in post-flood aerial photographs. Sizable sand and gravel bars formed at newly defined bends in the creek. Along with the geomorphic changes occurring in the system, over three acres of riparian woodland and freshwater marsh were eroded from around the lagoon and flushed out to sea. Remaining freshwater marsh and riparian habitats were dewatered. Vegetation and debris wracks accumulated in the canopy and at the base of trees remaining along the periphery of the channel flowline. Within the expanded channel, all vegetation was stripped away. While most vegetation that was uprooted was washed out to sea, a number of the largest sycamores remained stuck on the railroad trestle or in the fan of the outer lagoon.

The San Mateo Creek Trestle was severely damaged during February 1998 flood flows and emergency repair work was undertaken immediately. Engineers for NCTD determined that there was a real threat of collapse and temporarily shut down service.

Wooden support piles were both undermined by bed scour and broken by floating debris. Prior to initiation of construction, the lagoon and creek mouth had undergone radical changes due to storm events. Emergency work was undertaken during the night and early morning hours of February 23-24. Trestle repairs continued for several days and included three elements of in-water activities with lasting effects. The first was the reestablishment of the original flowage channel. This was done by excavating a deeper channel to the south of the damaged bridge and piling channel sediments onto the adjacent south bank of the river, as discussed with the USFWS prior to occurrence. The work resulted in creation of an approximately 400 foot long sand and gravel berm within cattail marsh above the water surface of the creek.

The second element of the work to divert flood flows was the construction of a riprap and sand cofferdam and berm around the damaged portion of the bridge itself. Rocks were placed along the upstream face of the bridge and geofabric and sand were placed within and behind the rock to create a cofferdam around the damaged bridge bents so that they could be inspected and repaired. This 90 foot wide and 150 foot long cofferdam was constructed to serve as a flow barrier to protect damaged bridge elements and as a platform from which the bridge could be repaired. This work was undertaken with verbal concurrence from the USFWS, who was on-site during the first day of work. Once constructed, all work at the bridge was conducted from this cofferdam fill, adjacent upland staging areas, and access roads. A small amount of upland baccharis (coyote bush) scrub was impacted at a construction staging area.

The third in-water work element included the partial removal of an accreted sandbar to curb the continued northern shoreline erosion at the bridge by straightening the channel and redirecting the flow back to the channel along the center of the creek. This was done when it became apparent that the first two elements were insufficient to adequately divert flows from the work area and protect the bridge from further damage. To accomplish this work, the southern portion of the sandbar was pushed to the north into a long berm to create a flowage channel across emergent sandbar. This effort resulted in the creation of a berm approximately parallel but divergent from the north shore. This berm extends approximately 370 feet and isolates a sandbar and small slough channel from the main flowline. This upstream work was conducted without the benefit of a coastal development permit.

Prior to initiation of construction, the lagoon and creek mouth had undergone radical changes due to storm events. On February 24, work commenced to divert river flows away from the damaged section of bridge and back to the original flow course. The United States Fish and Wildlife Service (USFWS) was contacted and made a site visit on this date. During the site visit, the USFWS provided some assistance to NCTD in identifying areas of highest biological concern and took numerous photographs of the lagoon prior to NCTD completing any substantial work. These photographs were

instrumental in distinguishing the areas of work and damage caused by NCTD from the significant storm damage which had occurred and which was ongoing at the time trestle repairs were initiated. Restoration of damaged habitats was initiated on March 30, 1998 with the removal of the south-side berm and recontouring of the shoreline to support marsh vegetation. The previously placed fill along the southern side of the lagoon was removed down to the elevation of the marsh plain to leave the cattail and bulrush rhizome mats intact to the extent possible. The remaining in-water portions of the restoration were scheduled to occur in May-June 1998, prior to the closure of the lagoon mouth and the summer rise in the lagoon water surface; however, they were not initiated at the scheduled time at the request of the USFWS so that a longer evaluation period could be used to maximize benefit of the restored areas to tidewater gobies.

The restoration of other damaged areas was deferred at the request of USFWS to allow for increased coordination with and between agency staff with respect to exactly what restoration should be conducted. Extensive habitat alterations occurred because of the significant flood flows; therefore, habitat damage has not been purely restricted to the emergency work performed by NCTD. Significant loss of fringing marsh habitat occurred as a result of river scour. Because of the importance of these marsh areas to tidewater gobies, a target species for restoration efforts in San Mateo Creek, a decision was made by resource agency staff, in conjunction with NCTD consultants, that a strict restoration of the generally unvegetated pre-construction habitat conditions was less desirable than a restoration program that included habitat enhancement elements for the goby. These include fringing marsh and backwater areas. By December 23, 1998, all of the described instream, beach, and staging area restoration work activities were completed. This included removal of the cofferdam fill material, grading of the streambed to elevations detailed in this document, and removal of the temporary silt-fence used during instream activities.

On December 4, 1998 the Executive Director issued an emergency permit to restore the site in accordance with the restoration plan. A follow-up coastal development permit application was submitted, but remained unfiled pending submittal of final mitigation plans and additional information regarding the status of the tidewater goby, an endangered fish species, in the project area.

The proposed development, while located within the unincorporated County of San Diego is not subject to local discretionary permit review by the County because it is within the federal Camp Pendleton Marine Base. While located on federal lands, the project site is under the long-term lease management of California State Parks as a natural preserve. Because there is no certified LCP for this area, the standard of review for this development is Chapter 3 policies of the Coastal Act.

2. No Waiver of Violation. Although development has taken place prior to submission of this permit application, consideration of the application by the Commission

has been based solely upon the Chapter 3 policies of the Coastal Act. Approval of the permit does not constitute a waiver of any legal action with regard to this violation of the Coastal Act that may have occurred; nor does it constitute admission as to the legality of any development undertaken on the subject site without a coastal development permit.

3. Wetland/Marine Resource Protection. Several Coastal Act sections are applicable as follows:

Section 30230

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate.

Section 30231

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

In addition, Section 30233 of the Coastal Act states, in part:

(a) The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and

maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

Finally, Section 30240 of the Coastal Act is applicable, and states:

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

San Mateo Lagoon is located just south of the Orange County-San Diego line on the northern portion of the Camp Pendleton U.S. Marine Base. San Mateo Creek flows into San Mateo Lagoon, both environmentally sensitive habitat areas containing a variety of vegetation types such as riparian woodland, freshwater marsh and saltwater marsh. The project area is within a natural preserve managed by the California Department Parks and Recreation Department. The lagoon provides habitat for at least five State or Federally-listed threatened or endangered species including the arroyo toad, California brown pelican, California least tern, southwestern willow flycatcher, and least bell's vireo and two federally threatened species, the western snowy plover and coastal California gnatcatcher. The lagoon has intermittently supported a population of federally endangered Tidewater Gobies. Thus, the proposed development, located directly within the creek and lagoon, has the potential to adversely affect this sensitive area. Coastal Act Sections 30230, 30231 and 30240 call for the preservation of environmentally sensitive habitat areas and protection against significant disruption of habitat values and state.

As previously described, during the storm event tremendous geomorphic and vegetation changes took place. Long-term habitat damage included drastic changes resulting from flood flows, and the impacts of the emergency work. Significant loss of fringing marsh habitat occurred as a result of river scour. Riparian woodland and freshwater marsh were removed from around the lagoon and the remaining freshwater marsh and riparian habitats were dewatered by the deep scouring of the lagoon and formation of a deep channel connection with the Pacific Ocean.

In light of the dramatic loss of wetlands (over 90% loss of historic wetlands in California), and their critical function in the ecosystem, the Coastal Act's mandate to preserve such environmentally sensitive habitats is well founded. The creek in this location supports several sensitive habitats and the endangered tidewater goby.

Under the Coastal Act, disturbance and/or filling of wetlands is severely constrained. Coastal Act Section 30233 prohibits the filling of coastal waters and wetlands except under the eight limited circumstances cited above. In addition, the project must be the least environmentally damaging alternative and provide feasible mitigation measures to minimize remaining unavoidable adverse environmental effects.

In this particular case, permanent and temporary fill of upland and wetland habitat is proposed to facilitate the repair of a damaged railroad trestle. The Commission finds that the dredging and fill to repair this trestle qualifies as an incidental public service purpose. As noted, NCTD is a regional transportation governmental agency established to develop and provide public transit services. NCTD owns and operates railways along the coastline of northern San Diego County and provides priority commuter passenger. The railroad trestle crossing San Mateo Creek is an essential part of its operating infrastructure. NCTD would not be able to provide its standard service without having the trestle supporting its railroad track in operation; therefore, the proposed emergency repairs constitute an incidental public service. Thus, the proposed development is a permitted use under Section 30233(a)(5) of the Coastal Act.

Once it has been determined that the proposed project is an allowable use under Section 30233 of the Coastal Act, it must also be determined that no other feasible alternative is available that would avoid or lessen the environmental impacts of the development and that mitigation is provided for all unavoidable impacts. Alternatives to the project, in this particular case, are limited. The no project alternative is not feasible because it would result in the interruption of regional transportation in San Diego County. The trestle repair must occur within San Mateo Creek as the railroad trestle spans the creek. Because the entire area in this location is wetlands, impacts to sensitive habitat cannot be entirely avoided; however, they must be minimized to the extent feasible.

The floods of late February 1998 had a significant and lasting direct impact on the lower San Mateo Creek and specifically the San Mateo Lagoon. High velocity scouring flows removed creek bed and vegetation and depleted 63% of the fringing marsh habitat, which

normally serves as flood-flow refuge along the lagoon. To exacerbate this loss, NCTD's emergency work to salvage the railroad trestle impacted an additional 13.8% (0.31 acre) of the fringing marsh habitat. Damage resulting from the work included minor direct impacts to riparian woodlands and an unvegetated sandy fluvial channel for access to Area 3, as well as exotic species dominated wetlands at Area 2 and on the adjacent beach. Direct impacts to a small amount of upland baccharis (coyote bush) scrub occurred at a construction staging area. Habitat impacts associated with flooding and subsequent NCTD activities are quantified in Table 2.

Table 2. San Mateo Creek Impact Acreage Analysis

Area of Impact	BASELIN E	AREAS CHANGED FROM PRE-FLOOD CONDITIONS				
	Pre- Flooding	Flood Impact	Flood Change	NCTD Action	NCTD Change	Cumm. Change
	(acres)	(acres)	(% change)	(acres)	(% change)	(% change)
<i>Non-Wetland Waters</i>						
Lagoon	2.52	4.09	162.3%	-0.34	-0.13.5%	148.8%
Unveg. Sandbar	0.03	0.32	1066.7%	0.14	466.7%	1533.3%
Intertidal Beach	0.42	-0.21	-50.0%	0	0%	-50.0%
<i>Wetlands</i>						
Freshwater Marsh	2.25	-1.42	-63.0%	-0.31	-13.8%	-76.9%
Riparian Woodland	9.98	-1.66	-16.6%	-0.04	-0.4%	-17%
Wet Meadow	0.32	0	0%	-0.01	-3.1%	-3.1%
Invasive Exotics		-0.01		-0.02		
<i>Upland</i>						
Baccharis Scrub	4.16	0	0%	-0.28	-6.7%	-6.7%
Disturbed Roadways	0.51	0	0%	0.86	168.6%	168.6%
Supratidal Beach	5.23	-1.11	-21.2%	0	0%	-21.2%
Lagoon Impact Areas Without Conversion of Habitats (Scour & Fill)						
Lagoon (Pre-Flood)	2.52	2.52				100.0%
Lagoon (Post-Flood)		6.61		1.40		21.2%

As indicated above, the bulk of the impacts to sensitive plants and the tidewater goby occurred as a result of natural flood flows. While the majority of the impacts can be attributed to natural flood flows, the applicant's emergency repair work to the bridge also resulted in sensitive habitat impacts. As noted, trestle repairs included three elements of in-water activities with lasting effects (reestablishment of the original flowage channel, construction of a riprap and sand cofferdam and berm around the damaged portion of the bridge itself, partial removal of an upstream accreted sandbar to curb the continued northern shoreline erosion at the bridge by straightening the channel and redirecting the flow back to the channel along the center of the creek). The first two elements were discussed with the USFWS prior to occurrence. The upstream work was conducted without the benefit of coordination with the USFWS. Although the upstream work was conducted without the benefit of coordination with the USFWS, this berm was ultimately left intact due to the presence of the federally listed arroyo toad. (Because of the presence of the endangered toads on the upstream berm, this feature was not removed but rather, is being revegetated naturally with only directed exotic species control and minor replanting occurring.)

As noted, prior to emergency repairs, the USFWS provided some assistance to NCTD in identifying areas of highest biological concern and took numerous photographs of the lagoon prior to NCTD completing any substantial work. These photographs were instrumental in distinguishing the areas of work and damage caused by NCTD from the significant storm damage which had occurred and which was ongoing at the time trestle repairs were initiated. Also, during emergency repairs and subsequent site restoration, some coordination occurred between North County Transit District (NCTD), owners of the trestle structure, and federal agencies, including the U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (ACOE), the Federal Railroad Agency (FRA), the U.S. Fish and Wildlife Service (USFWS), and U.S. Marine Corps, Camp Pendleton. Based on the fact that the resource agencies provided direction and confirmation on the type and scope of work performed by the applicant, the Commission finds that unavoidable impacts were minimized to the maximum extent practicable, based on the circumstances.

Once it is determined that all unavoidable impacts have been minimized, mitigation for impacts must be addressed. Historically, the Commission has required mitigation measures to assure there is no net loss in either acreage or habitat value for any displaced wetlands. The Commission's practice has been to require a 3:1 mitigation ratio for disturbance of riparian habitats and 4:1 mitigation ratio for other wetland impacts, such as saltwater marsh. In other words, a mitigation area for the creation of new wetlands must be established that is three/four times the size of the existing riparian/wetland area to be removed as a result of the project.

Regarding the proposed mitigation, the Commission typically applies mitigation ratios to habitat impacts based on the type of habitat being impacted, the relative permanence of

impacts, and the quality of the habitat affected. The Commission is also concerned with the level of protection afforded the mitigation habitat following mitigation. In this case the Commission notes unique conditions exist which affect what mitigation is necessary. These include 1) the fact that the impacts associated with the emergency action were a small fraction of natural impacts to the habitat caused by severe flooding; 2) the impacts were temporary and subsequent restoration and natural recovery has generally restored habitats to a somewhat different mix of wetlands than existed previously; and 3) there has been a substantive increase in freshwater marsh within the storm damaged area as a result of the scouring loss of riparian woodland due to storm action. Finally, the drainage occurs on Camp Pendleton federal reservation lands under the long-term lease management of California State Parks as a natural preserve. As a nature preserve such habitat manipulation is permitted only in those areas found by scientific analysis to require manipulation to preserve the species or associations which constitute the basis for the establishment of the natural preserve.

The NCTD emergency work resulted in impacts to 0.39 acres of wetland which is proposed to be replaced by 1.88 acres of restored habitat. Specifically, the restoration includes removal of fills placed to complete construction, revegetation, temporary irrigation, monitoring, and maintenance. In total, the restoration actions exceed the impacts by a ratio of 4.8:1. However, the mitigation ratio is out of balance with the impacts when considering the specific habitat types that were impacted by NCTD. Freshwater marsh impacts would be restored at a ratio of 2.84:1 (0.31 acre of impact and 0.88 acre of restoration), wet meadow impacts would be restored at a 1.25:1 ratio (0.04 acre impact and 0.05 acre restoration), and riparian woodland impacts would be restored at a ratio of 23.75:1 ratio (0.04 acre impact and 0.95 acre restoration). In general, the Commission prefers mitigation be completed in kind at habitat specific ratios that differ from those being proposed. However, in the present situation, natural flood damage resulted in the loss of 1.66 acres of riparian habitat and 1.42 acres of freshwater marsh; natural recovery and restoration has resulted in the return of 3.8 acres of freshwater marsh to the system, 1.55 acres in excess of what existed prior to the floods. This additional marsh has been gained in areas where riparian woodland was destroyed by floodwaters. For this reason, the greater focus on the skewed mix of riparian and marsh restoration is appropriate in the broader context of the lagoon system. The Commission further finds that the distribution of habitats has been developed along with input from the Fish and Wildlife Service to achieve additional strategic benefits to the tidewater goby by creating sheltered refuge areas in the event of future flood flows. The restoration plan and goby reintroduction plans have also been reviewed and found acceptable by the Commission's staff biologist.

Maintenance of the restoration areas will be carried out over a five-year period following completion of all planting activities. This period may be shortened to no less than three years if all success milestones and criteria are met (i.e., 90% vegetative cover, average canopy exceeds 6 ft., willows exceed 9 ft.) and the site has been free of significant maintenance needs for over one year.

Maintenance will consist of weed and exotic plant control, plant replacement, control of vandalism, and incidental activities as necessary to ensure proper site conditions are maintained. No installed irrigation system is proposed for the site in that it is anticipated that the lagoon environment is adequate to obtain the target habitat development without the need for formalized supplemental irrigation. Hand watering will be done on short duration if it is deemed by the project biologist to be warranted.

Monitoring of the site to assess the status of the revegetation effort will be initiated following the completion of planting. Monitoring will occur 0, 6, 12, 24, 36, 48, and 60 months after initiating the monitoring/maintenance. This period would be shortened if final success milestones are achieved early.

The monitoring program will incorporate the use of fixed transects to determine the total plant cover within each planting zone, as well as the percent cover of each species present, and the percent survival of container revegetation materials utilized in the restoration program. In addition to transect monitoring, a general overview of the site will be made in order to assess overall compliance with success criteria, species richness of the site, and areas requiring special modifications to the maintenance program.

Progress milestones have been established in order to guarantee a follow-through to the ultimate achievement of a viable restoration project. Each milestone is accompanied by the maintenance required if the project fails to reach the ultimate goals. Within two months following each monitoring period, a report detailing the results of the monitoring and prescribed remedial maintenance to be performed will be completed. The results will be provided to the Coastal Commission, Environmental Protection Agency, Army Corps of Engineers, USFWS, California Department of Fish and Game, California State Parks, and Camp Pendleton for review and general status information. The Commission's biologist has reviewed the proposal and concurs that the restoration plan, including maintenance and monitoring components, is acceptable such that impacts associated with the NCTD emergency repairs will be adequately mitigated.

The tidewater goby was listed as an endangered species on February 4, 1994. On June 24, 1999 the USFWS proposed to delist the northern portion of the goby and retain those populations in Orange and San Diego Counties as endangered. This proposal was based, in part, on the Service's conclusion that the southern populations are genetically extinct and represent a distinct population segment. The southern populations, which are distributed at six localities, are threatened by habitat loss and degradation, predation by nonnative species, and extreme streamflow events.

The USFWS proposed designation of critical habitat for the tidewater goby on August 3, 1999 (64 FR 42249-42263). The proposed area included San Mateo Creek and its associated lagoon and marsh, from the Pacific Ocean to approximately 1.3 km upstream.

The proposed designation also includes San Onofre Creek, lagoon and marsh. Tidewater goby were potentially directly impacted by NCTD emergency repair work. However, it is impossible to fully determine if gobies were present at the time work was conducted. Tidewater gobies have been detected at both San Mateo and San Onofre Creek on a sporadic basis. The historically dynamic nature of the San Mateo tidewater goby population complicates a determination of impacts to tidewater gobies from NCTD work. Tidewater gobies inhabit watercourses with slow currents and may use slack-water refuges during the winter, rainy season. As discussed earlier, flushing during severe winter storm events is a likely source of tidewater goby mortality. River flooding is reported to destroy burrows and flush tidewater gobies out to sea, as well as changing lagoon salinity. The magnitude of the 1997-98 flood event was sufficient to destroy burrows and flush individuals out to sea. The flooding scoured the channel bed, removing six feet of sediment and upstream banks were eroded back as far as 100+ feet. In addition, loss of adjacent freshwater marsh to erosion and accretion, leading to marsh perching and desiccation, eliminated potential slack water and vegetated goby refuges.

It is not known if tidewater gobies were present within San Mateo Creek upon commencement of NCTD emergency repair work. No sampling was conducted prior to construction. Had sampling been attempted, on-site hydrological conditions would have prevented any such attempts from succeeding. A flow velocity of approximately ten feet per second was flowing through San Mateo Creek from bank to bank during emergency repair work. If, however, gobies were present within the Lagoon they were probably taking refuge in the backwater marsh areas. One such refuge area was filled during NCTD work. In light of the inability to determine the presence or absence of gobies and the affects the work had on this species, if any, NCTD has concurred with USFWS that the proposed work may have had an affect on tidewater gobies. The relative extent of this effect remains unknown. To address this uncertainty, NCTD agreed to participate in the restoration of damage to the system and species reintroduction to the lagoon.

Multiple post-flooding goby surveys were conducted in San Mateo Creek lagoon between March 1998 and April 1999. San Onofre Lagoon was also surveyed during this time period. After repeated surveys, gobies were eventually documented at San Onofre, however, the species appeared to be extirpated from San Mateo Creek and Lagoon. Subsequently, a goby reintroduction plan was developed that includes nonnative predatory species removal, relocation of approximately 500 gobies from San Onofre Lagoon to San Mateo Creek lagoon, success criteria, remedial measures and a 5-year monitoring program. Multiple reintroductions as needed will be completed during the 5-year monitoring period. Special Condition #1 requires the applicant to comply with the provisions of the "San Mateo Creek Emergency Trestle Repair Site Restoration Plan", the "Reintroduction of the Tidewater Goby at San Mateo Lagoon", and the requirements of the USFWS's "Emergency Consultation for North County Transit District Bridge Repairs, San Mateo Creek, San Diego County, California (1-607-00-F-7). Any proposed

changes to the provisions of these plans shall be reported to the Executive Director. No change to the plans shall occur without a Commission-approved amendment to the permit unless the Executive Director determines that no such amendment is required.

Special condition #2 provides that any future maintenance activities and/or vegetation removal may require an amendment to this permit or a separate coastal development permit and the applicant shall be responsible for contacting the Commission office to gain that determination prior to commencement of work.

Several other permits are being pursued through various state and federal agencies having jurisdiction over the project. Thus, conditions of approval and/or mitigation measures may be required from these agencies in their review. As such, Special Condition #3 has been proposed. This condition requires the applicant to submit any discretionary permits obtained from other agencies. Should any project modifications be required as a result of other permits, the applicant is further advised that an amendment to this permit may be necessary to incorporate said mitigation/changes into the project. Special condition #4 provides that riprap located in the project area left over from removal of the coffer dam be removed and its location identified.

In summary, the proposed unavoidable impacts to wetlands have been found to be an allowable use within a wetland and the mitigation of impacts to sensitive vegetation and the tidewater goby have been found acceptable under the Endangered Species Act and the Coastal Act. In addition, based on the above considerations, all unavoidable impacts to sensitive habitats have been minimized and mitigated to the maximum extent feasible. Therefore, the Commission finds the proposed development, as conditioned, is consistent with Sections 30230, 30231, 30233 and 30240 of the Coastal Act.

4. Local Coastal Planning. Section 30604(a) also requires that a coastal development permit shall be issued only if the Commission finds that the permitted development will not prejudice the ability of the local government to prepare a Local Coastal Program (LCP) in conformity with the provisions of Chapter 3 of the Coastal Act. In this case, as conditioned, such a finding can be made.

The subject site is located on Camp Pendleton, a federally-owned and operated military facility used by the United States Marine Corps. In this particular case, the project, while located on the Camp Pendleton Marine Base within the unincorporated County of San Diego, is not subject to local discretionary permit review by the County. While located on federal lands, the project site is under the long-term lease management of California State Parks as a natural preserve. Because there is no certified LCP for this area, the standard of review for this development is Chapter 3 policies of the Coastal Act. Based on the above discussion, the Commission finds that the proposed development, as conditioned, is consistent with all applicable Chapter 3 policies of the Coastal Act and no adverse impacts to coastal resources are anticipated.

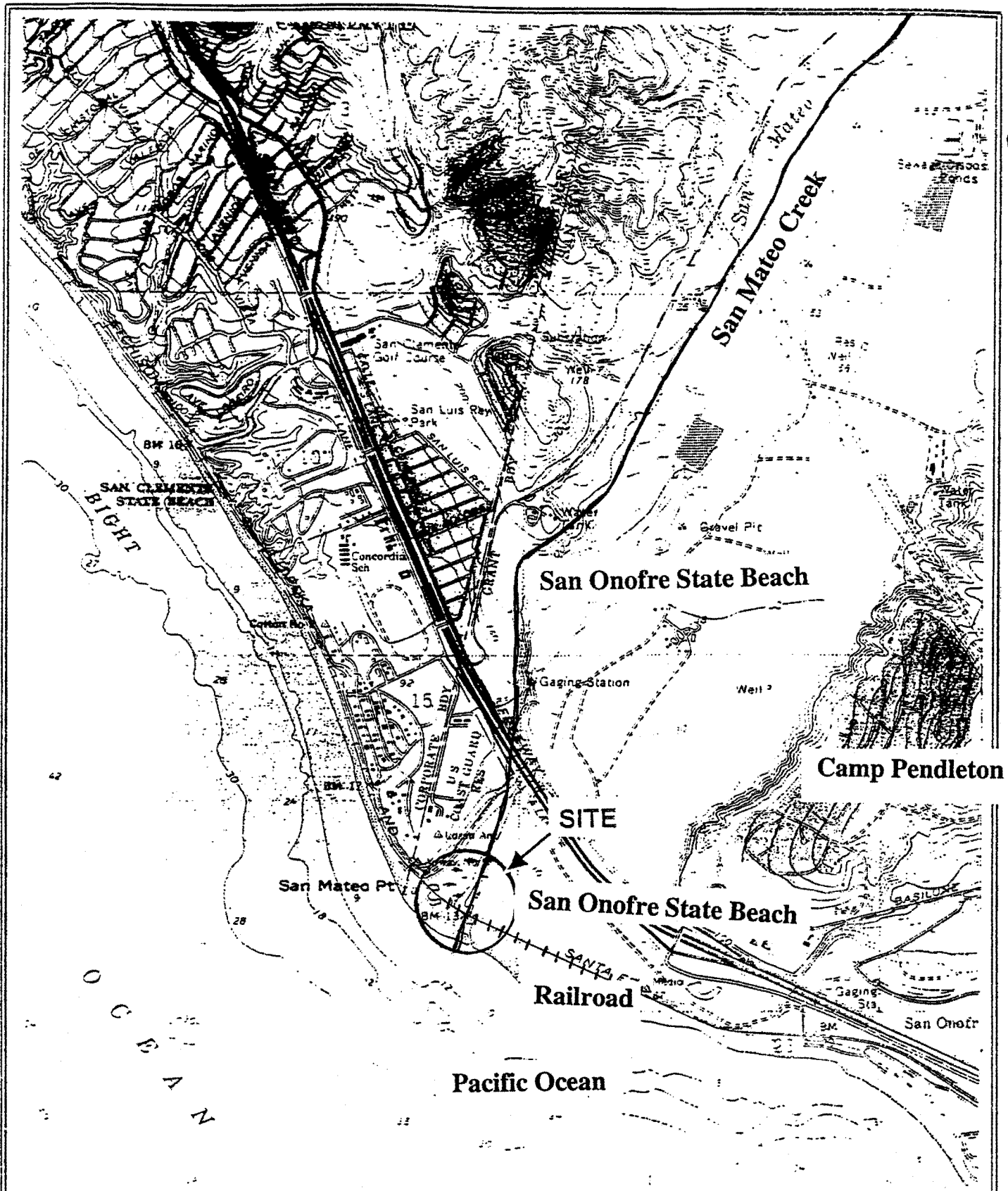
5. California Environmental Quality Act (CEQA) Consistency. Section 13096 of the Commission's administrative regulations requires Commission approval of a Coastal

Development Permit to be supported by a finding showing the permit, as conditioned, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse effects which the activity may have on the environment.

As discussed herein, all proposed wetland and riparian impacts to facilitate repair and maintenance of the railroad bridge are unavoidable and the applicant has proposed mitigation for all impacts, both permanent and temporary. Additionally, impacts to the endangered tidewater goby have been mitigated through the proposed reintroduction plan. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, is the least environmentally damaging feasible alternative and can be found consistent with the requirements of the Coastal Act to conform to CEQA.

STANDARD CONDITIONS:

1. Notice of Receipt and Acknowledgment. The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. Expiration. If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. Compliance. All development must occur in strict compliance with the proposal as set forth below. Any deviation from the approved plans must be reviewed and approved by the staff and may require Commission approval.
4. Interpretation. Any questions of intent or interpretation of any condition will be resolved by the Executive Director or the Commission.
5. Inspections. The Commission staff shall be allowed to inspect the site and the development during construction, subject to 24-hour advance notice.
6. Assignment. The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
7. Terms and Conditions Run with the Land. These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.



Scale: 1" = 2,000'

Project Vicinity Map
Source: USGS 7.5' San Clemente, CA
Quadrangle

Figure

EXHIBIT NO.
APPLICATION NO.

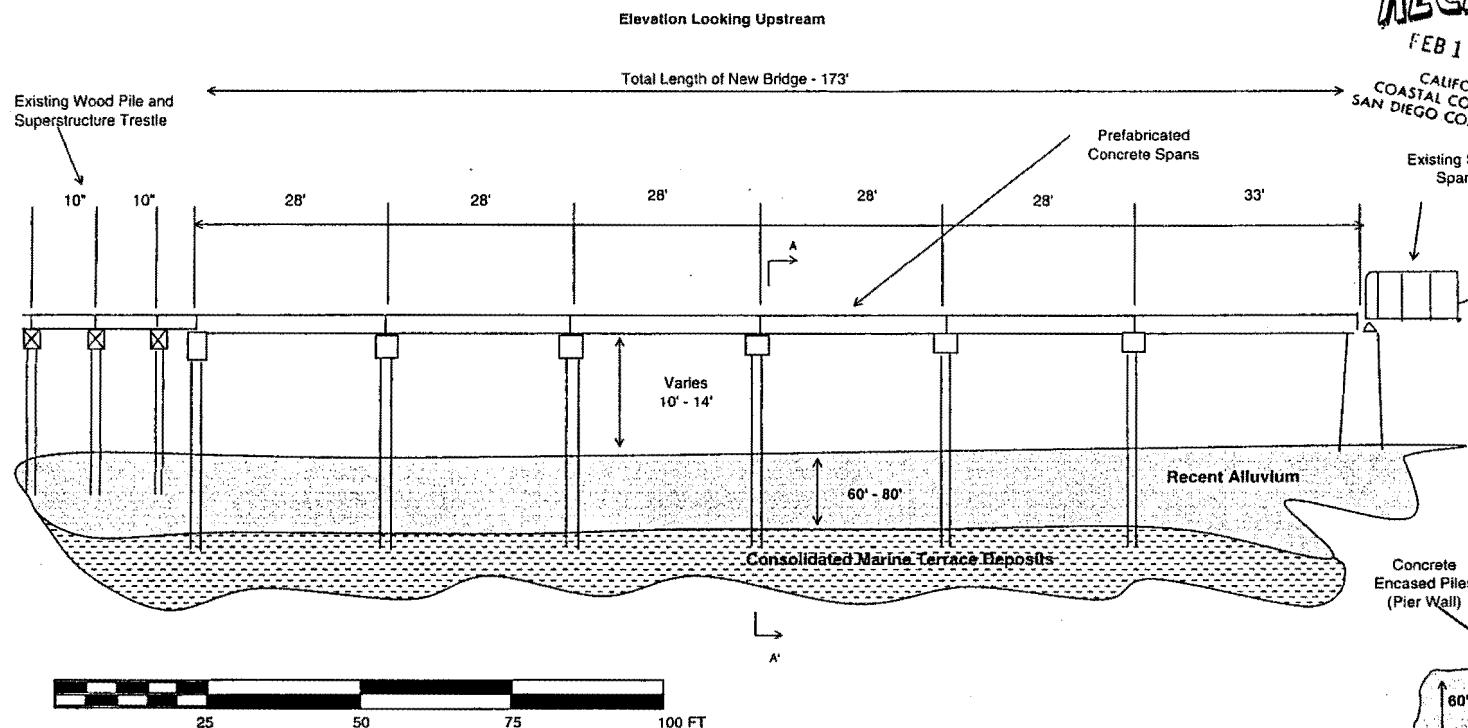
6-98-69

Location Map

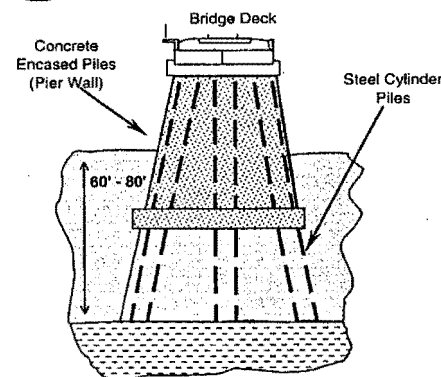
Merkel & Associa

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FEB 15 2000

CALIFORNIA
COASTAL COMMISSION
SAN DIEGO COAST DISTRICT



Section A-A'
NTS

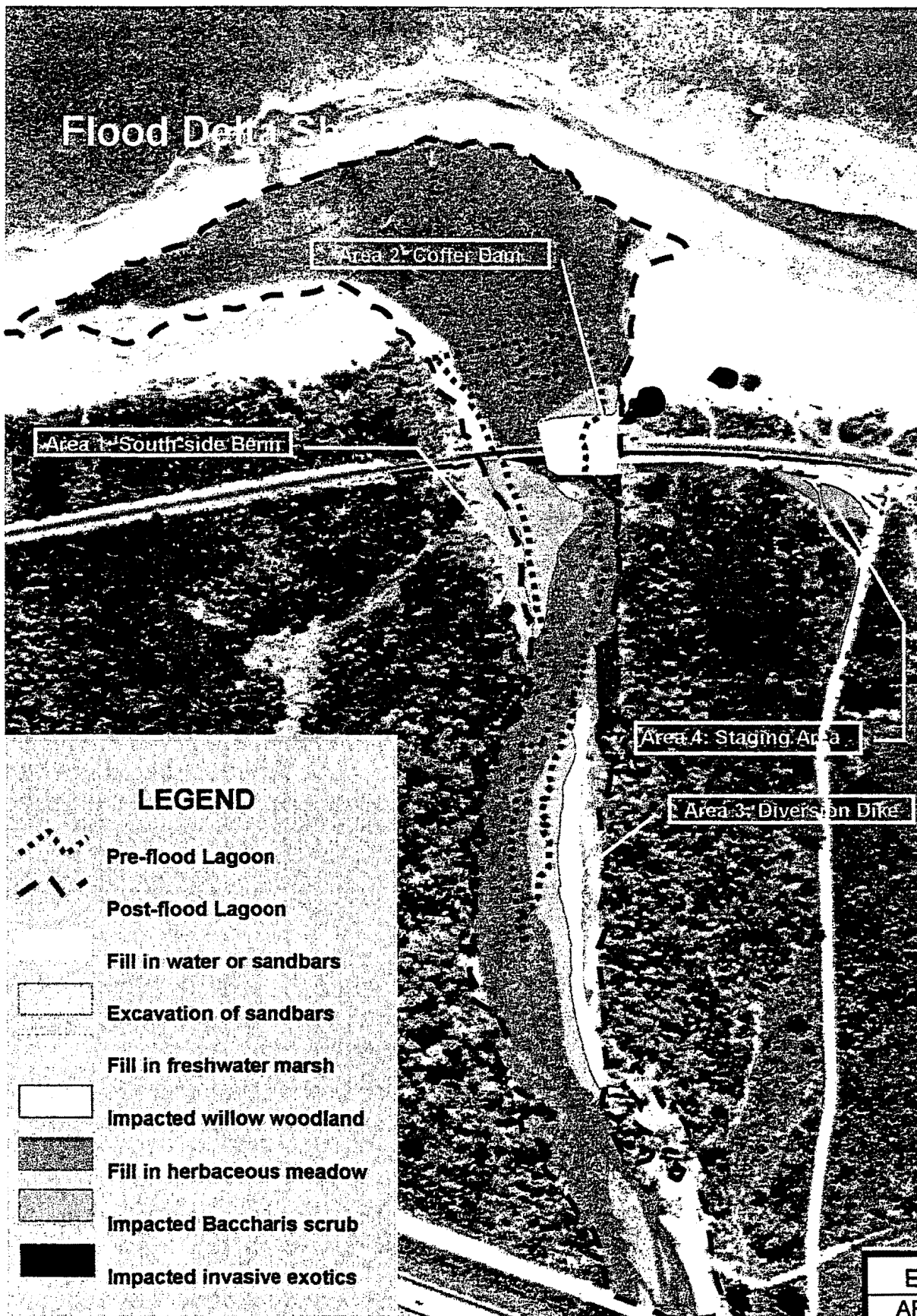


Designed By	Drawn By	Checked By
EH	JG	KM
Field Plans Prepared Under the Supervision of Eric Hankerson, HDR Engineers		

DESIGN STANDARDS TO FOLLOW SOUTHERN
CALIFORNIA REGION RAIL AUTHORITY
ENGINEERING STANDARDS FOR 28, 33 AND 35 FT.
PRESTRESSED CONCRETE SPANS PRECAST
CONCRETE CAPS ON STEEL PILES GENERAL PLAN
SHEETS 1,3,4,10,22 AND
STANDARD 33 INCH DEEP PRESTRESSED CONCRETE
DOUBLE BOX BEAMS SHEETS 1,2.

**NORTH COUNTY TRANSIT DISTRICT
SAN MATEO LAGOON EMERGENCY TRESTLE REPAIRS**

EXHIBIT NO. 2
APPLICATION NO.
6-98-69
Emergency Trestle
Repairs
California Coastal Commission



**Figure 2. Areas of Impact from NCTD Trestle Emergency Repair
(aerial base, March 10, 1998)**

EXHIBIT NO. 3
APPLICATION
6-98-69
Impact Areas

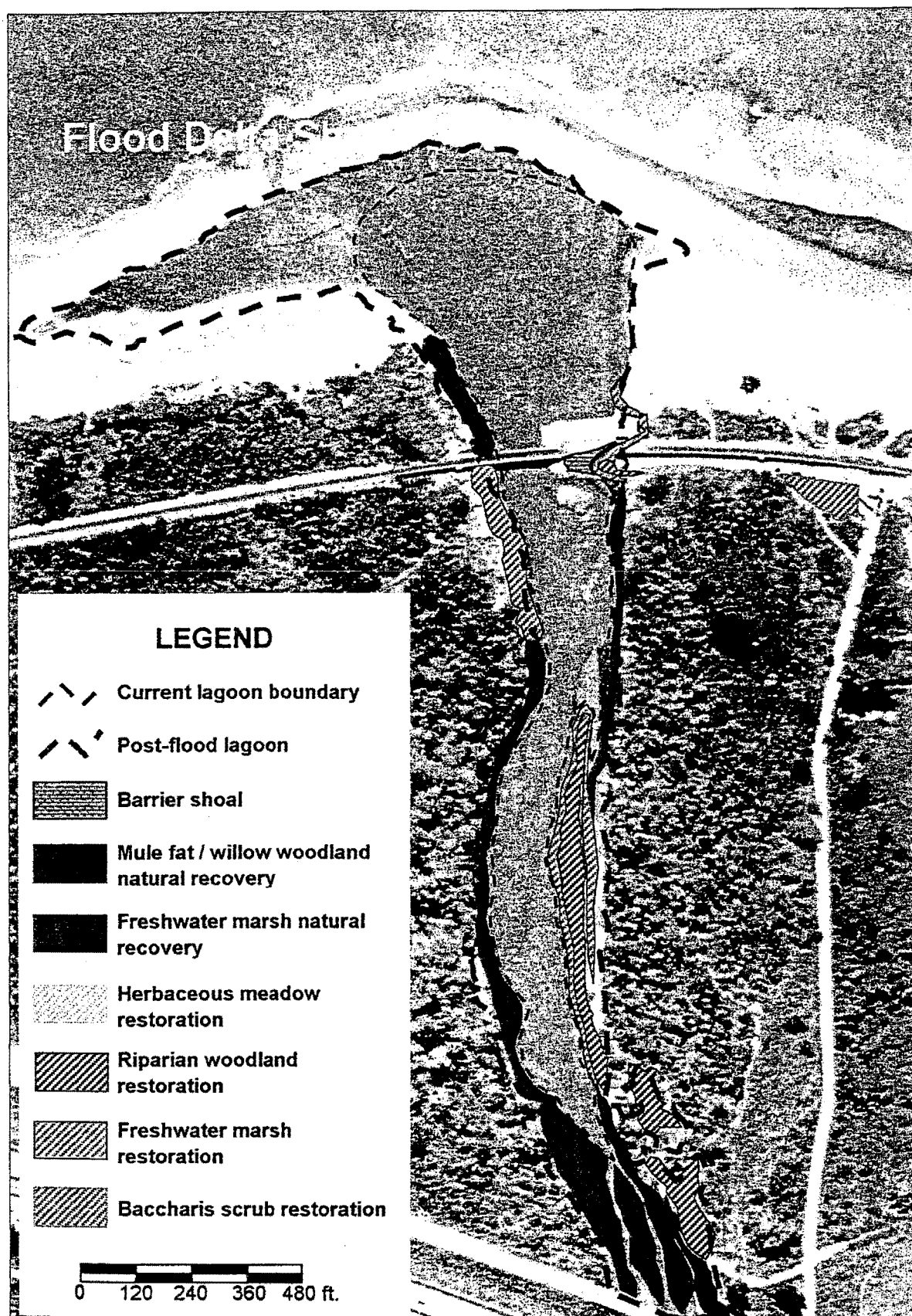


Figure 3. Areas of Recovered, Fill in Vegetation Following NCTD Bridge Repair Impacts.
(aerial base, March 10, 1998, vegetation mapped September 28, 1999)

EXHIBIT NO. 4
APPLICATION NO.
6-98-69

Recovered &
Restored Areas

SECTION A-A'

EXISTING GROUND SURFACE ELEVATIONS AND MAINTENANCE ROAD FOOTPRINT TO REMAIN UNCHANGED

BURIED RIP-RAP TO PREVENT BRIDGE SCOUR

ARUNDO REMOVAL AREA AND BEACH SAND REPLENISHMENT / BALANCE AREA

ENVIRONMENTALLY SENSITIVE AREA

ENVIRONMENTALLY SENSITIVE AREA

Existing Steel Bridge

New Concrete Bridge Section

Existing Wooden Trestle

BURIED RIP-RAP BRIDGE SUPPORT PILE SCOUR PROTECTION TO OCCUR IN EXISTING MAINTENANCE ROADWAY

ENVIRONMENTALLY SENSITIVE AREA

TEMPORARY CONSTRUCTION LIMITS OF WORK BOUNDARY FLAGGING

GEOFABRIC SILT FENCE AND FISH EXCLUSION BARRIER TO EXTEND FROM SURFACE TO BOTTOM DURING EXTERNAL SLOPE EXCAVATION PERIODS

FRESHWATER MARSH

RIPARIAN WOODLAND

BACCHARIS SCRUB

OPEN WATER

EXISTING CONTOURS

PROPOSED GRADING

February 23, 1998 Flood Damage Shoreline

Pre-1998 Flood Damage Shoreline

0 10 20 40 60 FT

SAN MATEO CREEK EMERGENCY TRESTLE REPAIR SITE RESTORATION PLAN

AREA 2: COFFER DAM FILL GRADING PLAN

OWNER: NORTH COUNTY TRANSIT DISTRICT
816 MISSION AVENUE
OCEANSIDE, CALIFORNIA 92054

DESIGNATED AGENT: MERKEL & ASSOCIATES, INC.
3544 MURPHY CANYON ROAD, STE C106
SAN DIEGO, CALIFORNIA 92123
PH. (619) 560-5445
FX. (619) 560-7773

EPA DOC. NO. CWA 404-09a-98-011

AS-BUILT PLANS:
CHECKED BY: _____
DATE: _____

DRAWN BY: _____
CHECKED BY: _____
DATE: _____

SIGNED _____ DATE _____

SHEET NO: G-1

EXHIBIT NO. 5
APPLICATION
6-98-69

**AREA 2: COFFER DAM FILL
GRADING PLAN**

AS-BUILT PLANS
PREPARED BY:

DATE _____

DRAWN BY:

1. *Chlorophyll a* (Chl *a*)

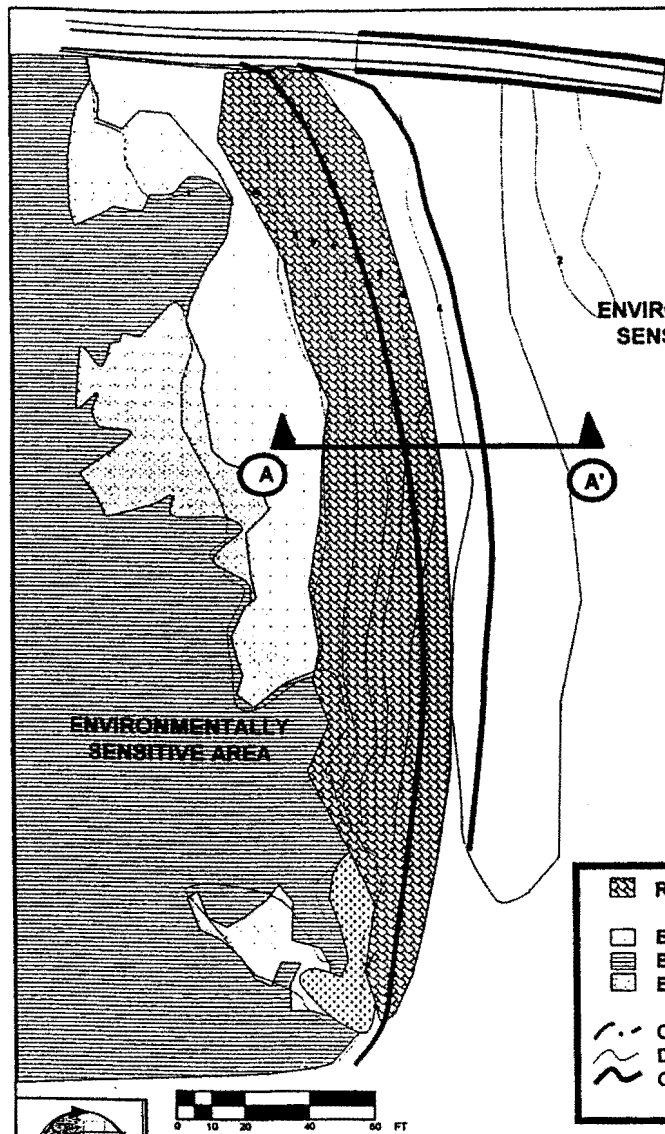
OWNER:
NORTH COUNTY TRANSIT DISTRICT
810 MISSION AVENUE
OCEANSIDE, CALIFORNIA 92054

DESIGNATED AGENT:
MERKEL & ASSOCIATES, INC.
3544 MURPHY CANYON ROAD, STE C106
SAN DIEGO, CALIFORNIA 92123
PH. (619) 560-5446
FX. (619) 560-7773

EPA DOC. NO. CWA 404-02a-98-011

SHEET NO:

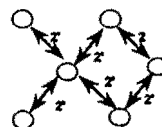
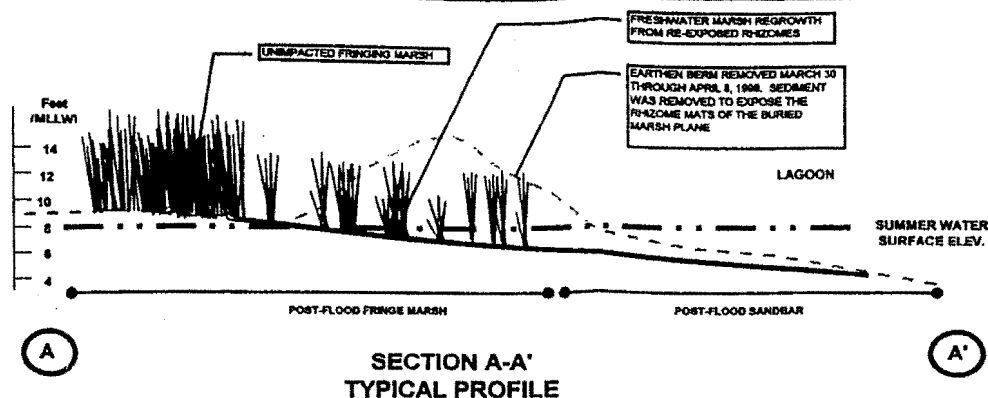
G-1



ENVIRONMENTALLY
SENSITIVE AREA

ENVIRONMENTALLY
SENSITIVE AREA

- RESTORED FRESHWATER MARSH
- EXISTING FRESHWATER MARSH
- EXISTING RIPARIAN WOODLAND
- EXISTING ARUNDO STANDS
- OPEN WATER
- DISTURBED CONTOURS
- CONTOURS FROM MARCH 1998 RESTORATION



REGULAR PLANTING GRID FOR RHIZOMES OF HERBACEOUS MARSH SPECIES

40% *SCIRPUS CALIFORNICUS*
60% *TYPHA LATIFOLIA*
MATERIALS TO BE PLANTED AS RHIZOMES

SUPPLEMENTAL PLANTING IS TO BE CONDUCTED DURING WINTER/SPRING LOW WATER

OWNER:
NORTH COUNTY TRANSIT DISTRICT
610 MISSION AVENUE
OCEANSIDE, CALIFORNIA 92054

DESIGNATED AGENT:
MERCEL & ASSOCIATES, INC.
3944 MURPHY CANYON ROAD, STE C106
SAN DIEGO, CALIFORNIA 92123
PH: (619) 590-6443
FX: (619) 590-7778

EPA DOC. NO. CWA 404-00a-98-011

AS-BUILT PLANS:
PREPARED BY:

DATE:

DRAWN BY:

CHECKED BY:

DATE:

SIGNED

DATE

SHEET NO.

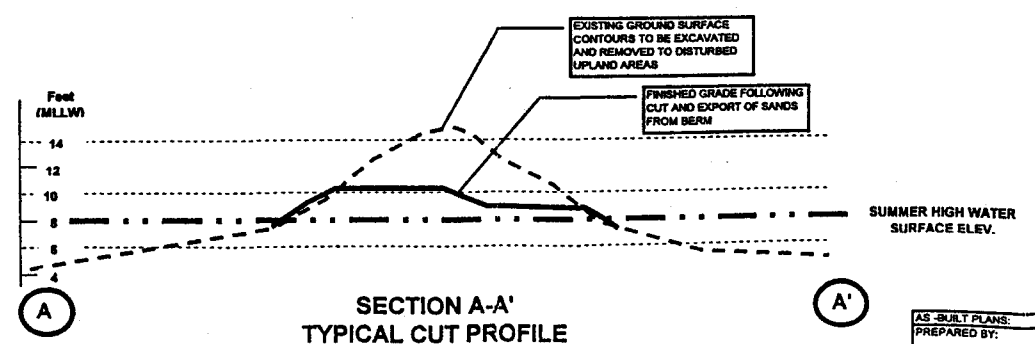
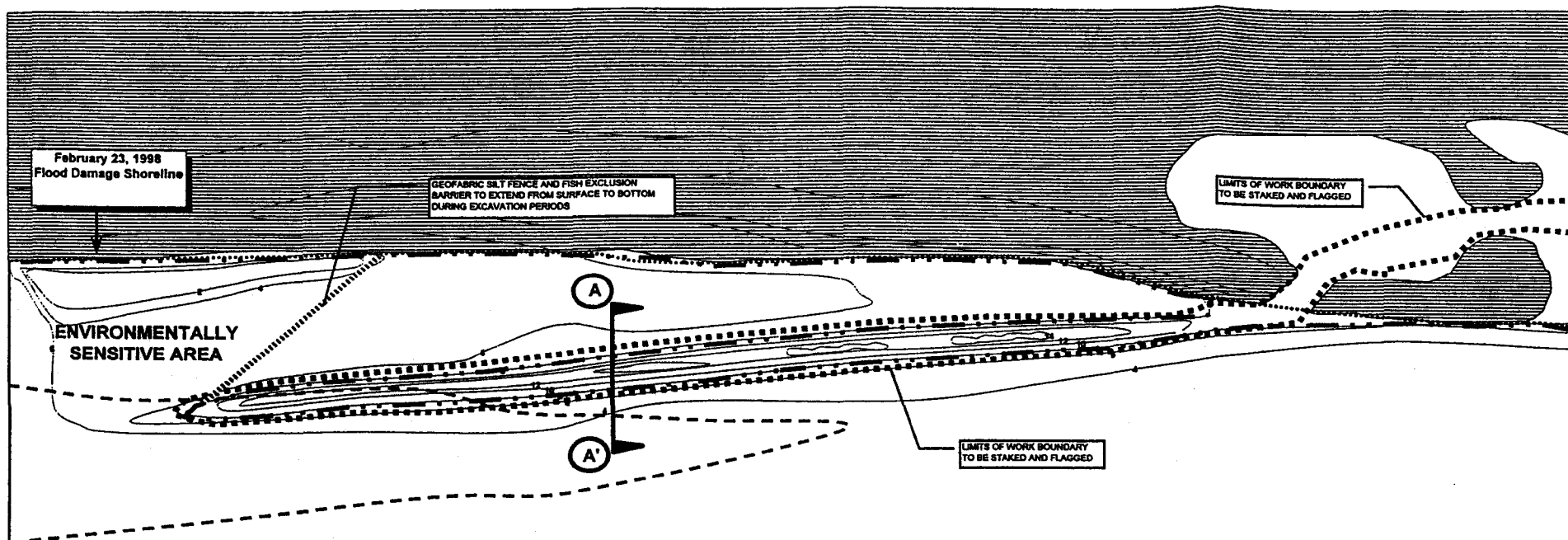
P-3

SAN MATEO CREEK EMERGENCY TRESTLE REPAIR
SITE RESTORATION PLAN

AREA 1: SOUTH SIDE DIVERSION BERM
PLANTING PLAN

EXHIBIT NO. 6
APPLICATION NO.
6-98-69
South Side Diversion
Berm Planting Plan

California Coastal Commission



- FRESHWATER MARSH
- RIPARIAN WOODLAND
- BACCHARIS SCRUB
- OPEN WATER
- EXISTING CONTOURS
- PROPOSED GRADING

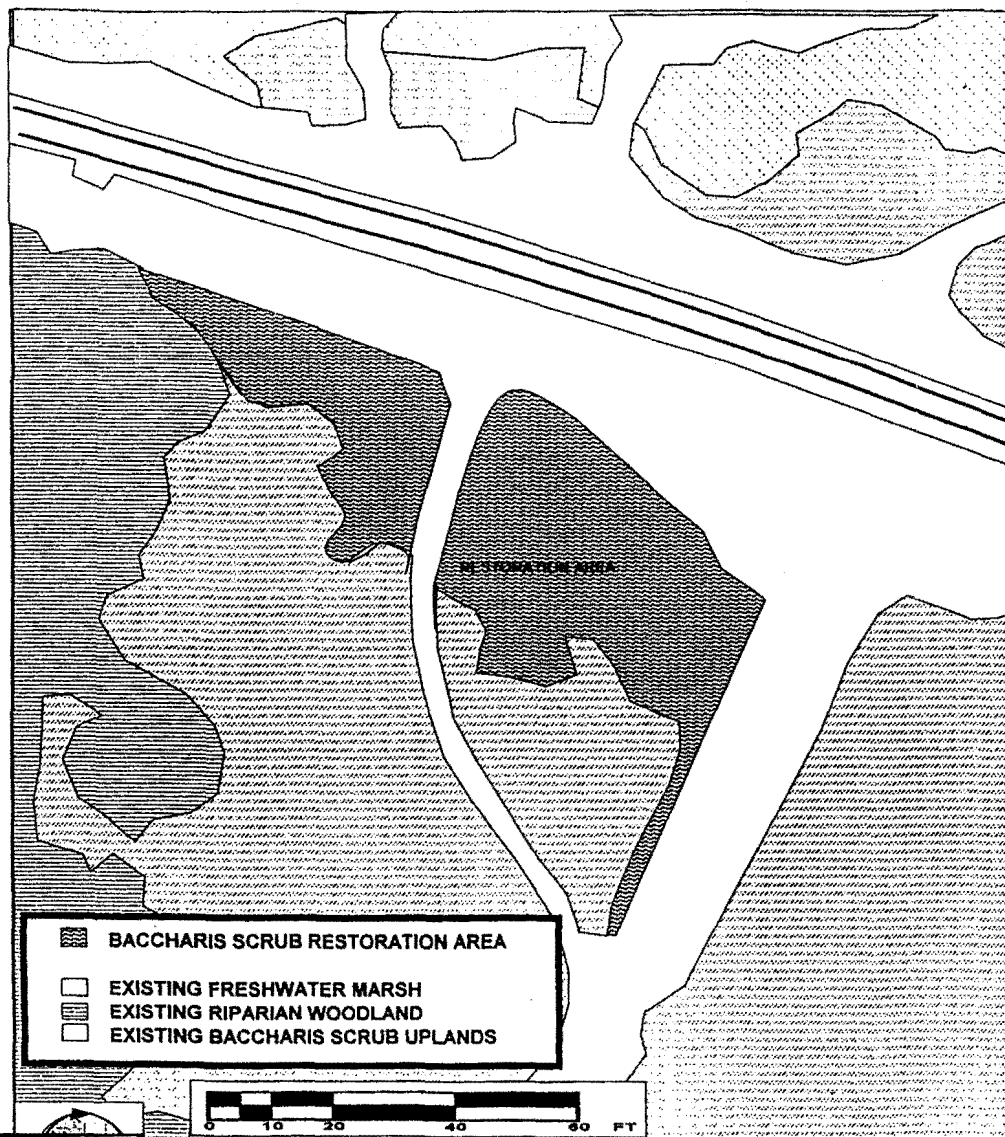


AS-BUILT PLANS: PREPARED BY: _____ DATE: _____ DRAWN BY: _____ CHECKED BY: _____ DATE: _____		OWNER: NORTH COUNTY TRANSIT DISTRICT 810 MISSION AVENUE OCEANSIDE, CALIFORNIA 92064 DESIGNATED AGENT: MERKEL & ASSOCIATES, INC. 3944 MURPHY CANYON ROAD, STE C108 SAN DIEGO, CALIFORNIA 92123 PH. (619) 860-5465 FX. (619) 866-7779 EPA DOC. NO. CWA 404-08a-98-011	SHEET NO: G-2
SIGNED _____ DATE _____			

SAN MATEO CREEK EMERGENCY TRESTLE REPAIR
SITE RESTORATION PLAN

AREA 3: UPSTREAM DIVERSION DIKE
GRADING PLAN

EXHIBIT NO. 7
APPLICATION
6-98-69
Upstream Diversion
Dike Grading Plan
California Coastal Commission



RESTORATION OF UPLANDS DISTURBED AT THE EMERGENCY STAGING AREA

SITE PREPARATION

1. FLAG BOUNDARIES OF INTACT VEGETATION AREAS SUPPORTING PREDOMINANTLY NATIVE VEGETATION
2. DECOMPACT IDENTIFIED DISTURBANCE AREAS USING RIPPER TEETH OR A DISC

SITE RESEEDING

1. HAND BROADCAST A BACCHARIS SCRUB SEED MIX AS FOLLOWS:

SPECIES	LBS/AC
BACCHARIS SARATHROIDES	10
ISOCOMA MENZIESII	4
BACCHARIS CONSANGUINEA	4

2. HAND RAKE OR ROLL SEED INTO SURFACE SOILS

SCHEDULING OF RESTORATION WORK

1. SITE PREPARATION AND SEEDING IS TO BE CONDUCTED IN THE FALL/WINTER OF THE YEAR

OWNER:
NORTH COUNTY TRANSIT DISTRICT
810 MISSION AVENUE
OCEANSIDE, CALIFORNIA 92084

DESIGNATED AGENT:
MENKEL & ASSOCIATES, INC.
3844 SAUNTER CANYON ROAD, STE C106
SAN DIEGO, CALIFORNIA 92123
PH. (619) 866-8445
FX. (619) 866-7773

EPA DOC. NO. CWA 404-086-08-011

AS-BUILT PLANS:

PREPARED BY:

DATE:

DRAWN BY:

CHECKED BY:

DATE:

SIGNED

DATE

SHEET NO:

P-4

SAN MATEO CREEK EMERGENCY TRESTLE REPAIR
SITE RESTORATION PLAN

AREA 4: STAGING AREA UPLAND
RESTORATION PLAN

EXHIBIT NO. 8
APPLICATION NO.
6-98-69
Staging Area Upland
Restoration Plan

California Coastal Commission



Photo Point 1. Freshwater marsh restoration area west of the bridge.

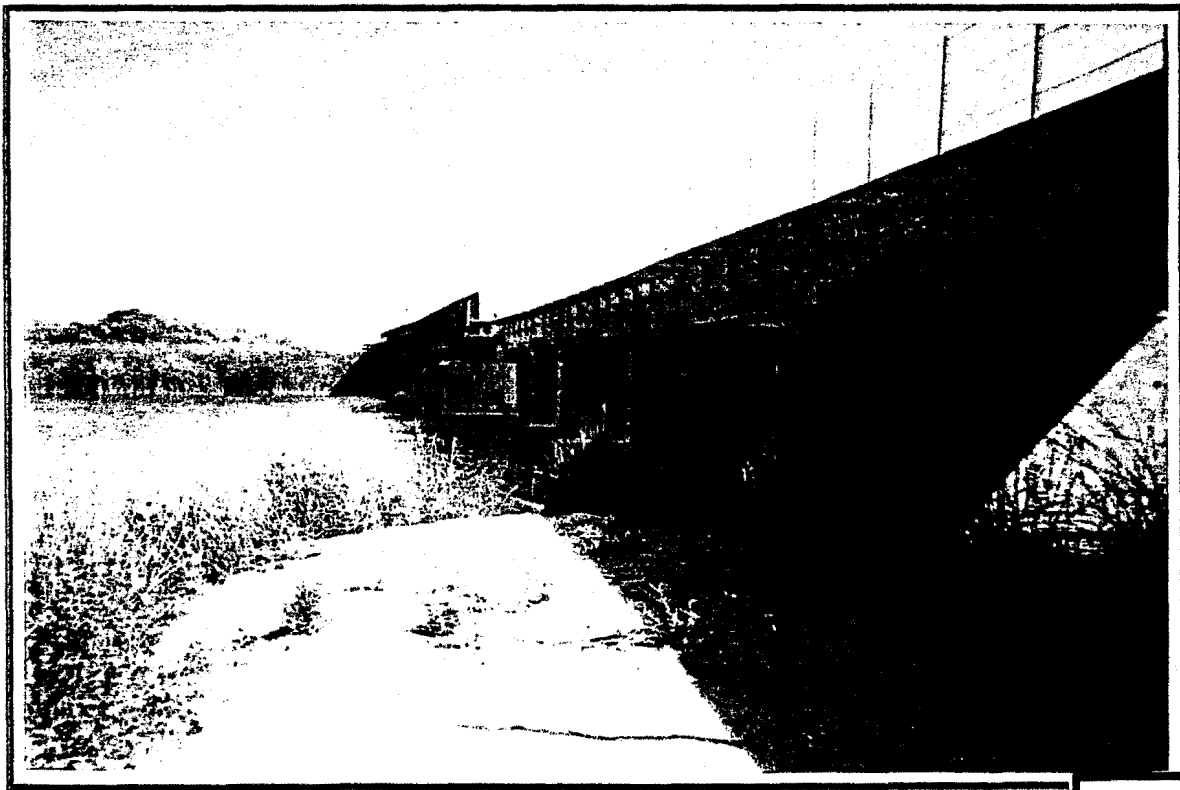


Photo Point 2. Freshwater marsh restoration area east of the bridge (coffer dam removal area).

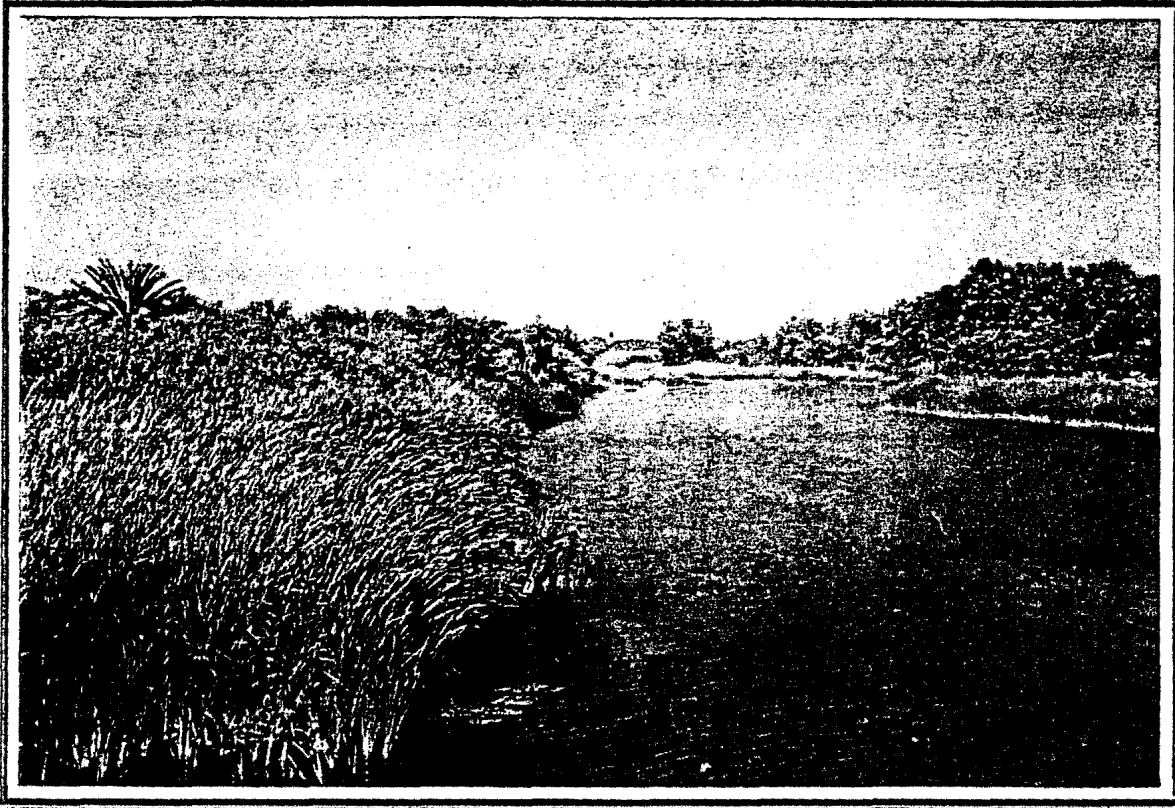


Photo Point 5. Recovering, fill-in freshwater marsh east of the bridge, north side of the creek.



Photo Point 6. Recovering, fill-in riparian woodland on the site of the upstream berm access road.

Merkel & Associates, Inc. # 98-028-01

EXHIBIT NO. 10
APPLICATION NO.
6-98-69

Recovering Sensitive
Areas

 California Coastal Commission



Photo Point 3. Freshwater marsh restoration area west of the bridge (coffer dam removal area).

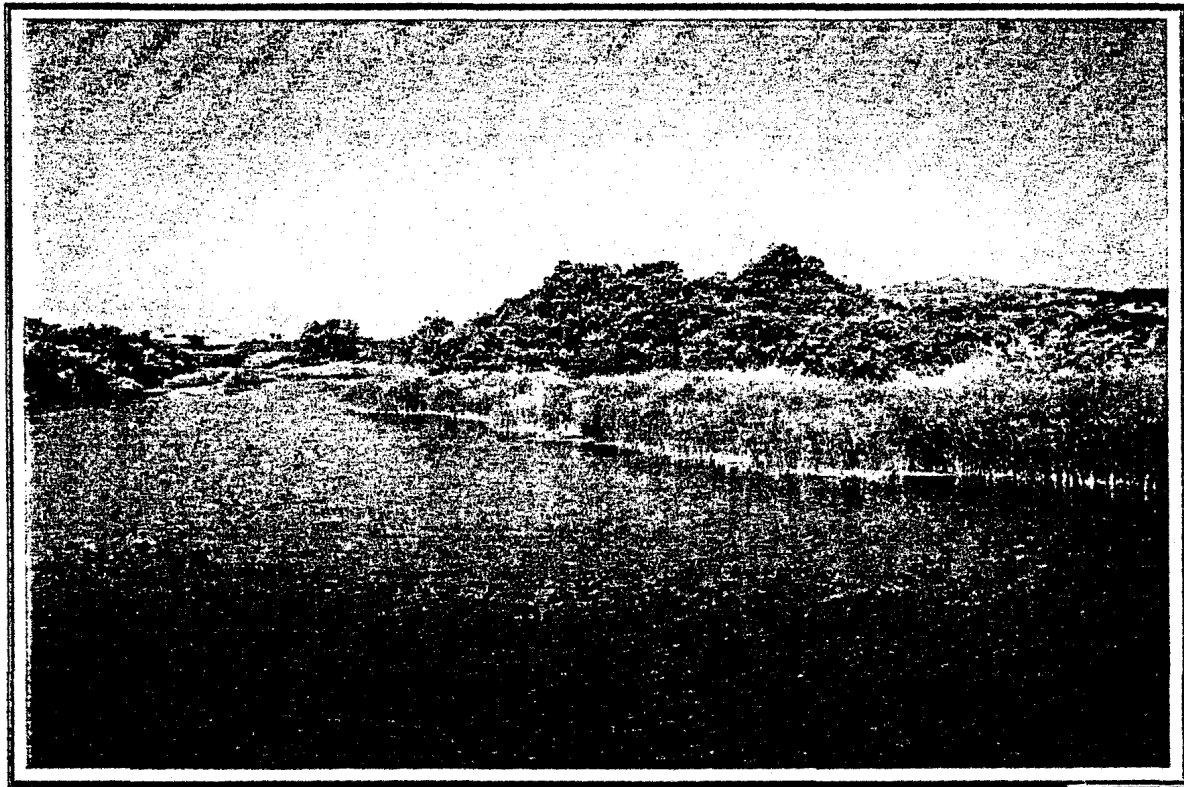


Photo Point 4. Recovering, fill-in freshwater marsh east of the bridge, upstream view.



Photo Point 7. Riparian woodland restoration area east of the bridge.

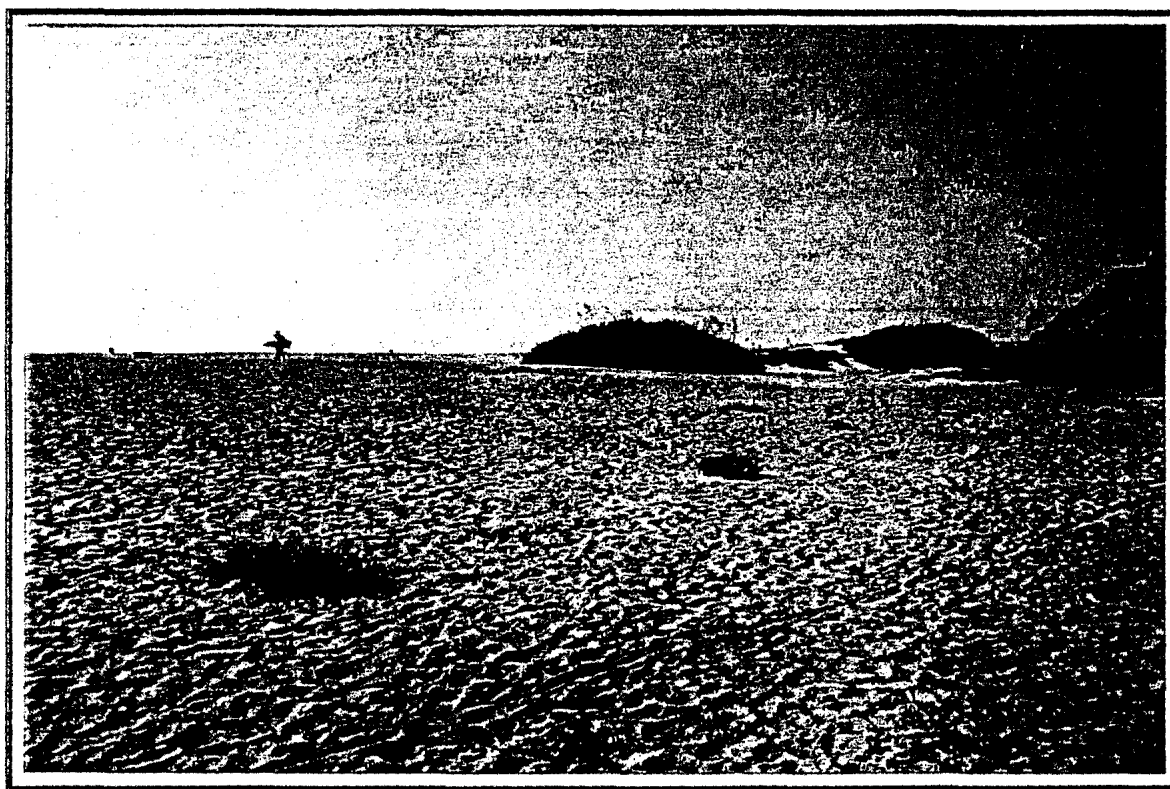


Photo Point 8. *Arundo donax* removal area and sand beach replenishment area.

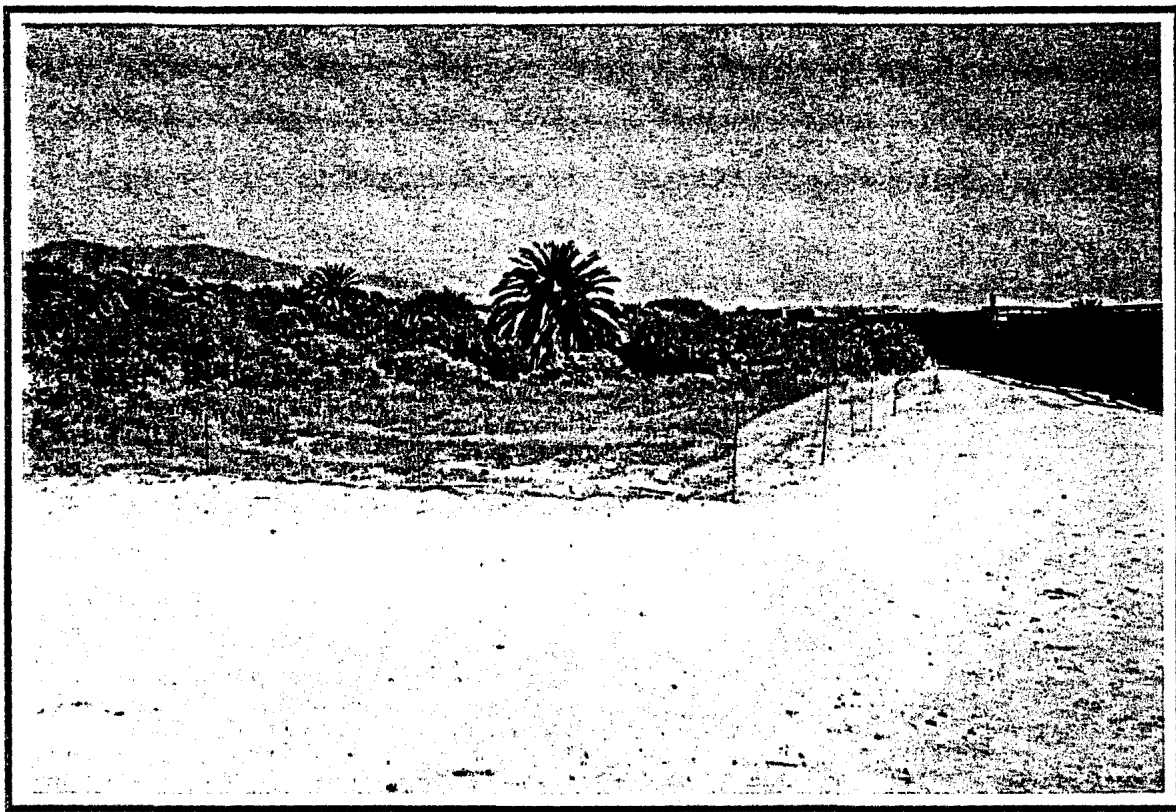


Photo Point 9. Baccharis scrub restoration area, viewed from the north.

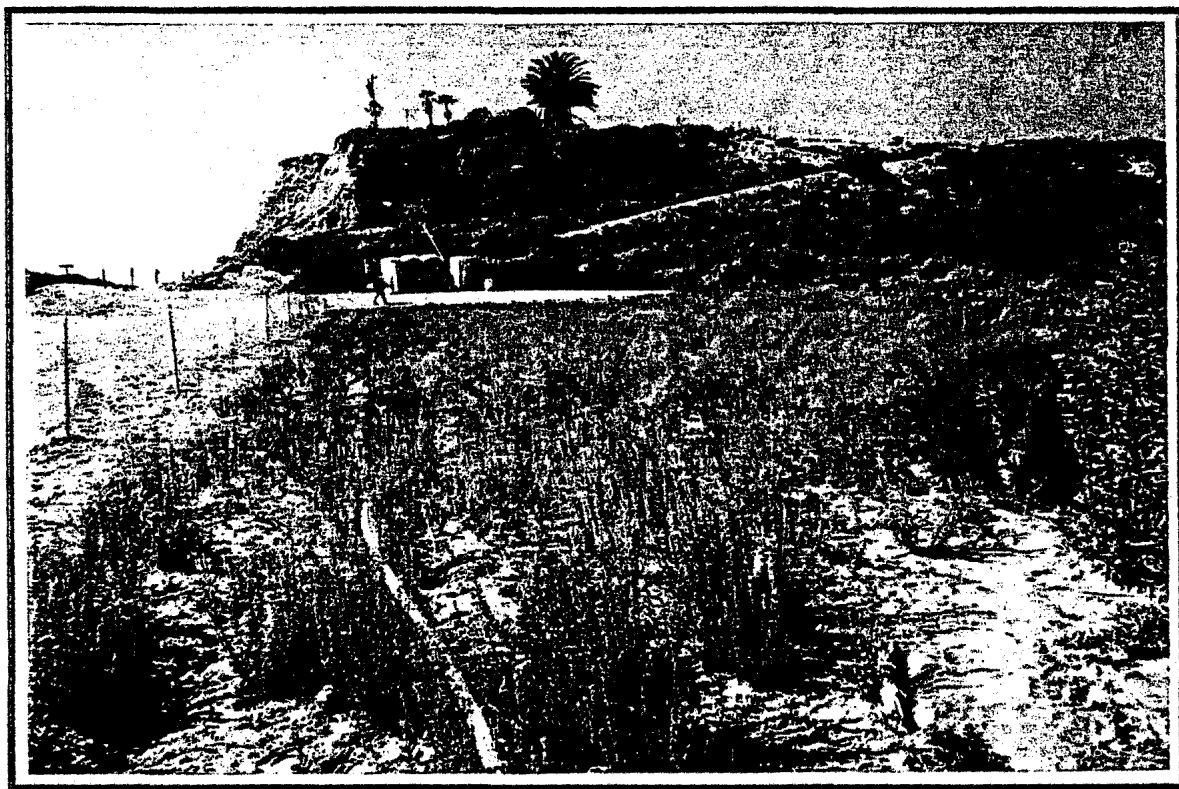


Photo Point 10. Baccharis scrub restoration area, viewed from the southern corner.