ATTACHMENT 35

EELGRASS DISTRIBUTION MAPPING AND VEGETATION SURVEY BAYWARD OF THE NORTH DIKE CHULA VISTA WILDLIFE RESERVE

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Prepared for:

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EELGRASS DISTRIBUTION MAPPING AND VEGETATION SURVEY
BAYWARD OF THE NORTH DIKE
CHULA VISTA WILDLIFE RESERVE

INTRODUCTION

On 16 May 1994, MBC Applied Environmental Sciences (MBC) contracted with the San Diego Port District to survey eelgrass beds (*Zostera marina*) offshore and bayward of the north dike in the Chula Vista Wildlife Reserve (Figure 1).

The eelgrass beds in this area had originally been planted as mitigation in March of 1988; however, subsequent rapid sedimentation from an unknown source caused the beds' almost complete demise. A survey conducted by Pacific Southwest Biological Services (PSBS) in March 1990, 24 months after the transplant, indicated that only small patches of eelgrass totaling 200 ft^2 were present along the length of the original transplant. Eelgrass distribution was similar in an October 1991 survey, but in a subsequent survey performed by PSBS in 1992, eelgrass had expanded to an areal coverage totaling approximately 850 ft^2.

METHODS

Utilizing maps of the site, 100 m transect tapes, 1/8 m^2 quadrats, and slates to record observations and measurements a team of biologist-divers surveyed and mapped the areal extent of the eelgrass beds located between the Reserve's north dike and the southerly limit of the adjacent San Diego Gas and Electric Company cooling water intake channel. Transects, beginning on a line directly perpendicular to the edge of the north dike, were conducted at 31.25 m intervals (104 ft) perpendicular and bayward from the north dike across the eelgrass bed until no further eelgrass was encountered. At the midpoint of each eelgrass transect a single 1/8 m^2 quadrat was placed on the eelgrass and all turions within the quadrat were counted and recorded on the slate.

A natural eelgrass bed, which served as a control to compare the status of the transplanted bed, was located along the Chula Vista Marina Park. This site was also measured along three transects and examined at 30 m intervals. Turion densities were recorded at the mid-point of the three transects.

Utilizing the raw data collected in the field and adjusting for tidal differences to MLLW, eelgrass was mapped onto a aerial survey topographic map of the Chula Vista Wildlife Reserve provided by the District with a scale of 1" equals 100 ft (Figure 2).

RESULTS

Results of the monitoring survey, determined from 25 perpendicular transects, indicated that the eelgrass perimeter encompassed an area of approximately 261,297 ft^2 (Table 1). However, based on density coverage within that perimeter, which ranged from approximately 12 to 100% coverage per transect, there was a maximum of 242,825 ft^2 of eelgrass coverage.

The first perpendicular transect swam parallel to the north dike and out several hundred meters resulted in the failure to detect any eelgrass. The second perpendicular transect went across three small oval patches of eelgrass over the transect length of 100 m plus. The third transect intersected the bed near its westernmost extent, which was estimated to be less than 10 ft from the transect line. Each subsequent transect encountered the bed which became denser with eastward progression. By the sixth transect, and with each subsequent transect through transect 24, density (coverage) was averaging over 90% of each. The 25th transect failed to detect any eelgrass coverage. A swim from the transect parallel to shore to the eastern reach of the bed indicated that the bed had stopped approximately 40 to 50 ft west of the 24th transect.

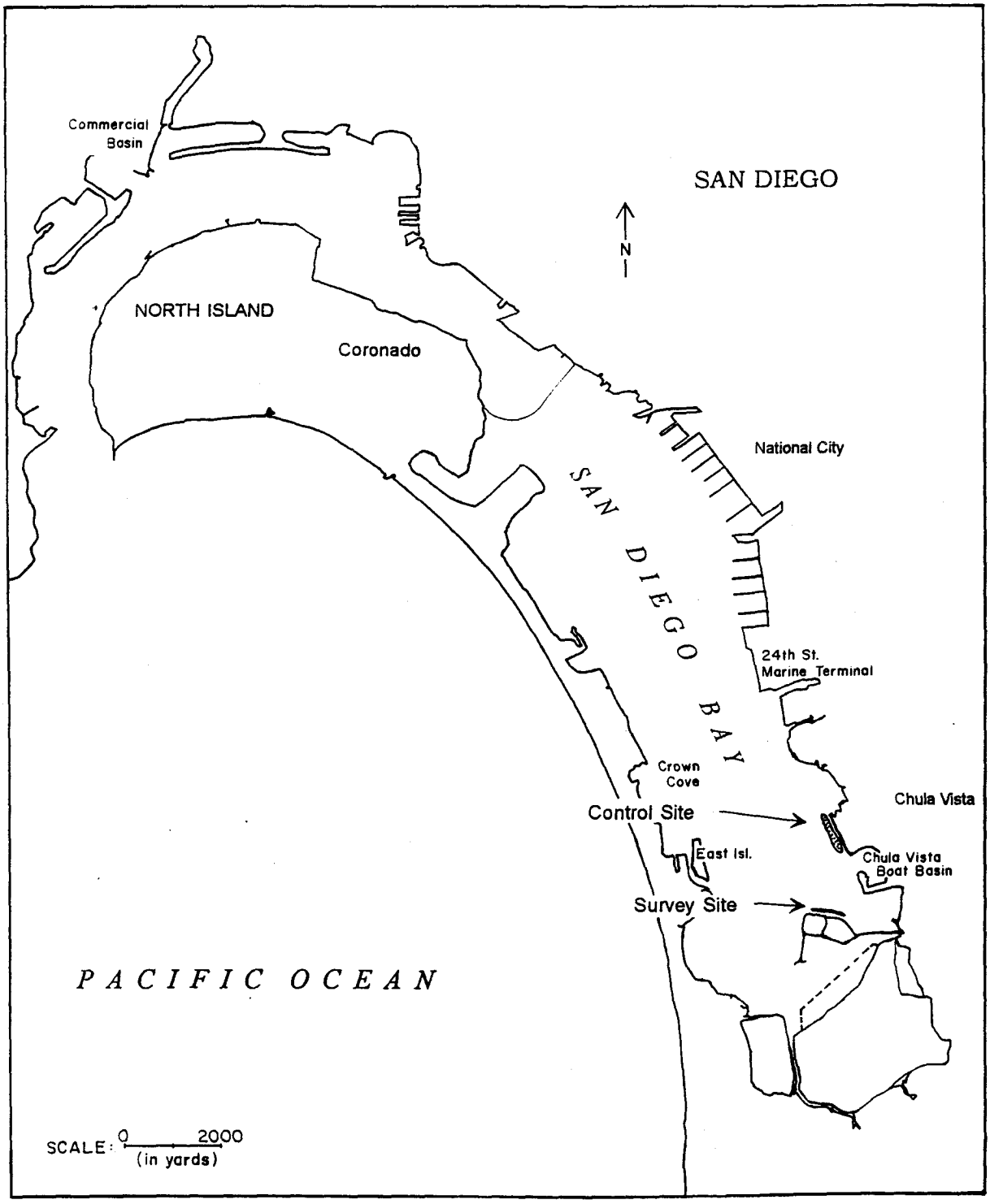

Figure 1. Location of Chula Vista Nature Reserve Island, Chula Vista, California.

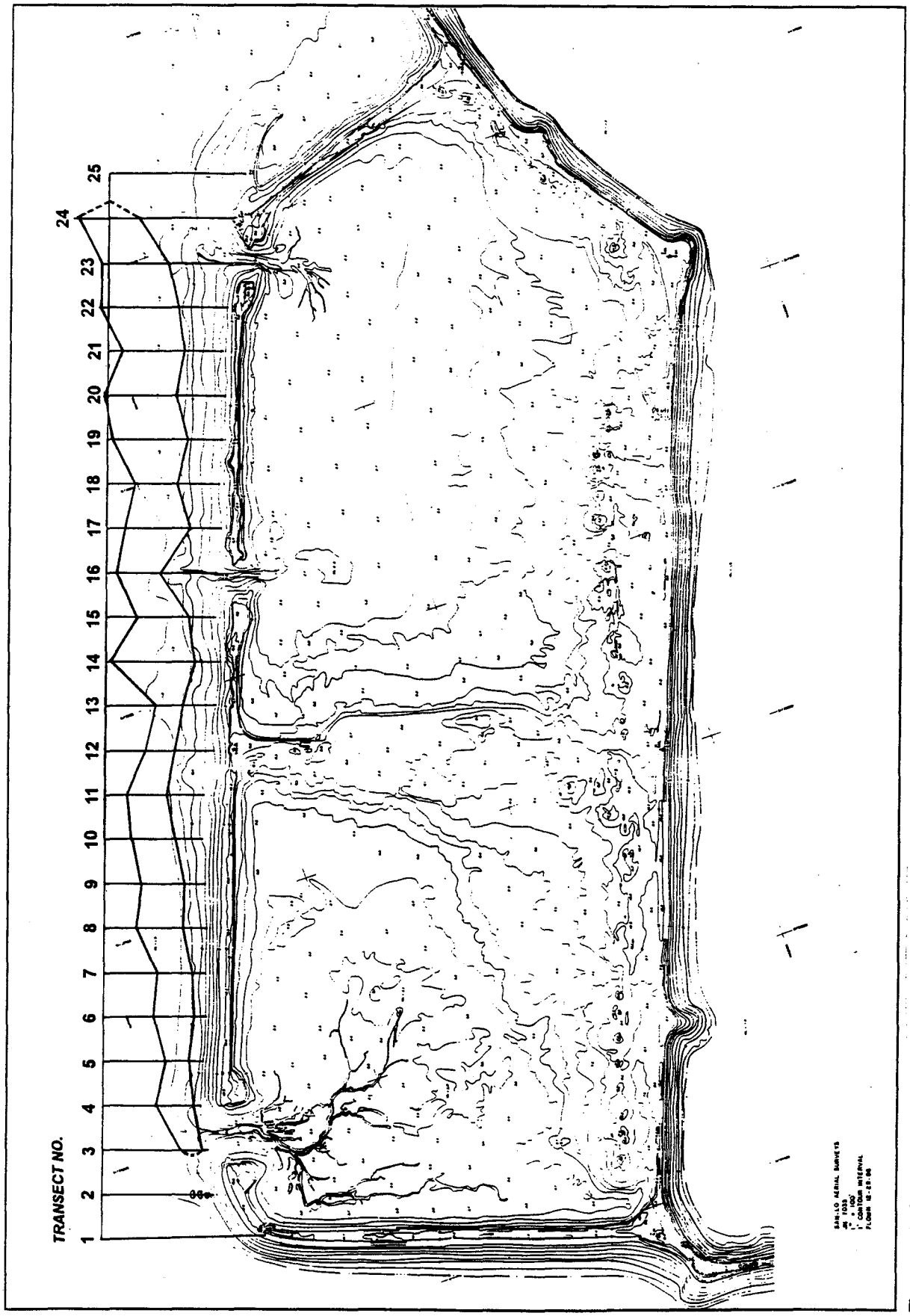

Figure 2. Eelgrass distribution along the north dike of Chula Vista Nature Reserve Island, 16 May 1994 Survey.

Table 1. Chula Vista eelgrass statistics by transect.

Transect	Bed width (ft.)	Areal coverage (sq. ft.)	Percent coverage	Adjusted coverage (sq. ft.)		Turions per m²
1	0	0	0	0		
2	0	83	12.5	83		320
3	48	300	12.5	37.5		160
4	83	6812	25	851.5		384
5	65	7696	62.5	962		320
6	99	8528	90	5330		352
7	81	9360	90	7488		400
8	106	9724	90	9724		288
9	101	10764	90	10764		256
10	100	10452	90	10452		320
11	95	10140	90	10140		192
12	72	8684	90	8684		256
13	65	7124	90	7124		320
14	194	13468	90	13468		336
15	123	16484	90	16484		400
16	100	11596	90	11596		320
17	155	13260	90	13260		288
18	103	13416	90	13416		240
19	179	14664	90	14664		224
20	160	17628	90	17628		240
21	144	15808	90	15808		256
22	183	17004	90	17004		288
23	163	17992	90	17992		336
24	142	15860	90	15860		352
25	0	4450		4005		
	Total	261297		242825	Avg.	298
			Control Bed			
C1	290	---	90	---		384
C2	318	---	75	---		160
C3	319	---	90	---		224
					Avg.	256

Density measurements were inexact. Although, turions were assessed on the bottom, very poor visibility did not allow direct visual turion counts. These counts were made by hand and are, therefore, probably higher than actual densities as many turions have multiple blades that could have been counted as turions. Turion densities in the control bed were also assessed using the same method. Comparisons between the two beds are, therefore, relative to each other, but may not reflect actual visual counts. Turion densities in this survey ranged from 160 to 400 m^2 and averaged 298 m^2 which is considered a medium density eelgrass bed. Control bed turion densities averaging 256 turions per m^2 were slightly lower than the survey site, but would likely have been higher if more measurements had been taken as density at the two beds appeared very similar. The apparent health of the eelgrass beds appeared to be good-to-excellent at both the project and control beds. Individual blade lengths were usually less than 2 ft at the site, whereas they were slightly higher at the control site, probably reflecting the relative shallowness of the survey site versus the control site.

DISCUSSION

Eelgrass growth and area coverage has been explosive during the intervening two years since the previous survey. Total coverage reported in April of 1992 was only 850 ft^2 which is less than 1% of the coverage seen in the current survey. Based on surveys conducted in 1990, 1991, and 1992, it appears likely that the eelgrass located on the north dike's east basin is descended from the original transplant. Western expansion of the bed, however, may be the result of natural recruitment and/or rhizomal propagation.

Apparently the poor visibility limits the eelgrass to less than 3 ft MLLW, as all the eelgrass was found between 0 ft MLLW and 3 ft MLLW, abruptly terminating beyond that depth. Shorter blade lengths at this site than elsewhere in San Diego Harbor are probably the result of the shallow water in which the eelgrass resides. Individual blades of eelgrass tend to be shorter as eelgrass beds become shallower.

The tidal currents are extremely strong and may be responsible for the nutrients that would have been required to sustain the phenomenal growth noted since the last survey. New rhizomes, with healthy appearing green turions, were noted on the east and west ends of the bed indicating the bed is continuing to expand.

Due to poor visibility and the inherent variability in the coverage of an eelgrass bed, the maximum extent of the eelgrass bed could be at least 10% less than the coverage reported in the table which is derived from an estimate based on observations of less than 5% of the bed.

The map generated by this survey is not dissimilar to the area coverage generated by the recent Navy survey undertaken by Southwest Division. That map differed by approximately 10% in size and the position of the western segment of the bed in relation to shore. This inexact placement of the bed in relation to the shoreline allows only rough comparisons to the site specific survey conducted at this location. However, this survey does provide a useful management tool as the sidescan survey of bed was able to document that a large bed existed in the area and placed the bed in the approximate location and provided a rough size estimate of 218,000 ft^2.

LITERATURE CITED

Pacific Southwest Biological Services. 1988. Initial Monitoring Report: Eelgrass Transplanting at the Chula Vista Wildlife Reserve, Chula Vista, California. San Diego Unified Port District Project 87-37. San Diego, California.

Pacific Southwest Biological Services. 1990. Twenty-four Month Monitoring Report Eelgrass Transplanting: Chula Vista Wildlife Reserve Island, Chula Vista, California. San Diego Unified Port District Project 87-37. San Diego, California.

Pacific Southwest Biological Services. 1992. Eelgrass Distribution Survey Bayward of North Dike Chula Vista Wildlife Reserve Island, Chula Vista, California. San Diego Unified Port District Project 87-37. San Diego, California.