



Technical Document 2897

February 1996

Natural Resources Management Plan for Naval Submarine Base, San Diego

Volume 2: Appendices L-N

M. F. Platter-Rieger
Marine Environmental Support Office
NCCOSC NRaD RDT&E Division

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San Diego, CA
92152-5001



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ADMINISTRATIVE INFORMATION

The work detailed in this report was performed for Naval Submarine Base, San Diego, CA, by the Naval Command, Control and Ocean Surveillance Center RDT&E Division, Computer Sciences Corporation, and the San Diego State University Foundation.

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Under authority of
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Volume 2: Appendixes L - N

**Appendix L - Investigations into the Status of the California Gnatcatcher on Point
Loma, San Diego, California, 1993**

**Appendix M - Terrestrial Biological Survey and Inventory of Navy Property on Point
Loma, San Diego, California, 1993**

Appendix N - Insects on Point Loma Navy Property, San Diego, California, 1994

**Appendix L- Investigations into the Status of the
California Gnatcatcher on Point Loma,
San Diego, California, 1993**

INVESTIGATIONS INTO THE STATUS
OF THE
COASTAL CALIFORNIA GNATCATCHER
ON POINT LOMA, SAN DIEGO, CALIFORNIA

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SUMMARY

In order to resolve questions regarding the past and present status of the coastal California gnatcatcher on Point Loma, we designed and conducted a series of six intense, directed field surveys. These surveys yielded only one sighting of a likely transient juvenile bird on Cabrillo National Monument property.

We also investigated historic records, and verified that a California gnatcatcher nest and eggs (1915) and nine adult birds (1908) were collected on Point Loma, but the precise location of their collection on the Point is unknown.

We reviewed three recent reports of California gnatcatcher sightings on Point Loma, considering one as likely to be valid, the other two lacking sufficient details. We also interviewed local ornithologists with extensive experience on Point Loma, and none had recorded or knew of any valid recent sightings.

We assessed and mapped the potential habitat for California gnatcatchers on Point Loma, and concluded that extensive, apparently suitable tracts are present. We pose several hypotheses for the absence of the gnatcatcher in these areas, but the reasons for the absence of a breeding population are unclear.

We make several recommendations for preservation of habitat, future studies, and monitoring.

INTRODUCTION

The purpose of these investigations is to resolve, to the greatest extent possible, questions regarding the past and present status of the coastal California gnatcatcher (*Polioptila californica*) on property owned by the U.S. Government on Point Loma. These questions are important for several reasons: Published data do not provide information sufficient for the historic status of the species on Point Loma to be assessed in any quantitative or qualitative manner. Recent reports of sightings have not been summarized or verified. No dedicated, comprehensive surveys have been undertaken at the ideal season using currently accepted methodologies to determine if California gnatcatchers currently occupy the Point. No evaluation of the suitability of available habitat for California gnatcatchers on Point Loma has been made. Future development plans for Point Loma could adversely affect or preclude establishment of gnatcatcher breeding populations.

The recent listing of the California gnatcatcher as Threatened by the U.S. Fish and Wildlife Service (Anonymous 1993) increases the urgency that these questions be answered, so that informed decisions on the future management of areas of native vegetation on Point Loma can be made.

STUDY AREA

Point Loma (Figure 1) is perhaps the most striking landmark of the San Diego area. It is a peninsula, effectively sheltering San Diego Bay from the prevailing westerly winds and seas. All land from the southern terminus of the Point north, about three miles, is a U.S. government reservation. Portions of the reservation are occupied by a variety of tenants, including Cabrillo National Monument, Fort Rosecrans National Cemetery, the

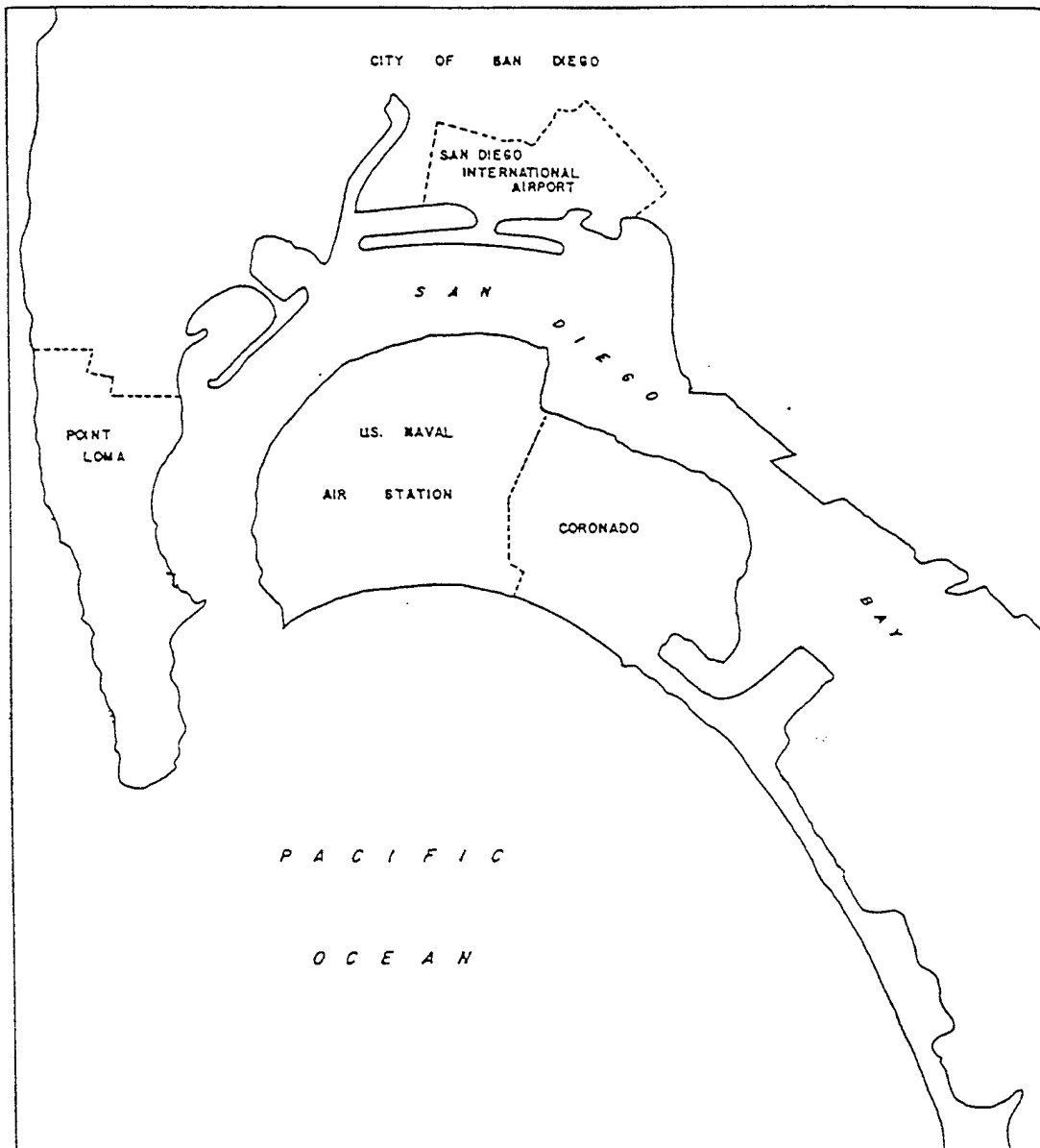


Figure 1. General location of Point Loma.

U.S Coast Guard Lighthouse Facility, Naval Command, Control and Ocean Surveillance Center, Naval Submarine Base, Fleet and Industrial Supply Center, the Fleet Combat Training Center Pacific, City of San Diego Wastewater Plant, and a few other minor facilities.

Most of the developed and disturbed areas on Point Loma lie on relatively flat areas on the east and west sides of the Point or are situated along its spine. The undeveloped areas are typically steeper slopes, frequently cleft by east-west canyons. The area north of the reservation is occupied by Point Loma College on the west side of the Point and extensive residential development elsewhere.

Slightly more than 600 acres of native vegetation and habitat remain on Point Loma, constituting one of the largest parcels of undeveloped coastal land in San Diego County south of Marine Corps Base, Camp Pendelton. Point Loma is effectively isolated from other undeveloped areas by San Diego Bay and urban land uses. In many ways, this isolation has made the undeveloped portions of the Point into a biological island.

METHODS

We undertook three phases of investigation to accomplish the objectives of this contract. The first was to design and conduct intensive field surveys of all areas of native vegetation on Point Loma to determine the presence or absence (*i.e.*, current status) of California gnatcatchers. We also examined undisturbed areas throughout the Point in order to determine what, if any, habitat was suitable. The second phase, to clarify historic occurrence, involved review of published and unpublished literature and first-hand examination of museum specimens. Finally, to determine the recent status of the species, we

interviewed knowledgeable observers, assembling and assessing reports of California gnatcatchers on Point Loma during the last few years.

Field Surveys

Our objective was to design and conduct comprehensive, focused field surveys to determine the current status of California gnatcatchers on Point Loma. The survey design was based on protocols recommended by the U.S. Fish & Wildlife Service (Mock et al. 1990). These protocols call for a minimum of three surveys, done at least seven days apart, between January and June. We expanded this element to include six surveys within the same period.

We divided the areas of native vegetation on Point Loma into three survey units (Figure 2) of approximately 200 acres each. In order to provide maximum continuity and optimal, uniform coverage, an individual observer generally conducted all six surveys in his respective survey unit (Unit 1, W.T. Everett; Unit 2, A.M. Rea; Unit 3, P. Unitt). Each of the three observers have more than 20 years experience observing birds in the field, including California gnatcatchers. Units were also generally surveyed on the same day. During the first survey, we did not use playback of pre-recorded California gnatcatcher vocalizations, but did use them during all subsequent surveys.

Surveys began in the early morning, generally between 0645 and 0700, and continued up to 1130. We suspended surveys until after mid-day then resumed surveying after 1330. We did not conduct surveys on days when the weather was exceptionally cold, hot, wet or windy. For each survey, we recorded weather and observation conditions (Appendix A).

In order to provide consistency between surveys, we

established a series of numbered observation points, each point providing coverage of a discrete area (Figures 3, 4, & 5). We established observation points, plotting them on a map during the first survey. In the field, a variety of factors dictated the location of each point and the area covered from that point. These factors included topography, density of vegetation, visibility, accessibility, and noise from wind, surf, traffic, mechanical equipment, aircraft, and construction. As we established each point, we marked it in the field with numbered, fluorescent orange survey tape to facilitate relocation during subsequent surveys. We removed the markers during the final survey.

We adopted a very conservative approach in establishing the locations of survey points and designating areas covered by each point. In most cases, actual limits of visual and auditory range overlapped. At each observation point we stopped, listened, and played pre-recorded California gnatcatcher vocalizations (for all but the first survey) for three minutes. Observations continued as we progressed to our next observation point. In order to counter possible biasing effects of morning versus afternoon survey periods, we conducted the last three surveys in reverse order.

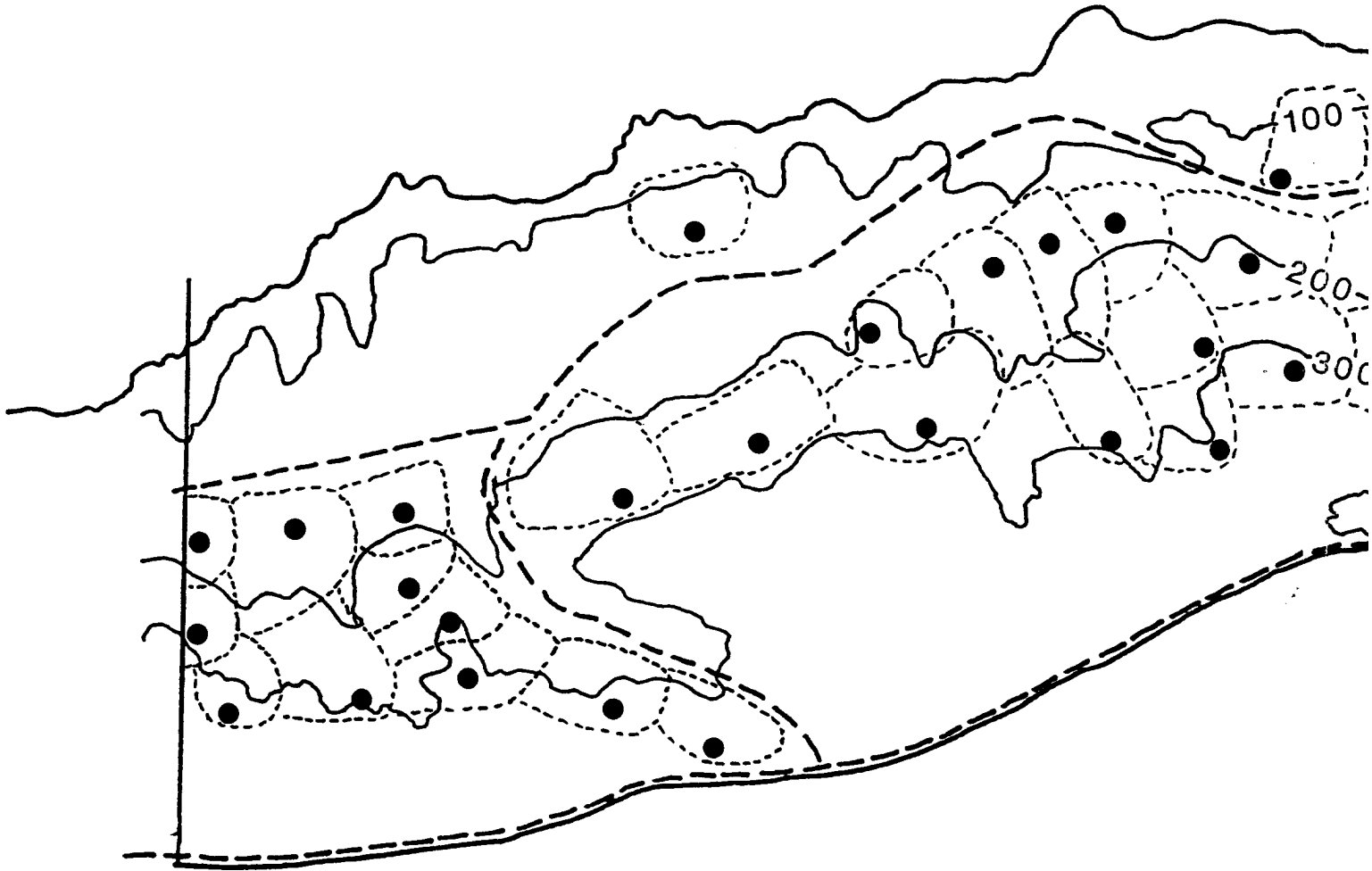
Although our primary objective was to detect California gnatcatchers, we recorded all observations of birds, including species and numbers (Appendix B).

During our surveys, we noted vegetation and topography in relation to the habitat's suitability for California gnatcatchers. During Survey # 5 we mapped these respective areas.

Historical Records

We reviewed the pertinent ornithological literature for

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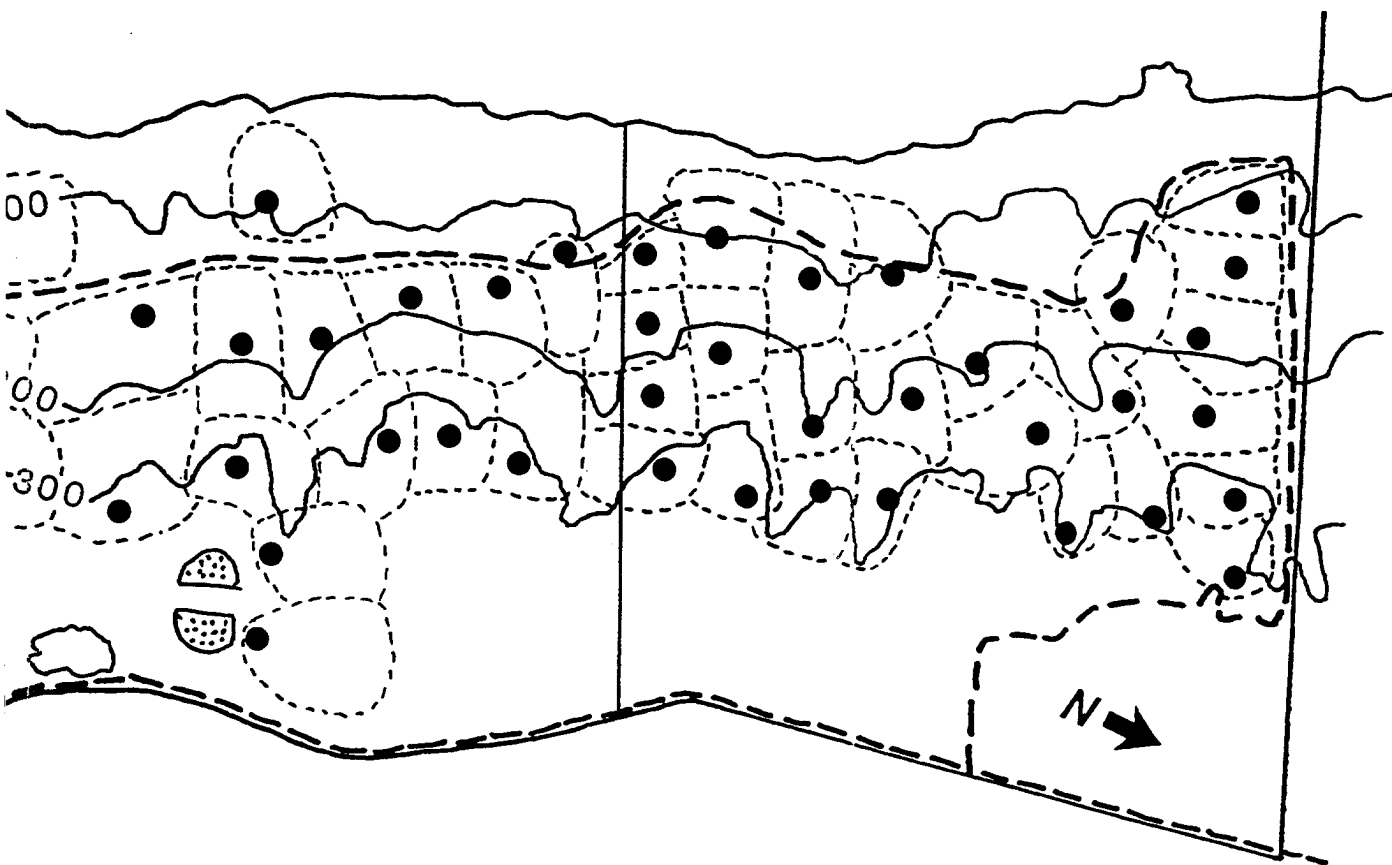
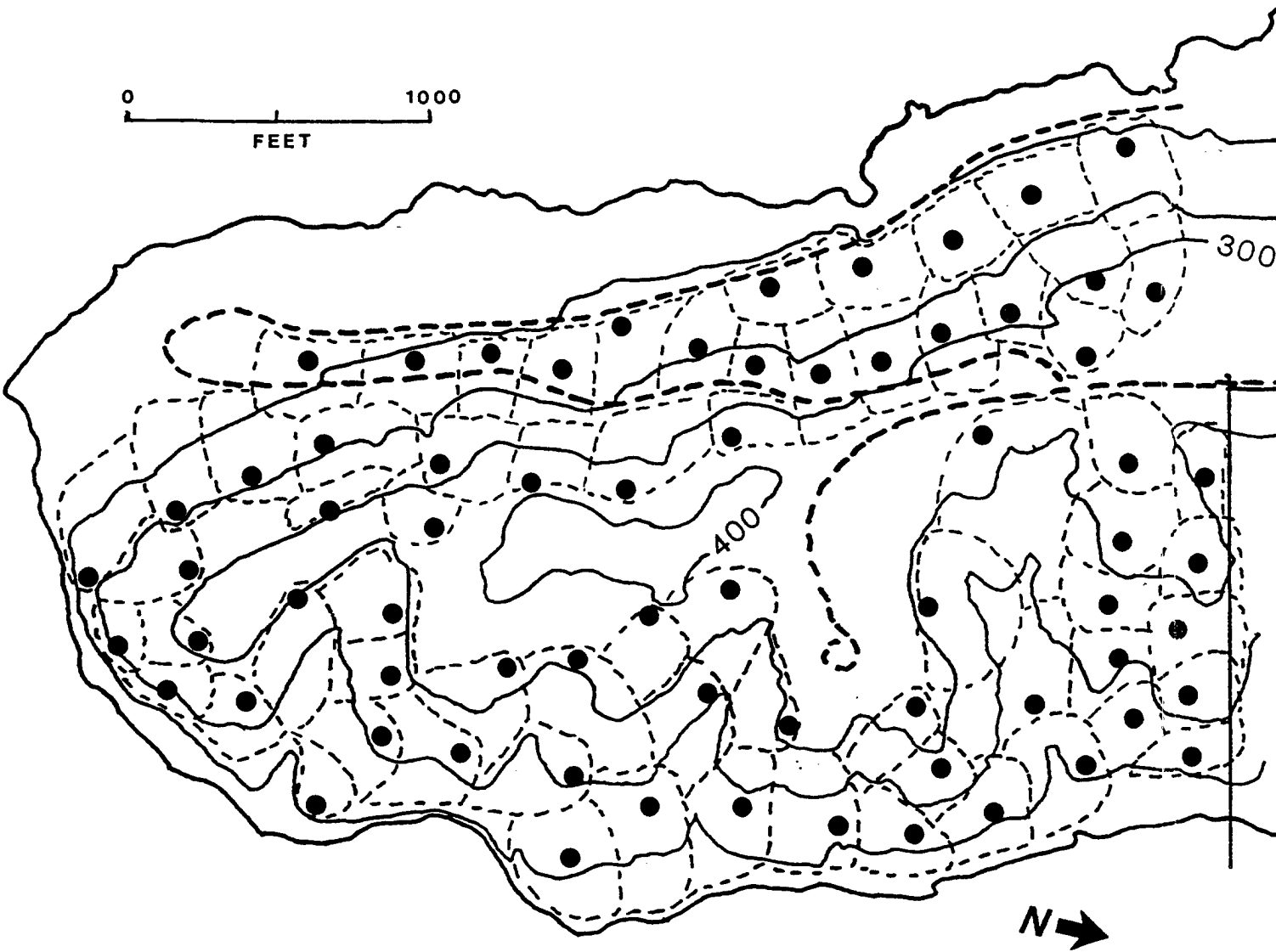


Figure 3. Survey unit one. Dots indicate locations of observation points within areas of native vegetation. Fine dashed lines show approximate areas surveyed from the respective points. Heavy dashed lines are major roads. Contours are in feet.

PACIFIC OCEAN



SAN DIEGO BAY

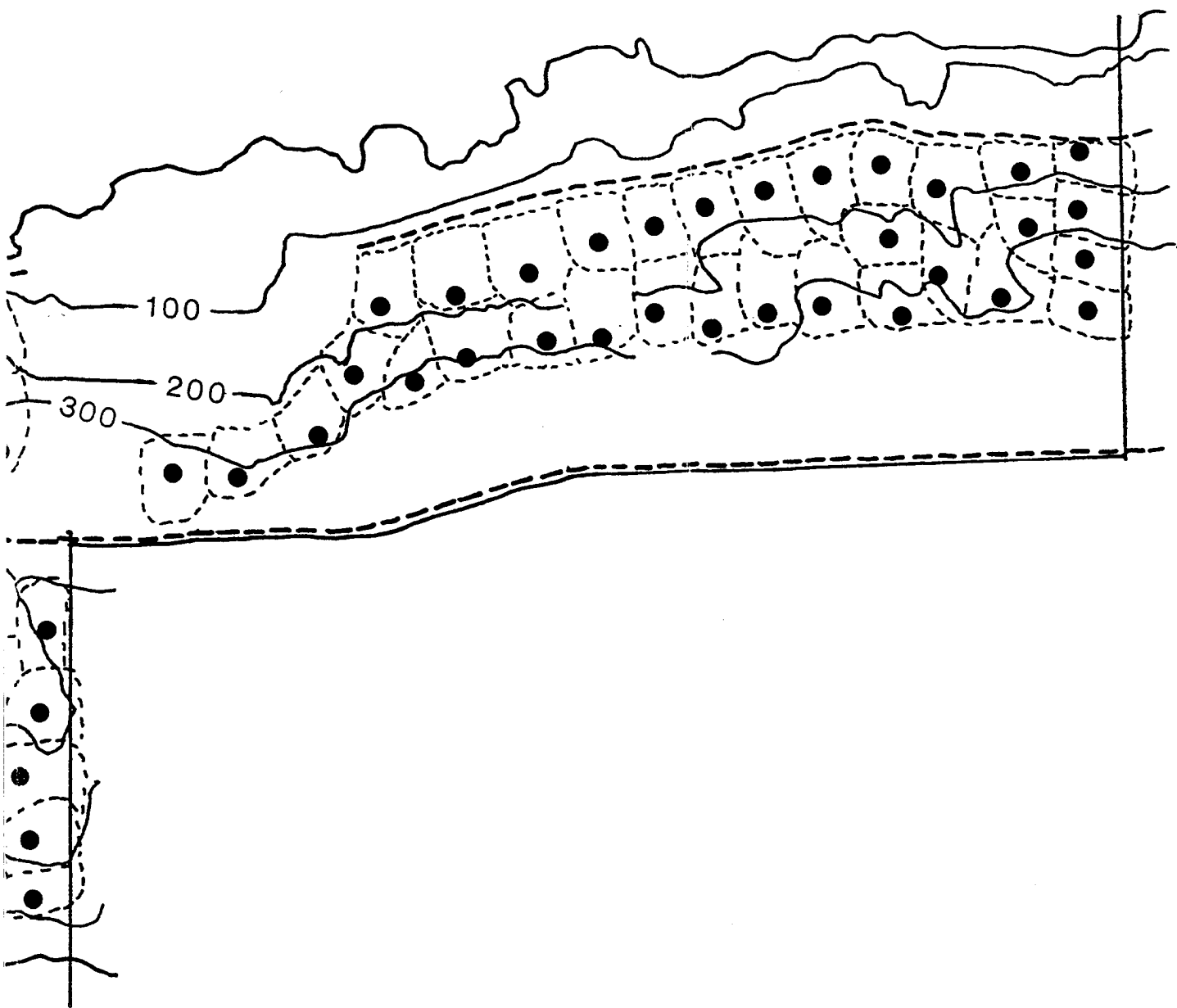
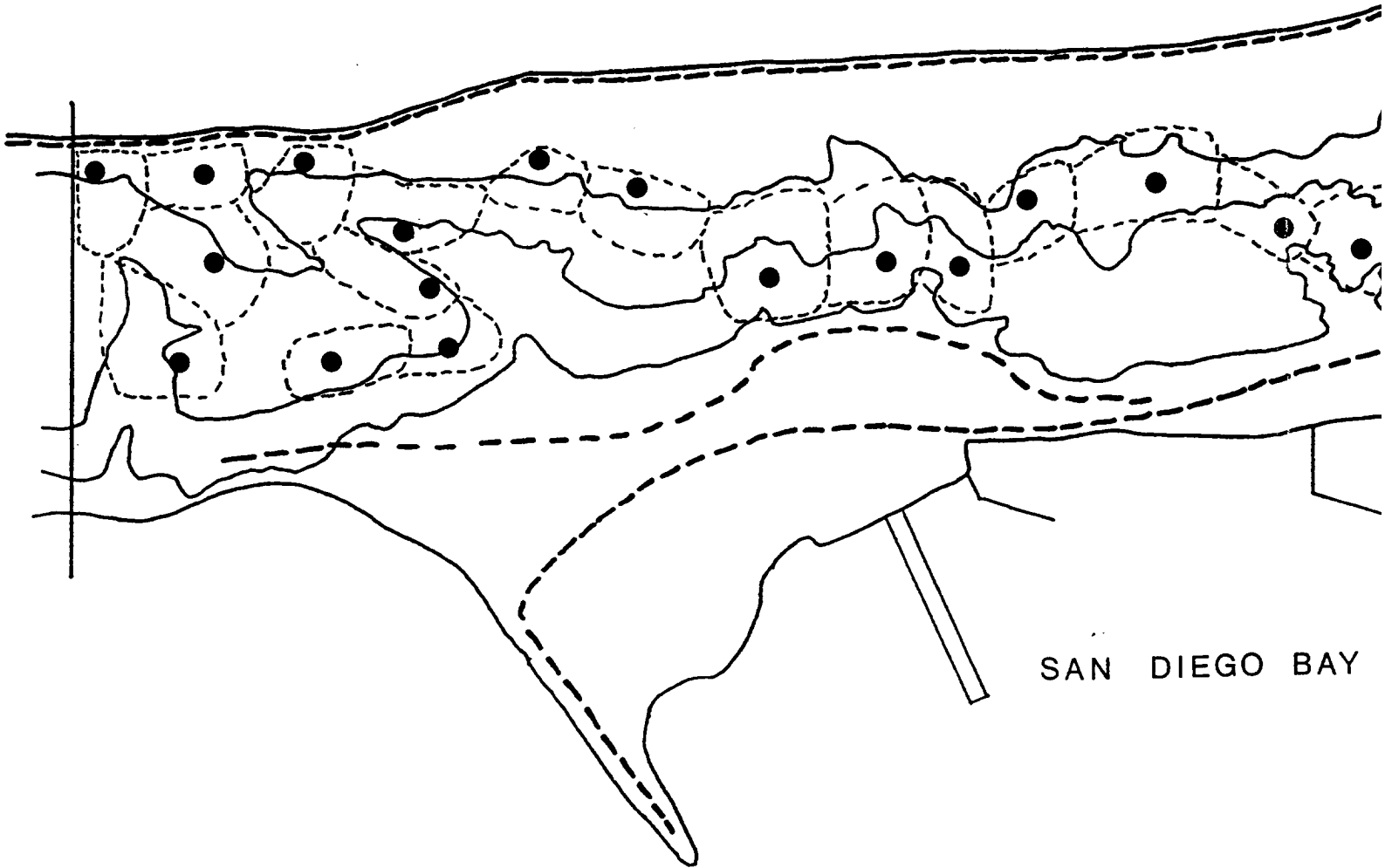


Figure 4. Survey unit two. Dots indicate locations of observation points within areas of native vegetation. Fine dashed lines show approximate areas surveyed from the respective points. Heavy dashed lines are major roads. Contours are in feet.



SAN DIEGO BAY

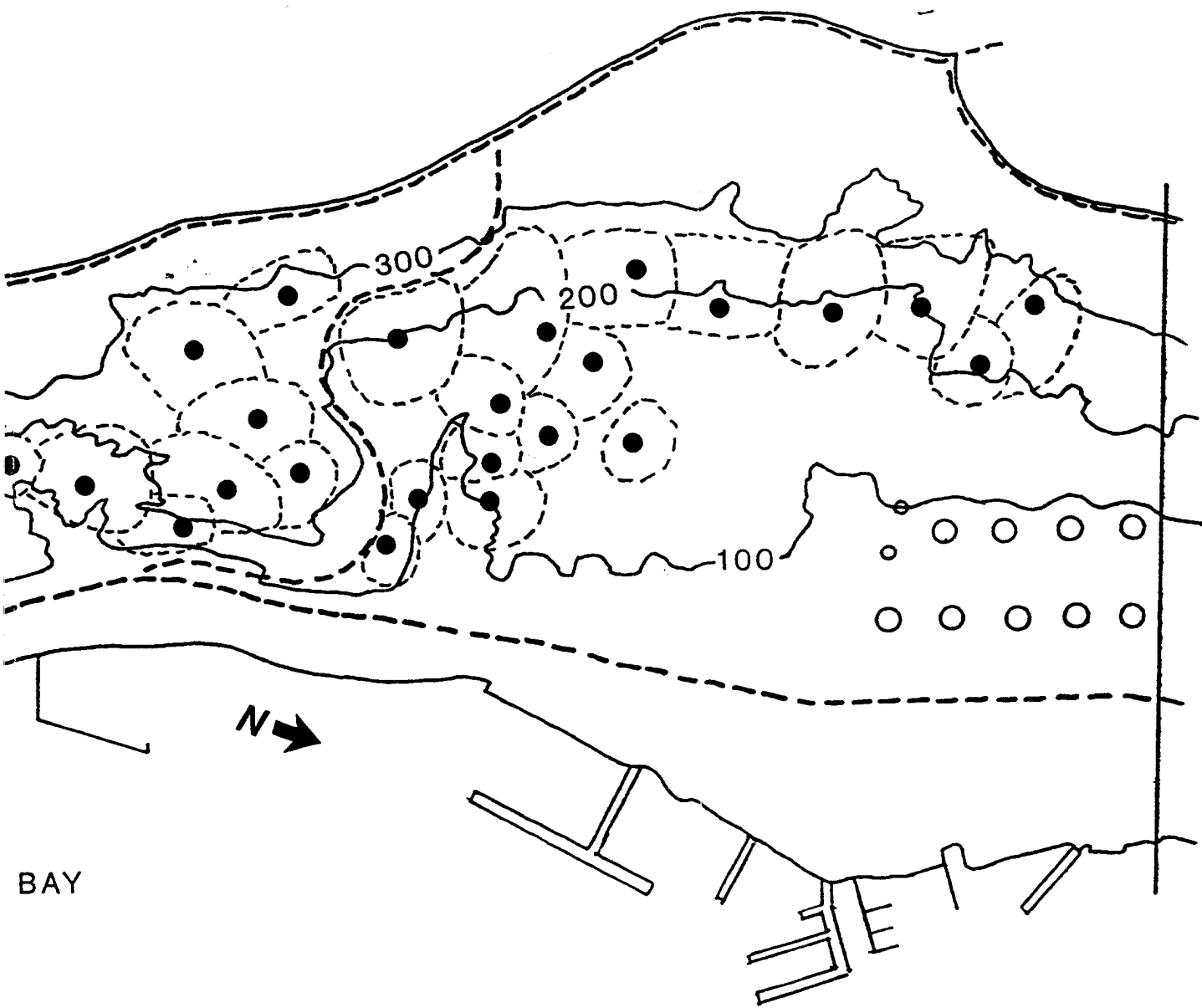
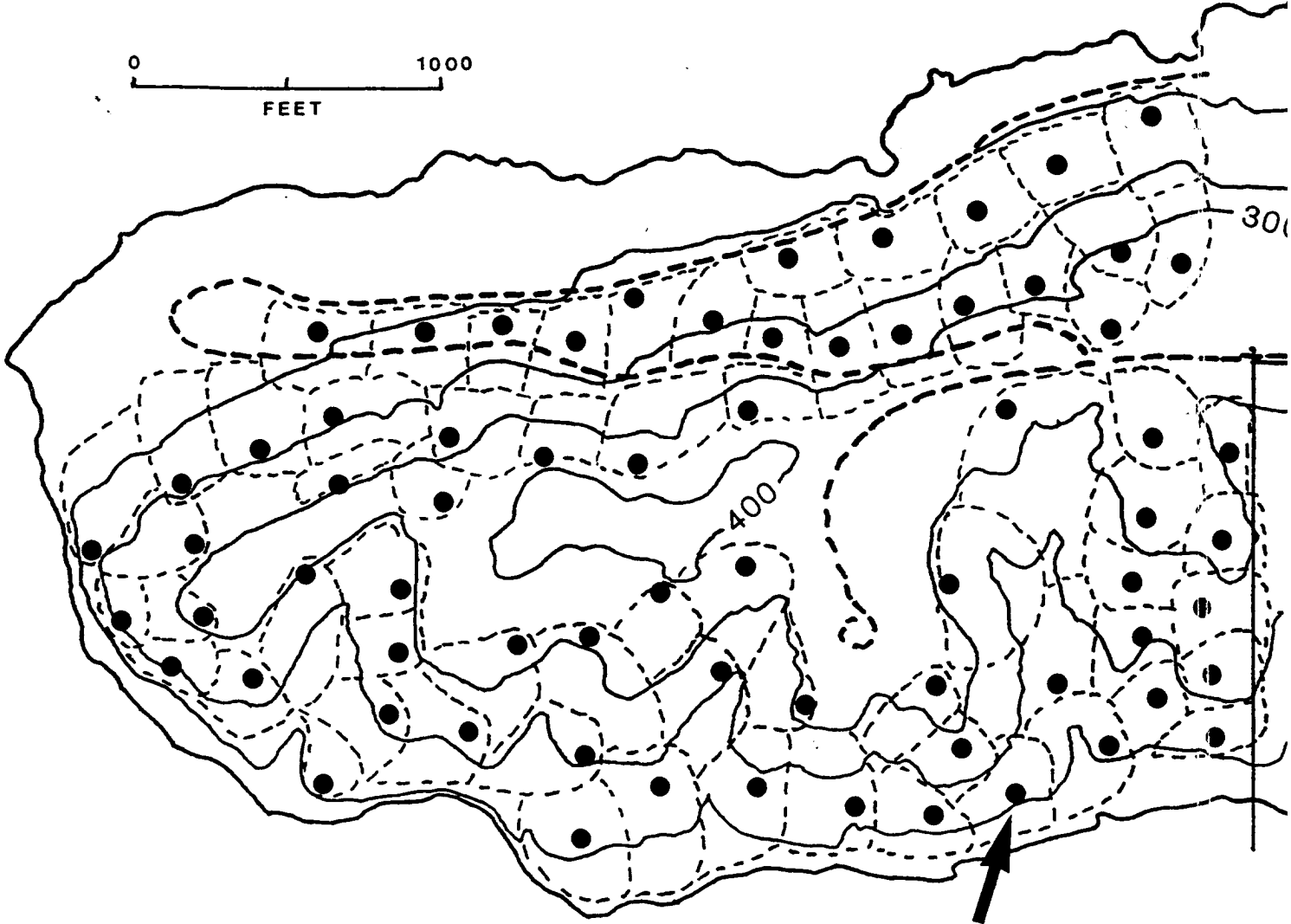


Figure 5. Survey unit three. Dots indicate locations of observation points within areas of native vegetation. Fine dashed lines show approximate areas surveyed from the respective points. Heavy dashed lines are major roads. Contours are in feet.

PACIFIC OCEAN



SAN DIEGO BAY

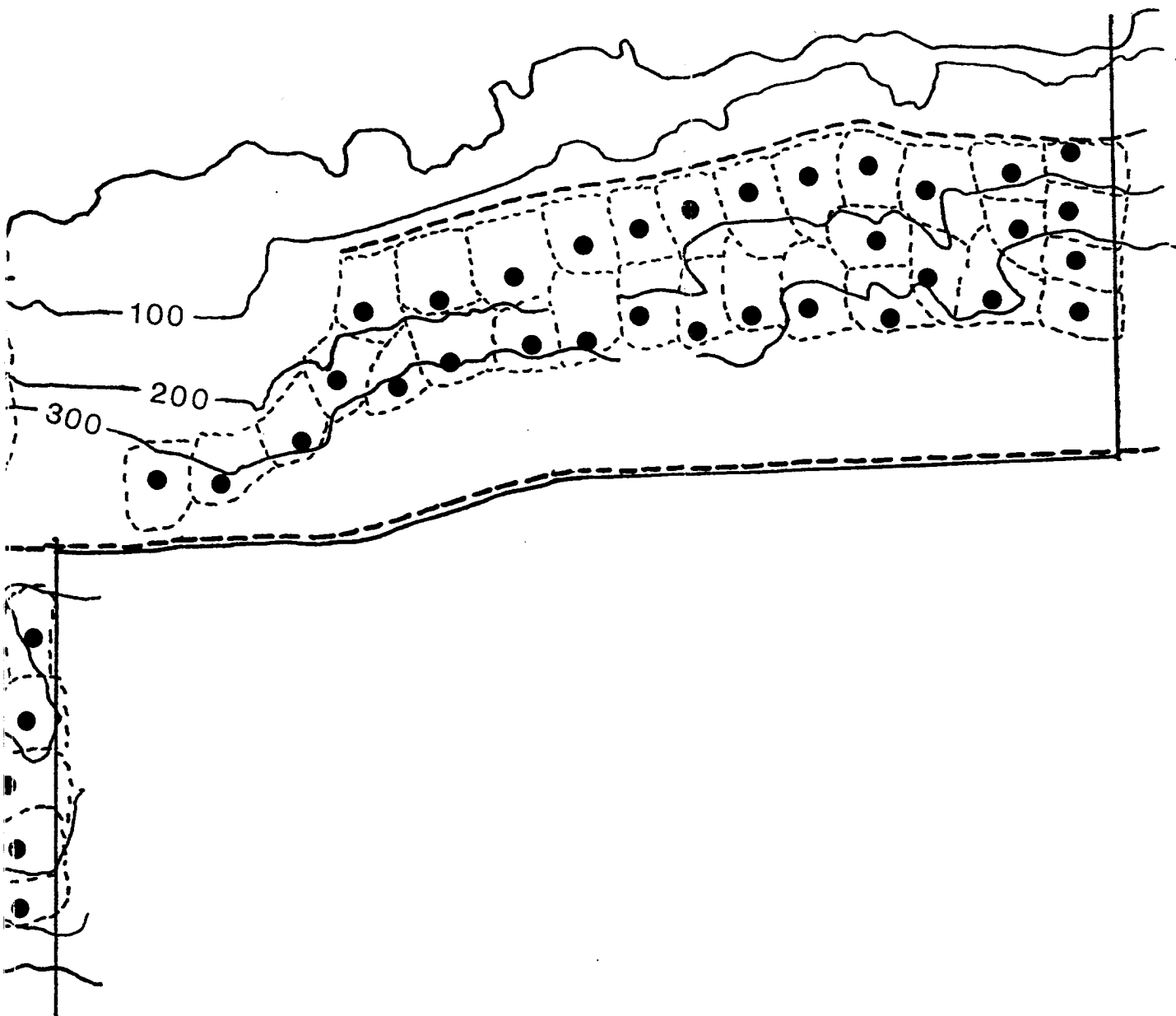


Figure 6. Survey Unit Two, with arrow indicating the location of the only California Gnatcatcher observed during the surveys. The bird was seen on 25 February 1993 by A.M. Rea.

specific references to California gnatcatchers on Point Loma. In addition, we examined available unpublished reports from previous biological inventories of Point Loma and other materials such as checklists.

In order to verify reports based on specimens, and to look for additional records, we visited or queried major California natural history museums to examine specimens and related data first-hand. These museums included the California Academy of Science, The Los Angeles County Natural History Museum, the San Diego Natural History Museum, the Museum of Vertebrate Zoology at U.C. Berkeley, and the Western Foundation of Vertebrate Zoology.

Recent Reports

Having heard about several reports of California gnatcatchers on Point Loma, we attempted to contact the individuals who made the observations and obtain information on the details of the sightings. Having obtained these details, we analyzed the information to verify or assess its validity.

In addition, we contacted a group of highly knowledgeable and skilled field ornithologists, all of whom have had many years of experience observing birds on Point Loma. We asked for details on the amount of time spent on the Point, and any knowledge they might have or know of regarding California gnatcatcher occurrence there.

RESULTS

Field Surveys

We completed six full surveys of the areas of native vegetation on Point Loma in 1993. The survey dates were 25 February, 5 March, 11 March, 12 April, 29 April, and 6 May. As

previously noted, we usually surveyed all three units on the same day. The exception to this was the last survey, when we surveyed unit 2 on 7 May. During all surveys weather conditions were mild and highly conducive to effective observation (Appendix A). We established a total of 201 observation points within the three survey units: 64 points in unit 1, 101 points in unit 2, and 40 points in unit 3 (Figures 3, 4, & 5). We spent 61.5 hours listening and observing from our observation points, and 83.7 hours while transiting between observation points.

One California gnatcatcher was observed during the course of our surveys. It was seen on 25 February by A.M. Rea within the boundaries of the Cabrillo National Monument (Figure 6). The following are field notes on this sighting:

11:47 - 1 California gnatcatcher in *Ceanothus*, all grays rather dusky warm, not clean gray; no obvious white eye-ring - very little white on tail - narrow outer web only, as far as I can tell; can't really see any tail tipping. Breast not white, and not contrasting sharply with rest of body in side views. Watched until 12:02.

We suspect that this bird was a juvenile male, probably in the process of dispersing from its natal area. Although it was carefully searched for, we never located this bird on subsequent surveys.

We recorded 84 species of birds during the surveys (Appendix B). Other than the California gnatcatcher, we observed the following sensitive species:

California brown pelican (*Pelecanus occidentalis*). A state and federal endangered species, brown pelicans are common residents of San Diego Bay and waters around Point Loma. They

also roost at several locations on the west coast of the Point. We recorded these birds on several occasions as they flew along the west shore.

peregrine falcon (*Falco peregrinus*). This state and federal endangered species formerly bred on the steep cliffs at the tip of Point Loma (Unitt 1984). In recent years, young captive-bred peregrines have been released at this site. We recorded several sightings of this species near the southern end of the Point (Appendix B).

rufous-crowned sparrow. (*Aimophila ruficeps*). This federal candidate 2 species is known to breed on Point Loma (Unitt 1984). Two previous survey efforts (ASI 1993, Woodward-Clyde 1981) did not record sightings of this species. Rufous-crowned sparrows occur on Point Loma in the area of short, sparse maritime sage scrub and southern coastal bluff scrub just south of the whale observation station near the old lighthouse. They also occupy the lowest terrace (with similar vegetation) along the east side of the Point from the very tip north to the boundary between Navy and National Monument property. We recorded them on several occasions (Appendix B) estimate the current population to consist of about ten pairs.

Historical records

The only specific published reports of California gnatcatchers on Point Loma that we were able to locate were those of Atwood (1980) and Unitt (1984). Unitt's report is in the form of a point on a map of San Diego County, indicating a historic breeding locality. This report is based on a set of eggs and accompanying data card in the collection of the Western Foundation of Vertebrate Zoology (WFVZ).

In his comprehensive review and analysis of California gnatcatcher distribution and status, Atwood (1980) referenced the same WFVZ nest record, and also supported the record with a reference to the Museum of Vertebrate Zoology (MVZ) at the University of California, Berkeley.

We visited the WFVZ to examine the eggs, nest, and associated record card. Lloyd Kiff, director and curator of the WFVZ, verified the identity of the eggs. The set was collected on 24 March 1915 by A.M. Ingersoll, a noted egg collector of the period. A photocopy of the record card is provided in Figure 7. The species is identified as Black-tailed gnatcatcher, the accepted common name at the time.

We also visited the MVZ to determine the source of the reference cited by Atwood. Here we found nine study skins of California gnatcatchers collected from Point Loma in 1908 by Frank Stephens, the first curator of birds for the San Diego Society of Natural History. Table 1 provides the specimen label data from these specimens.

These eggs, nest, and study skins are the only unequivocally documented records of the California gnatcatcher for Point Loma. However, determining the exact location where these specimens were collected can not now be determined. This problem, and its implications, is addressed in greater detail in the discussion section of this report.

Recent Reports

During our investigations we received three reports of recent California gnatcatcher sightings on Point Loma, one from Vince Scheidt and two from Rod Dossey.

Zoological Collection of A. M. INGERSOLL 3023

No. 753 Species *Polioptila californica*
 Set Mark 2338 Black-tailed Gnatcatcher
 Locality Pt. Loma - San Diego, Cal.
 Date March 24, 1915 Incubation begun
 No. of Eggs 4 Collected by A. M. Ingersoll
 Remarks Nest taken. Placed 2 feet from ground
 in thicket of low bushes. Nest with 4 young, banded
 Green-tail was in a sapling at a distance of about
 sixty feet.

Figure 7. Photocopy of egg record card accompanying the set of California Gnatcatcher eggs from Point Loma. The specimens are in the collection of the Western Foundation of Vertebrate Zoology, Camarillo, California.

Table 1. Specimen label data from California Gnatcatcher study skins from Point Loma in the collection of the Museum of Vertebrate Zoology.

MVZ #	Sex	Collection Date
3506	M	10 April 1908
3507	F	10 April 1908
3508	M	14 April 1908
3509	F	14 April 1908
3510	F	17 June 1908
3511	M	18 June 1908
3512	F	18 June 1908
3513	M	20 June 1908
3514	M	20 June 1908

We contacted Vince Scheidt by telephone on 13 May 1993, and he provided the following details: He was conducting botanical surveys along the lower west side of the Point in 1990, as part of a revegetation study for areas affected by the City of San Diego's Sludge Pipeline Project. At about 0830 on the morning of 21 August he was in an area of native vegetation near the extreme southwest corner of property controlled by the Fleet Combat Training Center Pacific. This area is mostly level, covered with undisturbed high-quality native vegetation. The dominant plant species in this area are coastal sagebrush (*Artemisia californica*) cliff spurge (*Euphorbia misera*) and California encelia (*Encelia californica*).

He reported seeing two birds that were calling and interacting with each other. He was by himself at the time, and was not carrying binoculars. He nevertheless approached the birds, following them through the brush until he was satisfied of his identification by means of call, behavior, and plumage. Viewing conditions were excellent. At the time, he did not regard this as an unusual sighting. He was unfamiliar with the resident bird life of the Point and was not surprised to see the species in this apparently highly suitable habitat. He continued with his botanical work, but on subsequent visits spanning several months he was unable to relocate the birds and reported no other sightings.

Rod Dossey was a student working for Mary Platter-Rieger (NRaD) during 1992. On 13 August he reported a gnatcatcher sighting near Ashburn Road on the Submarine Base. When he reported the sighting to Platter-Rieger, she instructed him to write a memo including the details of the sighting. He also reported another sighting on 16 September 1992 (his report gave the date as 16 Sep 93, an obvious *lapsus*), and prepared a brief summary of the details.

At the time we prepared this report, Mr. Dossey was unavailable for an interview regarding his sightings. In lieu of that, his original reports are presented in their entirety as Appendix C.

For many years, Point Loma has attracted birdwatchers because of its reputation as a major migratory waypoint and its tendency to attract avian waifs (also called vagrants). Most often these waifs are attracted to ornamental vegetation at the Cabrillo National Monument and in Fort Rosecrans National Cemetery. Numerous skilled field ornithologists have (for at least 25 years) intensely surveyed those areas on Point Loma that are open to the public.

Although most of the areas of interest to birdwatchers do not consist of habitat likely to contain California gnatcatchers, most are surrounded by apparent high-quality vegetation suitable for gnatcatchers. If California gnatcatchers were present in these adjacent areas, they would certainly have been detected at some point in time.

Both Unitt and Everett have personal field notes from Point Loma extending back to the mid 1970s. We reviewed these notes and found no records of California gnatcatchers. In addition, we interviewed several prominent local observers who have extensive experience on Point Loma. These included Elizabeth Copper (20 years), Richard Webster (20 years), and Guy McCaskie (25+) years. None of these observers have recorded or know of any valid reports of California gnatcatchers on Point Loma.

Another local observer we interviewed, with unique experience on Point Loma, is Claude G. Edwards. Since the mid-1970s he has dedicated himself to observing, recording, and documenting bird occurrences on the Point. A professional biologist, he has for the last 10 years led monthly nature walks

through the Cabrillo National Monument, including the native scrub there, in addition to conducting his extensive personal observations. He has prepared and published several revisions of a checklist of birds of the monument and of Point Loma (Edwards 1988). He has no record of any sightings of California gnatcatchers on Point Loma.

DISCUSSION

Field surveys

It is clear from our surveys that California gnatcatchers do not currently occupy Point Loma. The one sighting of the species, and its absence thereafter, suggests that it is a very rare transient, occurring during the post-breeding dispersal period for juveniles.

Historical records

The historical records provided by the eggshell and study skin specimens are the only irrefutable evidence that California gnatcatchers ever occurred on Point Loma. There is, however, a problem interpreting these records in the context of current and future habitat management requirements for government property on the Point.

The difficulty is that none of the specimens have more precise location data than "Point Loma". At the time when they were collected, there was very little development on the Point. It is likely that relatively undisturbed vegetation extended most of the way from the tip of Point Loma to near Mission Bay, far beyond the current boundaries of government property. We know of no specific data or descriptions of vegetation or habitat in the area at the time. Nevertheless, it seems reasonable to assume that the vegetation and habitat throughout the Point at the time

was similar to other areas of coastal San Diego County containing extensive stands of coastal sage scrub.

We found further evidence to support this in the form of three specimens of sage sparrows (*Amphispiza belli*) in the collection of the San Diego Natural History Museum. The specimens were collected in "Ocean Beach" in 1913 by Laurence Huey. This is significant because Sage Sparrows are sedentary species which have a strong affinity for the vegetation type also favored by California gnatcatchers. These specimens clearly indicate the historic presence of this habitat type.

We cannot, of course, rule out the possibility that the California gnatcatcher specimens were collected on property currently managed by the government. The only inference that can be drawn from existing information is that California gnatcatchers occurred historically *somewhere* on Point Loma, but the population was extirpated between 1913 and 1965, about the time when experienced observers began recording observations on the Point.

Recent Reports

The most interesting recent report is that of Vince Scheidt, a local biologist with previous experience observing gnatcatchers. In assessing the identification of the birds he observed on 21 August 1990, we have weighed a variety of both positive and negative factors. The negative factors are as follows:

At the time of his observations he did not record those characteristics that led him to the conclusion he was looking at California gnatcatchers, *i.e.*, a detailed description of the birds' plumage, vocalizations, or behavior. He did not have

binoculars, and was alone at the time. He did not see the birds subsequently, nor did any other observer. Were this report submitted to the California Bird Records Committee of the Western Field Ornithologists (WFO), it would almost certainly be rejected on the basis of insufficient information (G. McCaskie, pers. comm.).

Nevertheless, Scheidt was aware and astute enough to recognize at the outset that he was possibly seeing California gnatcatchers on Point Loma, to the degree that he stopped what he was doing to pursue the birds and attempted to verify their identity. The fact that he did not record his observations in greater detail is mitigated by his recognition that the habitat appeared very suitable for California gnatcatchers and his logical conclusion that the species would not necessarily be exceptional or unexpected there.

None of the information he provided to us ruled out the validity of his identification. The late August date coincides with the dispersal period for juvenile California gnatcatchers, suggesting that if correctly identified, the birds could have been offspring produced by breeding pairs elsewhere within the species' range. The blue-gray gnatcatcher (*Polioptila caerulea*), easily confused with the California gnatcatcher by the inexperienced, occurs in small numbers in winter on Point Loma, but its earliest known arrival date in coastal San Diego County is 4 September 1977 in the Tijuana River Valley (Unitt 1984).

We have no reasons not to accept the validity of this record, but we cannot independently verify it either. The most significant fact is that even if they were correctly identified, the birds did not remain in the area.

The reports by Rod Dossey are more equivocal. His

and "hard chaparral" plant communities. Our field observations of California gnatcatchers elsewhere suggest that this distinction is meaningful for describing the habitat as it currently exists on Point Loma. The primary difference between these two types is structural. Soft chaparral generally consists of low-statured plants 2 to 4 feet tall with relatively open canopies, spaced sparsely enough to allow the intermittent occurrence of forbs, grasses and occasional succulents. Hard chaparral is extremely dense, usually ranges from 4 to 8 feet tall, and has a thick, closed canopy.

On Point Loma, the dominant plant species in soft chaparral are coastal sagebrush (*Artemisia californica*), California encelia (*Encelia californica*), cliff spurge (*Euphorbia misera*), and coastal deer weed (*Lotus scoparius* spp. *scoparius*) (Figure 8). Hard chaparral is dominated by chamise (*Adenostoma fasciculatum*), lemonadeberry (*Rhus integrifolia*), flat-topped buckwheat (*Eriogonum fasciculatum*), wart-stemmed ceanothus (*Ceanothus verrucosus*), and mission manzanita (*Xylococcus bicolor*) (Figure 9).

An analysis of the vegetation of Point Loma was recently completed by Advanced Sciences, Inc. (ASI 1993). This study included detailed vegetation mapping on a scale much finer than necessary or appropriate to defining habitat suitability for California gnatcatchers. During our 29 April survey we plotted areas of soft and hard chaparral on 11 X 17 inch maps (Figures 10, 11, & 12). Soft chaparral includes areas that we believe are highly suitable as nesting and foraging habitat for California gnatcatchers. Hard chaparral could be used occasionally as foraging habitat, or as dispersal corridors, but is unlikely to be suitable as nesting habitat. There is a high degree of correlation between what we designate as soft chaparral and what the ASI maps show as maritime sage scrub, and what we indicate as

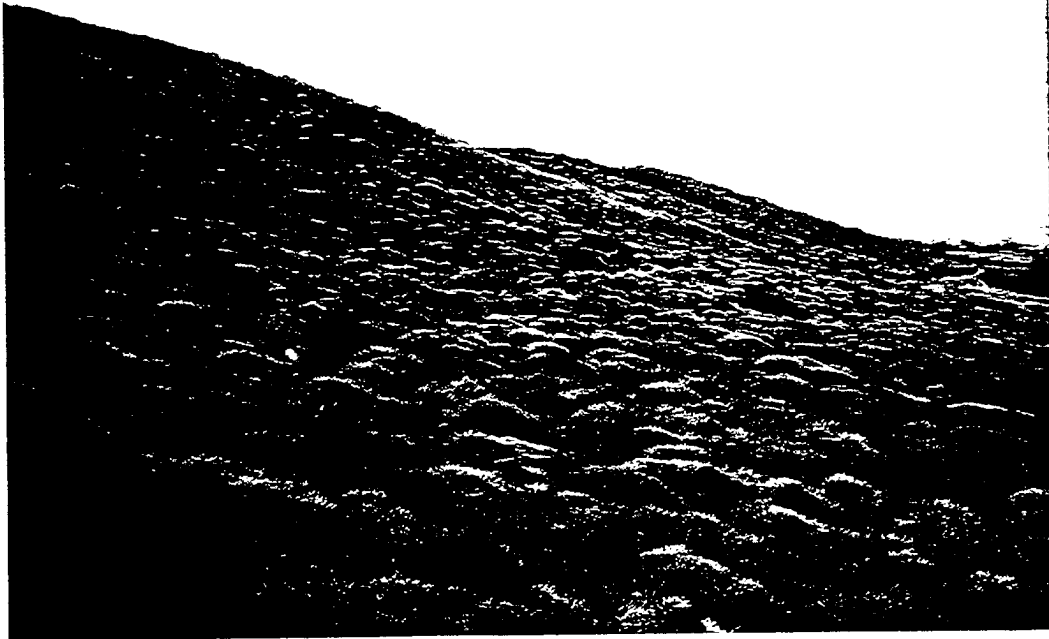
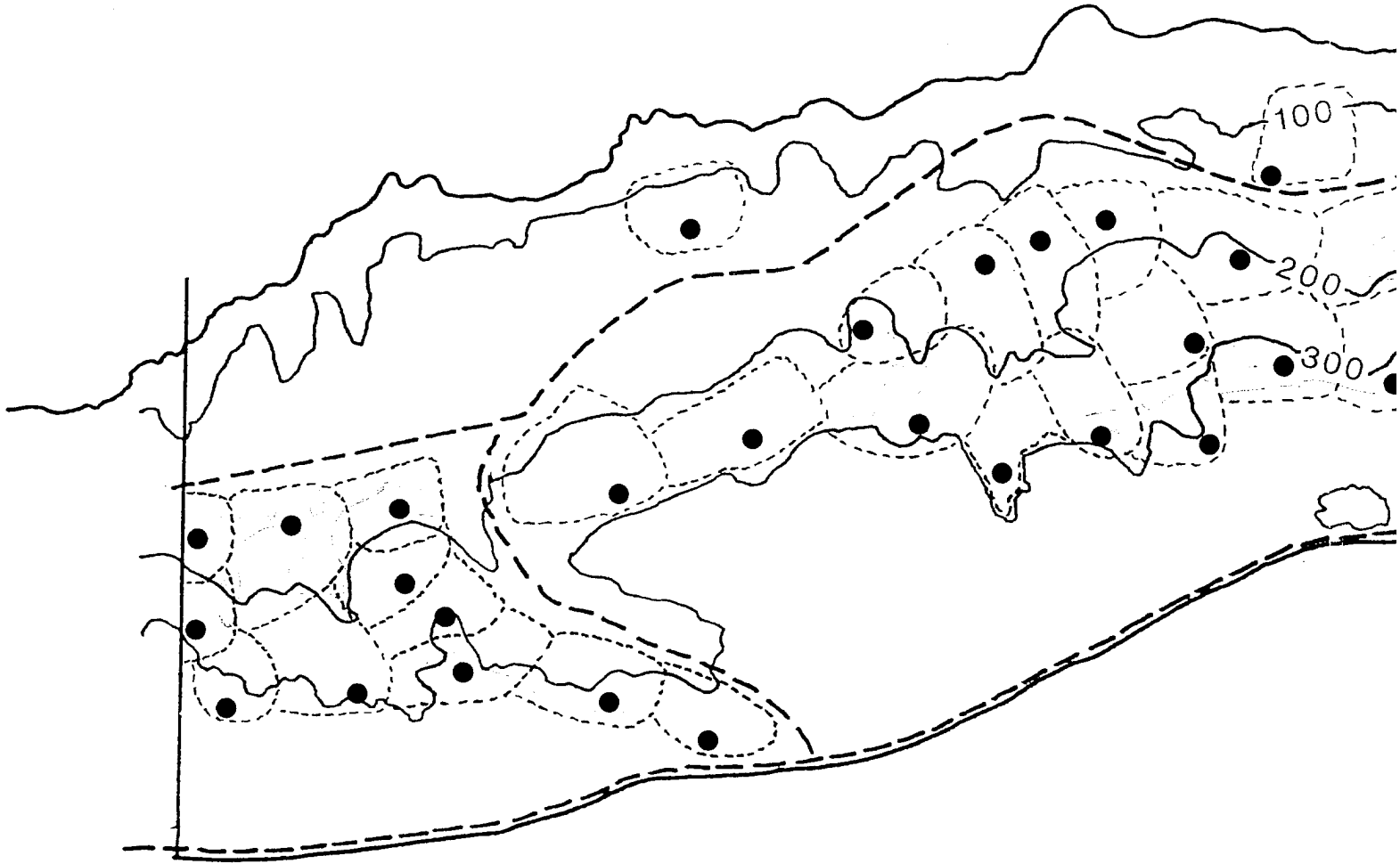


Figure 8. Photograph of typical stand of soft chaparral on Point Loma. Photograph was taken on the west side of the Point, looking south from the extreme northern boundary of government property. Photograph by W.T. Everett.



Figure 9. Photograph of typical stand of hard chaparral on Point Loma. Photograph was taken looking west from State Route 209, about one-half mile south of the entrance to government property. Photograph by W.T. Everett.

PACIFIC OCEAN



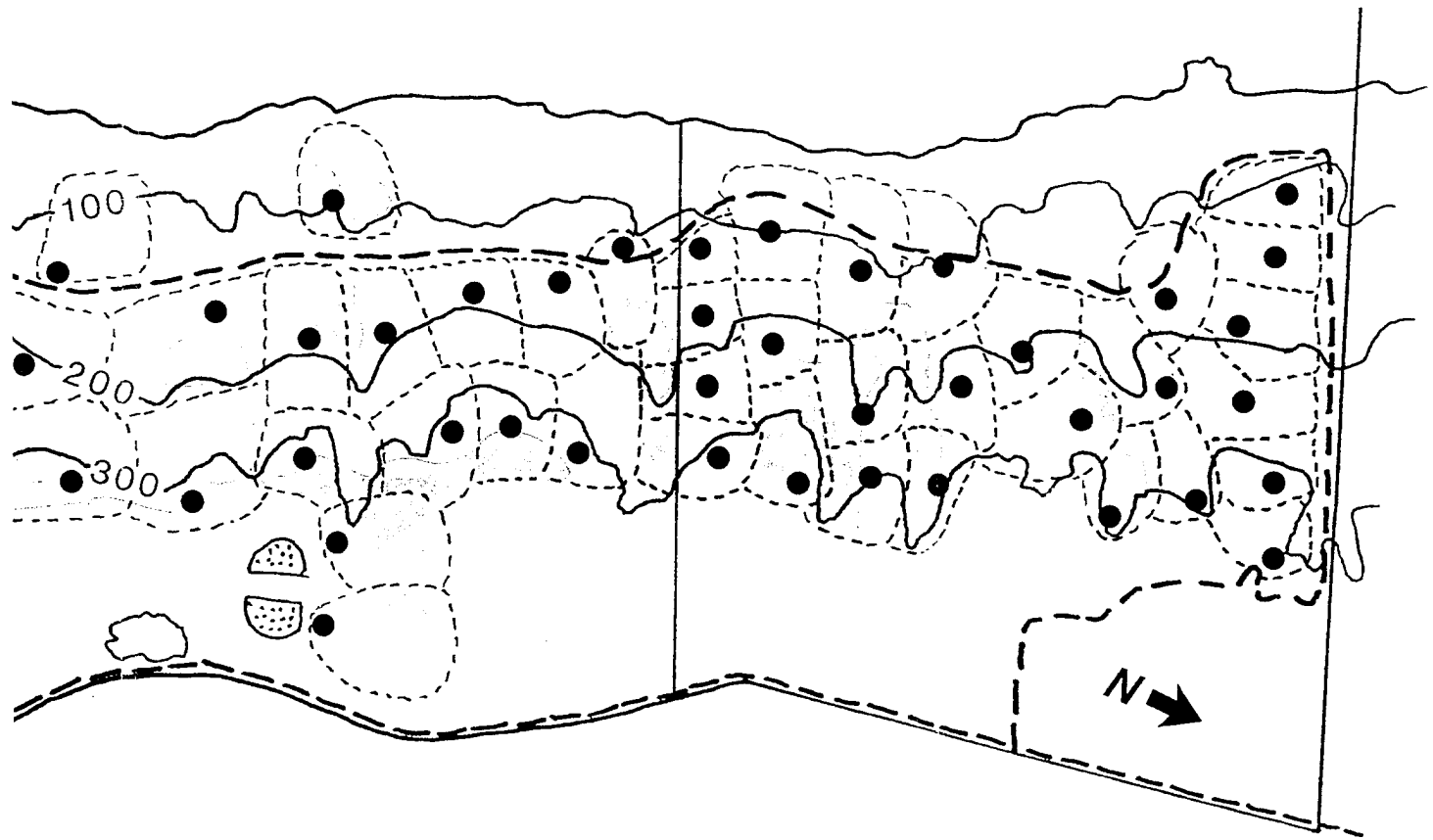
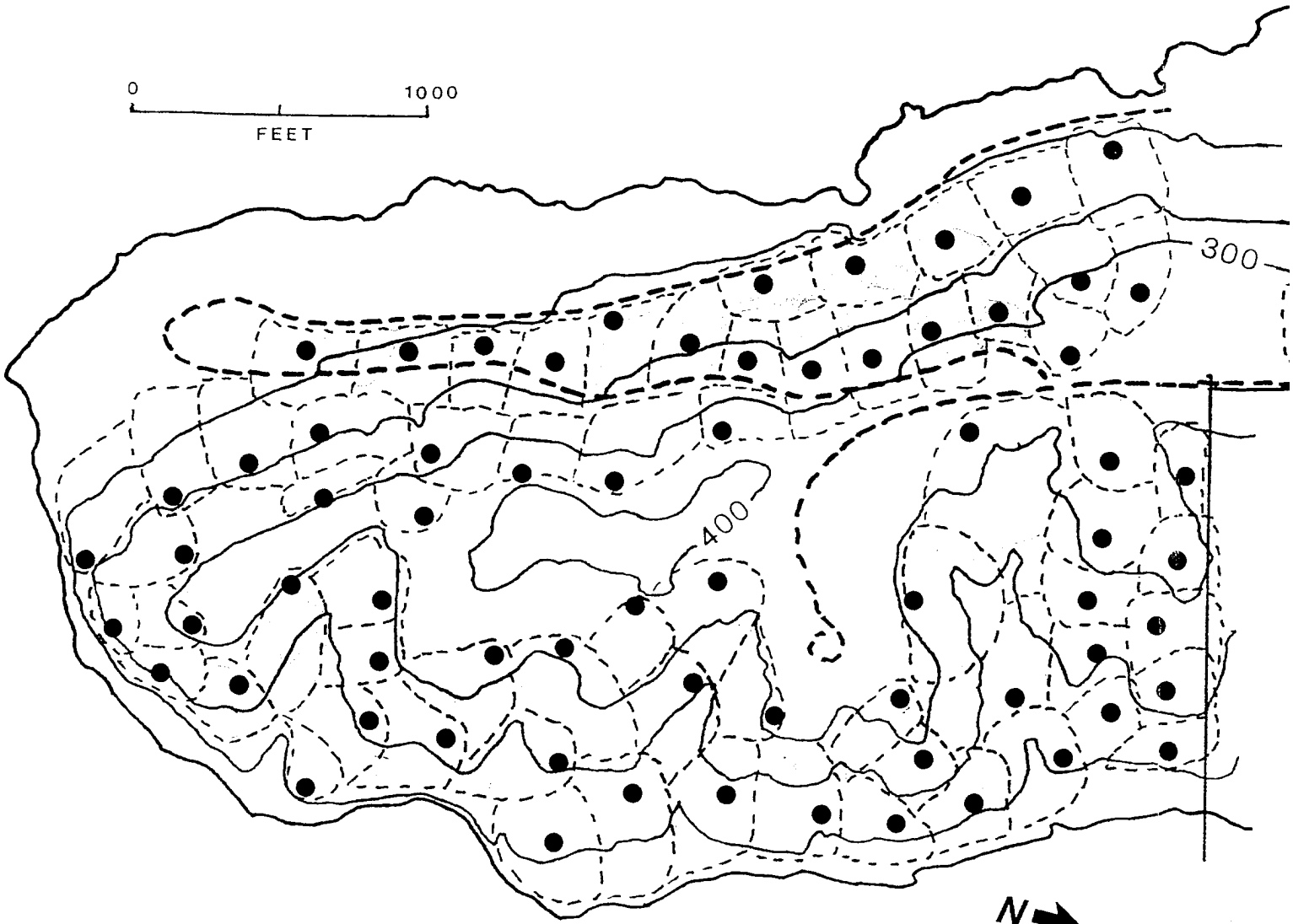


Figure 10. Survey unit one. Areas in green indicate approximate tracts of native vegetation designated as soft chaparral. Areas in orange are considered hard chaparral.

PACIFIC OCEAN



SAN DIEGO BAY

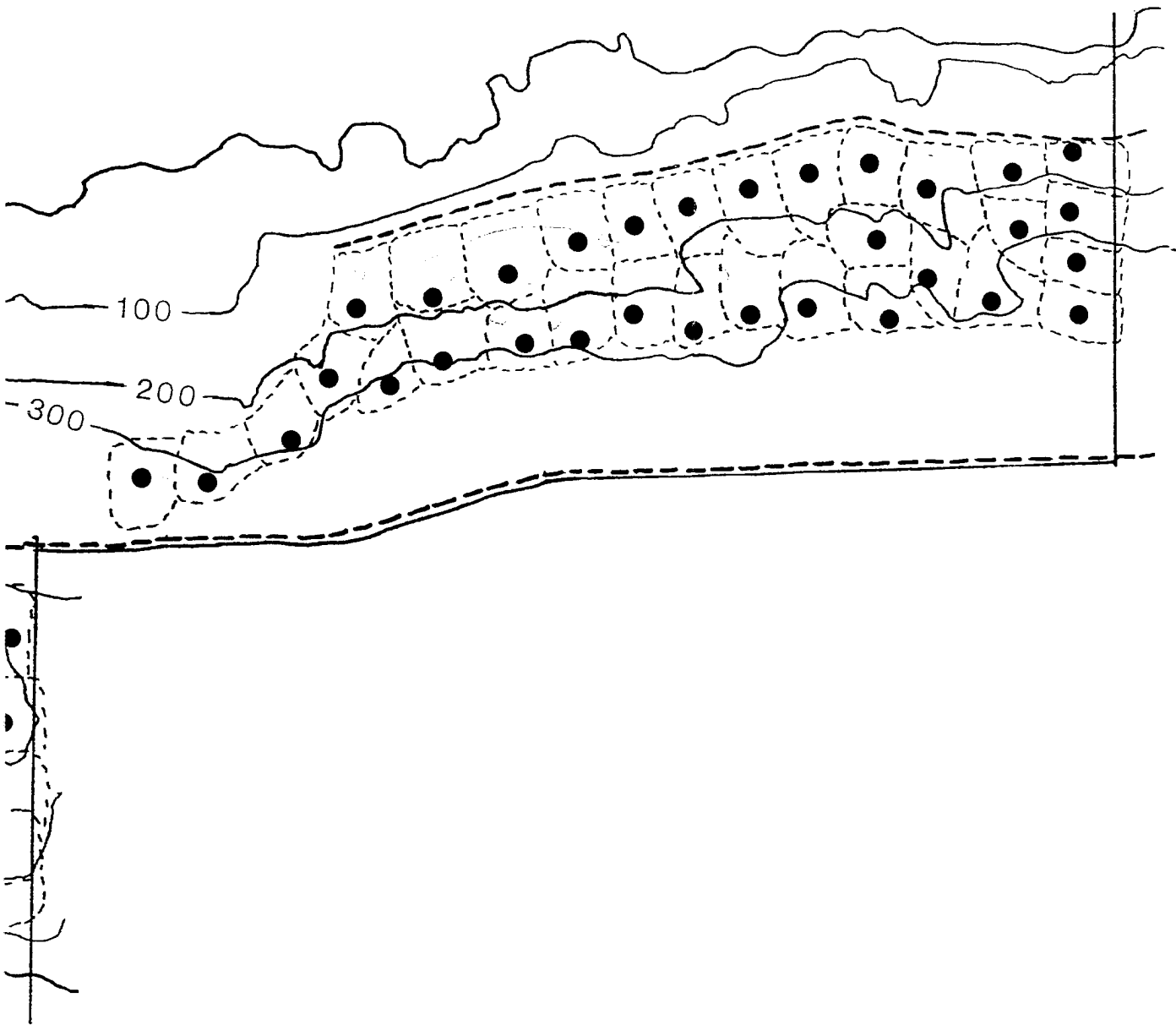
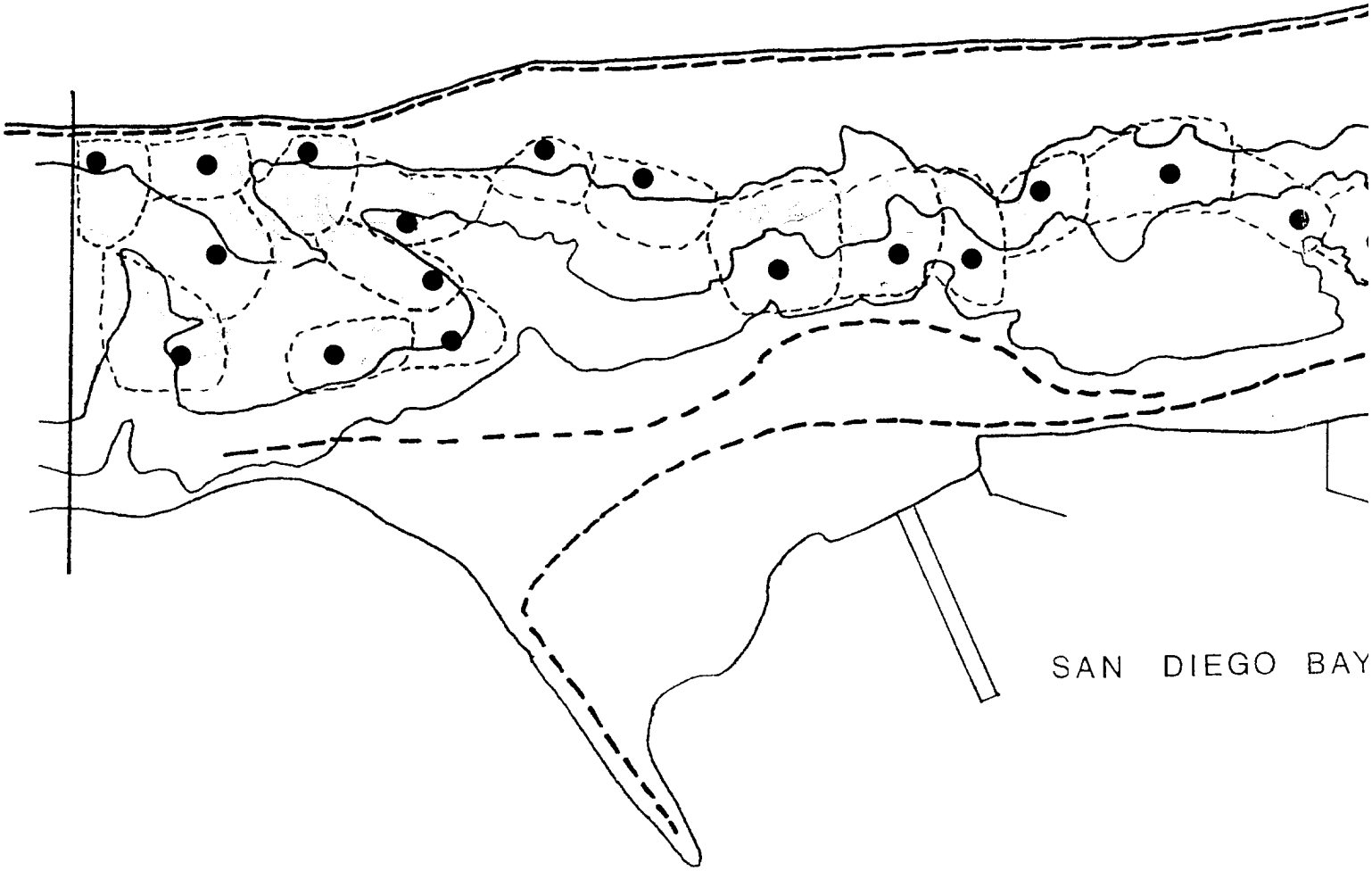


Figure 11. Survey unit two. Areas in green indicate approximate tracts of native vegetation designated as soft chaparral. Areas in orange are considered hard chaparral.



SAN DIEGO BAY

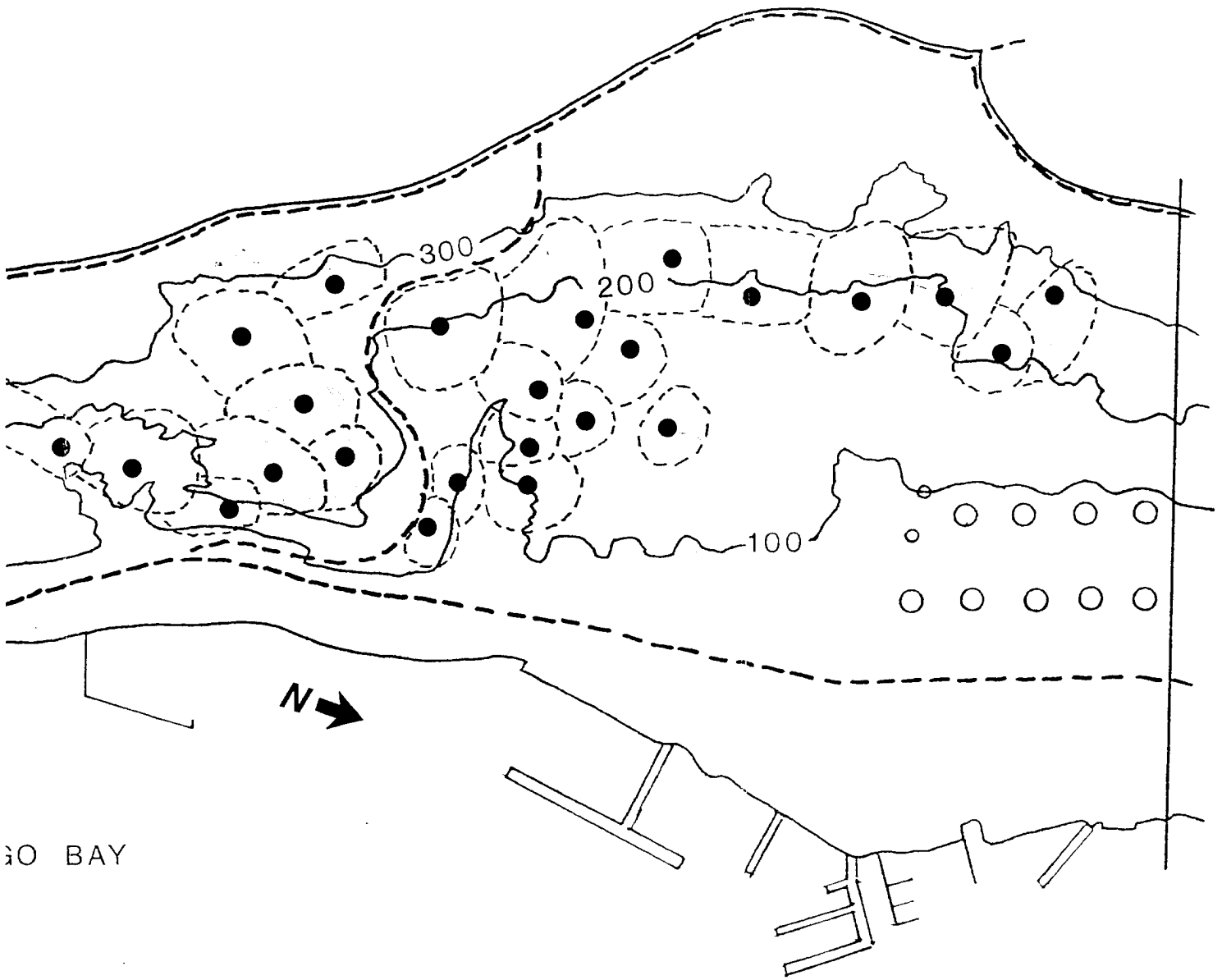


Figure 12. Survey unit three. Areas in green indicate approximate tracts of native vegetation designated as soft chaparral. Areas in orange are considered hard chaparral.

hard chaparral and what ASI showed as the southern maritime chaparral.

Although there are extensive stands of soft chaparral on Point Loma, we are at a loss to explain why California gnatcatchers are not resident. The habitat appears suitable, but a variety of other factors could preclude their presence. The most obvious explanation is the habitat's isolation, precluding normal population dispersal and recruitment (Soule et al. 1988). Consistent onshore wind, noise, or even high levels of atmospheric moisture could preclude persistence of a California gnatcatcher population. Perhaps the plant community structure requires periodic fire to create suitable conditions (O'Leary 1988). No significant fire has burned on Point Loma for over 90 years (H. Overton, National Park Service, pers. comm.).

We observed a curious ornithological anomaly on Point Loma that also could explain the absence of a California gnatcatcher breeding population. We noted the high density of song sparrows (*Melospiza melodia*) in soft chaparral throughout the Point. In coastal southern California, this species is usually uncommon away from its preferred riparian habitat. The only other location we have seen such extensive occupation of chaparral by this species is on Santa Cruz Island. Perhaps isolation has somehow enabled song sparrows to exclude California gnatcatchers on Point Loma.

These are all highly speculative hypotheses offered only for consideration and possible future investigation. Perhaps, in the time since California gnatcatchers were extirpated, there has simply not been sufficient influx of breeding stock to establish and maintain a population. The island-like isolation of the Point (a result of urban development) clearly reduces the likelihood of re-establishment.

CONCLUSIONS

Based on the results of our investigations, we conclude that California gnatcatchers have not occurred on Point Loma with any regularity for at least three decades and perhaps for much longer. The few historical specimen records are valid but leave unanswered questions regarding the exact location on Point Loma where they were collected. None of the recent reports can be independently verified and only one appears credible.

Large areas of apparently suitable habitat for California gnatcatchers remain on Point Loma, but the absence of the species suggests the possibility that some other factor, currently unidentified, precludes their presence at this time.

RECOMMENDATIONS

1. To the greatest extent possible, all areas of soft chaparral on Point Loma should be preserved for future possible occupation by California gnatcatchers, and corridors of hard chaparral should be maintained between these areas.
2. All areas of natural vegetation on Point Loma should be surveyed every three to five years to determine if California gnatcatchers have re-established a population. (If no development of soft chaparral areas takes place during this time period, this may not be necessary). Because California gnatcatchers could become established at any time, any area of native vegetation slated for development should be surveyed again prior to plan approval.
3. Studies currently in progress elsewhere to refine knowledge of habitat preference and use by California gnatcatchers should be reviewed, and, where applicable, these analyses should be applied to re-evaluate habitat on Point Loma.

4. Unless a natural breeding population of California gnatcatchers becomes established on Point Loma or reasons for their absence are better understood, no attempt should be made to introduce the species.

ACKNOWLEDGEMENTS

We appreciate the assistance of C. Edwards, G. McCaskie, R. Webster, E. Copper, V. Scheidt, and M.F. Platter-Rieger, who provided useful unpublished information. H. Overton, D. DeFrain, D. DeFord, and J. Buehler assisted with logistics. This research was funded by the Naval Facilities Engineering Command Agricultural Outlease Program.

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APPENDIX A

Observation Conditions

During Point Loma California Gnatcatcher Surveys

Appendix A - California Gnatcatcher Survey Conditions

Survey date: 25 February 1993

Cloud cover: 90% Wind: 5-8 Kts NW Temperature: 62 F

Visibility, general observation and listening conditions:

Excellent visibility (>1000') and observation conditions. Cloud cover dissipated at mid-day, and wind subsided. Wind and cloud cover returned in the afternoon, but observation conditions remained excellent.

Survey date: 5 March 1993

Cloud cover: 0 % Wind: 0-4 Kts E Temperature: 66 F

Visibility, general observation and listening conditions:

Excellent conditions, unlimited visibility with mild Santa Anna in progress. Temperature rising to 74 F at mid-day. Wind shifted to 4-8 Kts W at 1100.

Survey date: 11 March 1993

Cloud cover: 0 % Wind: 0-3 Kts E Temperature: 62 F

Visibility, general observation and listening conditions:

Very light haze but excellent visibility otherwise. Wind increased to 4-10 Kts W about 1100. High temperature for the day was about 70 F.

Survey date: 12 April 1993

Cloud cover: 100 % Wind: 0-3 Kts W Temperature: 65 F

Visibility, general observation and listening conditions:

High, thin overcast but warming to 70 F in the afternoon. Excellent conditions for observing throughout the day. Wind shifted to 4-10 Kts S at 1030. At 1300 skies cleared.

Survey date: 29 April 1993

Cloud cover: 100 % Wind: 0-3 Kts W Temperature: 67 F

Visibility, general observation and listening conditions:

Excellent conditions throughout the day. Skies cleared at 1300, and wind increased to 8 Kts W. High temperature for the day was about 74 F.

Survey date: 6 May 1993

Cloud cover: 100 % Wind: 0-3 W Temperature: 67 F

Visibility, general observation and listening conditions:

Skies cleared at 1000 and wind increased up to 8 Kts W, with excellent conditions prevailing throughout the day. High temperature for the day was about 74 F.

Survey date: 7 May 1993 (Unit two only)

Cloud cover: 100 % Wind: 0 Temperature: 68 F

Visibility, general observation and listening conditions:

Excellent conditions throughout the day. Skies clearing at 0930, temperature rising to 80 F. Wind increased to 6 Kts NW at mid day.

APPENDIX B

Birds Recorded During Point Loma California Gnatcatcher Surveys on Point Loma

NOTE: The following lists present the species and number of individuals observed during each survey and within each survey unit. Each list includes all the species, with common and scientific names, recorded throughout the entire series of surveys. Thus, if no numbers of individuals follow the name, the species was not recorded during that particular survey.

Appendix B - Birds observed during Survey # 1: 25 February 1993.

Common Name	Scientific Name	Unit #		
		1	2	3
Brown Pelican	<i>Pelecanus occidentalis</i>	6		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			
Great Blue Heron	<i>Ardea herodias</i>			
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			
Mallard	<i>Anas platyrhynchos</i>			
Surf Scoter	<i>Melanitta perspicillata</i>			
Turkey Vulture	<i>Cathartes aura</i>		2	
Osprey	<i>Pandion haliaetus</i>			
Northern Harrier	<i>Circus cyaneus</i>		1	
Sharp-shinned Hawk	<i>Accipiter striatus</i>			
Cooper's Hawk	<i>Accipiter cooperii</i>	1		
Red-shouldered Hawk	<i>Buteo lineatus</i>			
Red-tailed Hawk	<i>Buteo jamaicensis</i>	4	3	1
American Kestrel	<i>Falco sparverius</i>	3	3	
Peregrine Falcon	<i>Falco peregrinus</i>			
California Quail	<i>Callipepla californica</i>	40		
Western Gull	<i>Larus occidentalis</i>	10		
Rock Dove	<i>Columba livia</i>			
Mourning Dove	<i>Zenaida macroura</i>	6		
Great Horned Owl	<i>Bubo virginianus</i>			
Common Poorwill	<i>Phalaenoptilus nuttallii</i>		1	
White-throated Swift	<i>Aeronautes saxatalis</i>			
Anna's Hummingbird	<i>Calypte anna</i>	8	6	18
Costa' Hummingbird	<i>Calypte costae</i>			
Calliope Hummingbird	<i>Stellula calliope</i>			
Rufous Hummingbird	<i>Selasphorus rufus</i>			
Common Flicker	<i>Colaptes auratus</i>			1
Olive-sided Flycatcher	<i>Contopus borealis</i>			
Western Wood-Pewee	<i>Contopus sordidulus</i>			
Hammond's Flycatcher	<i>Empidonax hammondii</i>			
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>			
Black Phoebe	<i>Sayornis nigricans</i>	2		
Say's Phoebe	<i>Sayornis saya</i>	3		
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>			
Cassin's Kingbird	<i>Tyrannus vociferans</i>			

Birds observed during Survey # 1, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Western Kingbird	<i>Tyrannus verticalis</i>			
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>			
Barn Swallow	<i>Hirundo rustica</i>			
Scrub Jay	<i>Apelocoma coerulescens</i>	4		
American Crow	<i>Corvus brachyrhynchos</i>			
Common Raven	<i>Corvus corax</i>	7	4	2
Bushtit	<i>Psaltriparus minimus</i>	30	20	19
Bewick's Wren	<i>Thyromanes bewickii</i>		4	8
California Gnatcatcher	<i>Polioptila californica</i>		1	
Swainson's Thrush	<i>Catharus ustulatus</i>			
Hermit Thrush	<i>Catharus guttatus</i>	3		8
American Robin	<i>Turdus migratorius</i>			
Wrentit	<i>Chamaea fasciata</i>	35	3	16
Northern Mockingbird	<i>Mimus polyglottos</i>	5		2
California Thrasher	<i>Toxostoma redivivum</i>	7		5
Cedar Waxwing	<i>Bombycilla cedrorum</i>			12
European Starling	<i>Sturnus vulgaris</i>	25		
Warbling Vireo	<i>Vireo gilvus</i>			
Orange-crowned Warbler	<i>Vermivora celata</i>	2	1	7
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Yellow-rumped Warbler	<i>Dendroica coronata</i>			1
Black-throated Gr. Warbler	<i>Dendroica nigrescens</i>			
Townsend's Warbler	<i>Dendroica townsendi</i>			
Hermit Warbler	<i>Dendroica occidentalis</i>			
MacGillivray's Warbler	<i>Oporornis tolmiei</i>			
Wilson's Warbler	<i>Wilsonia pusilla</i>			
Western Tanager	<i>Piranga ludoviciana</i>			
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>			
Lazuli Bunting	<i>Passerina amoena</i>			
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	40	33	4
California Towhee	<i>Pipilo crissalis</i>	35	25	18
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Savannah Sparrow	<i>Passerculus sandwichensis</i>		27	
Fox Sparrow	<i>Passerella iliaca</i>			

Birds observed during Survey # 1, Continued

<u>Common Name</u>	<u>Scientific Name</u>	<u>Unit #</u>		
		<u>1</u>	<u>2</u>	<u>3</u>
Song Sparrow	<i>Melospiza melodia</i>	28		7
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	2	6	6
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	15	9	
Dark-eyed Junco	<i>Junco hyemalis</i>			
Western Meadowlark	<i>Sturnella neglecta</i>		4	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			
Hooded Oriole	<i>Icterus cucullatus</i>			
Northern Oriole	<i>Icterus galbula</i>			
House Finch	<i>Carpodacus mexicanus</i>	9	5	
Pine Siskin	<i>Carduelis pinus</i>			1
Lesser Goldfinch	<i>Carduelis psaltria</i>		1	

Appendix B - Birds observed during Survey # 2: 5 March 1993.

Common Name	Scientific Name	Unit #		
		1	2	3
Brown Pelican	<i>Pelecanus occidentalis</i>			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			
Great Blue Heron	<i>Ardea herodias</i>		1	2
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			
Mallard	<i>Anas platyrhynchos</i>			
Surf Scoter	<i>Melanitta perspicillata</i>			
Turkey Vulture	<i>Cathartes aura</i>			
Osprey	<i>Pandion haliaetus</i>			
Northern Harrier	<i>Circus cyaneus</i>			
Sharp-shinned Hawk	<i>Accipiter striatus</i>			
Cooper's Hawk	<i>Accipiter cooperii</i>	1	1	
Red-shouldered Hawk	<i>Buteo lineatus</i>			
Red-tailed Hawk	<i>Buteo jamaicensis</i>			1
American Kestrel	<i>Falco sparverius</i>		1	2
Peregrine Falcon	<i>Falco peregrinus</i>			
California Quail	<i>Callipepla californica</i>	8		
Western Gull	<i>Larus occidentalis</i>	5		
Rock Dove	<i>Columba livia</i>	10		
Mourning Dove	<i>Zenaida macroura</i>	12		8
Great Horned Owl	<i>Bubo virginianus</i>			
Common Poorwill	<i>Phalaenoptilus nuttallii</i>			
White-throated Swift	<i>Aeronautes saxatalis</i>	4	12	
Anna's Hummingbird	<i>Calypte anna</i>	18		14
Costa' Hummingbird	<i>Calypte costae</i>			
Calliope Hummingbird	<i>Stellula calliope</i>			
Rufous Hummingbird	<i>Selasphorus rufus</i>	3		
Common Flicker	<i>Colaptes auratus</i>		1	
Olive-sided Flycatcher	<i>Contopus borealis</i>			
Western Wood-Pewee	<i>Contopus sordidulus</i>			
Hammond's Flycatcher	<i>Empidonax hammondii</i>			
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>			
Black Phoebe	<i>Sayornis nigricans</i>	1	1	1
Say's Phoebe	<i>Sayornis saya</i>	1	1	2
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>			
Cassin's Kingbird	<i>Tyrannus vociferans</i>			

Birds observed during Survey # 2, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Western Kingbird	<i>Tyrannus verticalis</i>			
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>			
Barn Swallow	<i>Hirundo rustica</i>	3		
Scrub Jay	<i>Aphelocoma coerulescens</i>	2		4
American Crow	<i>Corvus brachyrhynchos</i>			
Common Raven	<i>Corvus corax</i>	12	2	3
Bushtit	<i>Psaltriparus minimus</i>	40	20	14
Bewick's Wren	<i>Thyromanes bewickii</i>	5		5
California Gnatcatcher	<i>Polioptila californica</i>			
Swainson's Thrush	<i>Catharus ustulatus</i>			
Hermit Thrush	<i>Catharus guttatus</i>	1		4
American Robin	<i>Turdus migratorius</i>			
Wrentit	<i>Chamaea fasciata</i>	20		19
Northern Mockingbird	<i>Mimus polyglottos</i>	25	2	3
California Thrasher	<i>Toxostoma redivivum</i>	5		2
Cedar Waxwing	<i>Bombycilla cedrorum</i>			10
European Starling	<i>Sturnus vulgaris</i>	60	7	3
Warbling Vireo	<i>Vireo gilvus</i>			
Orange-crowned Warbler	<i>Vermivora celata</i>	3	1	2
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Yellow-rumped Warbler	<i>Dendroica coronata</i>			
Black-throated Gr. Warbler	<i>Dendroica nigrescens</i>			
Townsend's Warbler	<i>Dendroica townsendi</i>			
Hermit Warbler	<i>Dendroica occidentalis</i>			
MacGillivray's Warbler	<i>Oporornis tolmiei</i>			
Wilson's Warbler	<i>Wilsonia pusilla</i>			
Western Tanager	<i>Piranga ludoviciana</i>			
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>			
Lazuli Bunting	<i>Passerina amoena</i>			
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	50	4	5
California Towhee	<i>Pipilo crissalis</i>	50	9	11
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>			
Chipping Sparrow	<i>Spizella passerina</i>			
Savannah Sparrow	<i>Passerculus sandwichensis</i>			
Fox Sparrow	<i>Passerella iliaca</i>			

Birds observed during Survey # 2, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Song Sparrow	<i>Melospiza melodia</i>	40	3	9
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	7		11
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	34		15
Dark-eyed Junco	<i>Junco hyemalis</i>			
Western Meadowlark	<i>Sturnella neglecta</i>		19	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			
Hooded Oriole	<i>Icterus cucullatus</i>			
Northern Oriole	<i>Icterus galbula</i>			
House Finch	<i>Carpodacus mexicanus</i>	30		23
Pine Siskin	<i>Carduelis pinus</i>			
Lesser Goldfinch	<i>Carduelis psaltria</i>			

Appendix B - Birds observed during Survey # 3: 11 March 1993.

Common Name	Scientific Name	Unit #		
		1	2	3
Brown Pelican	<i>Pelecanus occidentalis</i>	5		
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			
Great Blue Heron	<i>Ardea herodias</i>		1	5
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			
Mallard	<i>Anas platyrhynchos</i>			
Surf Scoter	<i>Melanitta perspicillata</i>			
Turkey Vulture	<i>Cathartes aura</i>			
Osprey	<i>Pandion haliaetus</i>		2	
Northern Harrier	<i>Circus cyaneus</i>			
Sharp-shinned Hawk	<i>Accipiter striatus</i>			
Cooper's Hawk	<i>Accipiter cooperii</i>		1	
Red-shouldered Hawk	<i>Buteo lineatus</i>			2
Red-tailed Hawk	<i>Buteo jamaicensis</i>	6		2
American Kestrel	<i>Falco sparverius</i>	5	2	
Peregrine Falcon	<i>Falco peregrinus</i>		1	
California Quail	<i>Callipepla californica</i>	10	12	15
Western Gull	<i>Larus occidentalis</i>	4		
Rock Dove	<i>Columba livia</i>			
Mourning Dove	<i>Zenaida macroura</i>	25	1	14
Great Horned Owl	<i>Bubo virginianus</i>			
Common Poorwill	<i>Phalaenoptilus nuttallii</i>			
White-throated Swift	<i>Aeronautes saxatalis</i>	5	5	
Anna's Hummingbird	<i>Calypte anna</i>	8	1	31
Costa's Hummingbird	<i>Calypte costae</i>			
Calliope Hummingbird	<i>Stellula calliope</i>			
Rufous Hummingbird	<i>Selasphorus rufus</i>			4
Common Flicker	<i>Colaptes auratus</i>			3
Olive-sided Flycatcher	<i>Contopus borealis</i>			
Western Wood-Pewee	<i>Contopus sordidulus</i>			
Hammond's Flycatcher	<i>Empidonax hammondii</i>			
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>			
Black Phoebe	<i>Sayornis nigricans</i>			2
Say's Phoebe	<i>Sayornis saya</i>		1	
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>			
Cassin's Kingbird	<i>Tyrannus vociferans</i>			2

Birds observed during Survey # 3, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Western Kingbird	<i>Tyrannus verticalis</i>			
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>			
Barn Swallow	<i>Hirundo rustica</i>	8	3	1
Scrub Jay	<i>Aphelocoma coerulescens</i>	2		11
American Crow	<i>Corvus brachyrhynchos</i>		1	4
Common Raven	<i>Corvus corax</i>	18	9	6
Bushtit	<i>Psaltriparus minimus</i>	60	5	24
Bewick's Wren	<i>Thyromanes bewickii</i>	2	13	12
California Gnatcatcher	<i>Polioptila californica</i>			
Swainson's Thrush	<i>Catharus ustulatus</i>			
Hermit Thrush	<i>Catharus guttatus</i>	3		10
American Robin	<i>Turdus migratorius</i>			
Wrentit	<i>Chamaea fasciata</i>	28	16	28
Northern Mockingbird	<i>Mimus polyglottos</i>	20	5	15
California Thrasher	<i>Toxostoma redivivum</i>	3		5
Cedar Waxwing	<i>Bombycilla cedrorum</i>			12
European Starling	<i>Sturnus vulgaris</i>	24		
Warbling Vireo	<i>Vireo gilvus</i>			
Orange-crowned Warbler	<i>Vermivora celata</i>	3	3	20
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Yellow-rumped Warbler	<i>Dendroica coronata</i>			8
Black-throated Gr. Warbler	<i>Dendroica nigrescens</i>			
Townsend's Warbler	<i>Dendroica townsendi</i>			
Hermit Warbler	<i>Dendroica occidentalis</i>			
MacGillivray's Warbler	<i>Oporornis tolmiei</i>			
Wilson's Warbler	<i>Wilsonia pusilla</i>			
Western Tanager	<i>Piranga ludoviciana</i>			
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>			
Lazuli Bunting	<i>Passerina amoena</i>			
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	35	4	16
California Towhee	<i>Pipilo crissalis</i>	36	6	41
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>		10	
Chipping Sparrow	<i>Spizella passerina</i>			
Savannah Sparrow	<i>Passerculus sandwichensis</i>			
Fox Sparrow	<i>Passerella iliaca</i>			1

Birds observed during Survey # 3, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Song Sparrow	<i>Melospiza melodia</i>	42	3	9
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	9		10
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	12	5	5
Dark-eyed Junco	<i>Junco hyemalis</i>			
Western Meadowlark	<i>Sturnella neglecta</i>		16	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			
Hooded Oriole	<i>Icterus cucullatus</i>			
Northern Oriole	<i>Icterus galbula</i>			
House Finch	<i>Carpodacus mexicanus</i>	30	3	22
Pine Siskin	<i>Carduelis pinus</i>			
Lesser Goldfinch	<i>Carduelis psaltria</i>			4

Appendix B - Birds observed during Survey # 4: 12 April 1993.

Common Name	Scientific Name	Unit #		
		1	2	3
Brown Pelican	<i>Pelecanus occidentalis</i>			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			
Great Blue Heron	<i>Ardea herodias</i>			5
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			2
Mallard	<i>Anas platyrhynchos</i>			
Surf Scoter	<i>Melanitta perspicillata</i>			
Turkey Vulture	<i>Cathartes aura</i>			
Osprey	<i>Pandion haliaetus</i>			
Northern Harrier	<i>Circus cyaneus</i>			
Sharp-shinned Hawk	<i>Accipiter striatus</i>			2
Cooper's Hawk	<i>Accipiter cooperii</i>			
Red-shouldered Hawk	<i>Buteo lineatus</i>			
Red-tailed Hawk	<i>Buteo jamaicensis</i>			
American Kestrel	<i>Falco sparverius</i>	2	2	1
Peregrine Falcon	<i>Falco peregrinus</i>			
California Quail	<i>Callipepla californica</i>	11	8	13
Western Gull	<i>Larus occidentalis</i>	9		
Rock Dove	<i>Columba livia</i>	2		
Mourning Dove	<i>Zenaida macroura</i>	17		12
Great Horned Owl	<i>Bubo virginianus</i>	6		
Common Poorwill	<i>Phalaenoptilus nuttallii</i>			
White-throated Swift	<i>Aeronautes saxatalis</i>	1		1
Anna's Hummingbird	<i>Calypte anna</i>	20	1	19
Costa' Hummingbird	<i>Calypte costae</i>		1	
Calliope Hummingbird	<i>Stellula calliope</i>			4
Rufous Hummingbird	<i>Selasphorus rufus</i>			1
Common Flicker	<i>Colaptes auratus</i>		2	
Olive-sided Flycatcher	<i>Contopus borealis</i>			
Western Wood-Pewee	<i>Contopus sordidulus</i>			
Hammond's Flycatcher	<i>Empidonax hammondii</i>			
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>			1
Black Phoebe	<i>Sayornis nigricans</i>			2
Say's Phoebe	<i>Sayornis saya</i>			
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	1		4
Cassin's Kingbird	<i>Tyrannus vociferans</i>	2		

Birds observed during Survey # 4, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Western Kingbird	<i>Tyrannus verticalis</i>			
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>			
Barn Swallow	<i>Hirundo rustica</i>	14	8	8
Scrub Jay	<i>Apelocoma coerulescens</i>	7		14
American Crow	<i>Corvus brachyrhynchos</i>			
Common Raven	<i>Corvus corax</i>	12	22	8
Bushtit	<i>Psaltriparus minimus</i>	35	4	36
Bewick's Wren	<i>Thyromanes bewickii</i>	2	5	14
California Gnatcatcher	<i>Polioptila californica</i>			
Swainson's Thrush	<i>Catharus ustulatus</i>			
Hermit Thrush	<i>Catharus guttatus</i>			2
American Robin	<i>Turdus migratorius</i>			
Wrentit	<i>Chamaea fasciata</i>	10	2	36
Northern Mockingbird	<i>Mimus polyglottos</i>	32	11	14
California Thrasher	<i>Toxostoma redivivum</i>	2	2	6
Cedar Waxwing	<i>Bombycilla cedrorum</i>			12
European Starling	<i>Sturnus vulgaris</i>	18	3	15
Warbling Vireo	<i>Vireo gilvus</i>			1
Orange-crowned Warbler	<i>Vermivora celata</i>	4	5	17
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Yellow-rumped Warbler	<i>Dendroica coronata</i>			3
Black-throated Gr. Warbler	<i>Dendroica nigrescens</i>			
Townsend's Warbler	<i>Dendroica townsendi</i>			
Hermit Warbler	<i>Dendroica occidentalis</i>			
MacGillivray's Warbler	<i>Oporornis tolmiei</i>			
Wilson's Warbler	<i>Wilsonia pusilla</i>			1
Western Tanager	<i>Piranga ludoviciana</i>			
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>		1	
Lazuli Bunting	<i>Passerina amoena</i>			
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	28	6	22
California Towhee	<i>Pipilo crissalis</i>	23	12	48
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>		6	
Chipping Sparrow	<i>Spizella passerina</i>		3	6
Savannah Sparrow	<i>Passerculus sandwichensis</i>			
Fox Sparrow	<i>Passerella iliaca</i>			

Birds observed during Survey # 4, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Song Sparrow	<i>Melospiza melodia</i>	42	2	6
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>			9
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	15	2	1
Dark-eyed Junco	<i>Junco hyemalis</i>			6
Western Meadowlark	<i>Sturnella neglecta</i>		5	
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			1
Hooded Oriole	<i>Icterus cucullatus</i>			
Northern Oriole	<i>Icterus galbula</i>			
House Finch	<i>Carpodacus mexicanus</i>	27		32
Pine Siskin	<i>Carduelis pinus</i>			
Lesser Goldfinch	<i>Carduelis psaltria</i>			2

Appendix B - Birds observed during Survey # 5: 29 April 1993.

Common Name	Scientific Name	Unit #		
		1	2	3
Brown Pelican	<i>Pelecanus occidentalis</i>			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			
Great Blue Heron	<i>Ardea herodias</i>			5
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			
Mallard	<i>Anas platyrhynchos</i>			
Surf Scoter	<i>Melanitta perspicillata</i>			25
Turkey Vulture	<i>Cathartes aura</i>			
Osprey	<i>Pandion haliaetus</i>			
Northern Harrier	<i>Circus cyaneus</i>			
Sharp-shinned Hawk	<i>Accipiter striatus</i>			
Cooper's Hawk	<i>Accipiter cooperii</i>			
Red-shouldered Hawk	<i>Buteo lineatus</i>			
Red-tailed Hawk	<i>Buteo jamaicensis</i>			1
American Kestrel	<i>Falco sparverius</i>	1		
Peregrine Falcon	<i>Falco peregrinus</i>		1	
California Quail	<i>Callipepla californica</i>	24	4	24
Western Gull	<i>Larus occidentalis</i>	12		10
Rock Dove	<i>Columba livia</i>	7		6
Mourning Dove	<i>Zenaida macroura</i>	27	3	25
Great Horned Owl	<i>Bubo virginianus</i>			1
Common Poorwill	<i>Phalaenoptilus nuttallii</i>			
White-throated Swift	<i>Aeronautes saxatalis</i>		2	1
Anna's Hummingbird	<i>Calypte anna</i>	9		20
Costa' Hummingbird	<i>Calypte costae</i>			1
Calliope Hummingbird	<i>Stellula calliope</i>			
Rufous Hummingbird	<i>Selasphorus rufus</i>			1
Common Flicker	<i>Colaptes auratus</i>			
Olive-sided Flycatcher	<i>Contopus borealis</i>			2
Western Wood-Pewee	<i>Contopus sordidulus</i>			
Hammond's Flycatcher	<i>Empidonax hammondii</i>			2
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>			4
Black Phoebe	<i>Sayornis nigricans</i>	2	2	3
Say's Phoebe	<i>Sayornis saya</i>			
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	2		4
Cassin's Kingbird	<i>Tyrannus vociferans</i>			

Birds observed during Survey # 5, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Western Kingbird	<i>Tyrannus verticalis</i>	17	5	20
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	1		
Barn Swallow	<i>Hirundo rustica</i>	12	8	6
Scrub Jay	<i>Apelocoma coerulescens</i>	7	1	9
American Crow	<i>Corvus brachyrhynchos</i>			
Common Raven	<i>Corvus corax</i>	3		2
Bushtit	<i>Psaltriparus minimus</i>	33	2	44
Bewick's Wren	<i>Thyromanes bewickii</i>	1	1	19
California Gnatcatcher	<i>Polioptila californica</i>			
Swainson's Thrush	<i>Catharus ustulatus</i>			
Hermit Thrush	<i>Catharus guttatus</i>			
American Robin	<i>Turdus migratorius</i>			1
Wrentit	<i>Chamaea fasciata</i>	10	4	24
Northern Mockingbird	<i>Mimus polyglottos</i>	26	4	27
California Thrasher	<i>Toxostoma redivivum</i>	3		6
Cedar Waxwing	<i>Bombycilla cedrorum</i>	9		12
European Starling	<i>Sturnus vulgaris</i>	30	1	40
Warbling Vireo	<i>Vireo gilvus</i>			6
Orange-crowned Warbler	<i>Vermivora celata</i>	3	2	31
Nashville Warbler	<i>Vermivora ruficapilla</i>			1
Yellow Warbler	<i>Dendroica petechia</i>		1	1
Yellow-rumped Warbler	<i>Dendroica coronata</i>			1
Black-throated Gr. Warbler	<i>Dendroica nigrescens</i>			4
Townsend's Warbler	<i>Dendroica townsendi</i>			8
Hermit Warbler	<i>Dendroica occidentalis</i>			4
MacGillivray's Warbler	<i>Oporornis tolmiei</i>			1
Wilson's Warbler	<i>Wilsonia pusilla</i>	22		32
Western Tanager	<i>Piranga ludoviciana</i>			4
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>			2
Lazuli Bunting	<i>Passerina amoena</i>			6
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	19	9	24
California Towhee	<i>Pipilo crissalis</i>	45	6	49
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>			
Chipping Sparrow	<i>Spizella passerina</i>			14
Savannah Sparrow	<i>Passerculus sandwichensis</i>			
Fox Sparrow	<i>Passerella iliaca</i>			

Birds observed during Survey # 5, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Song Sparrow	<i>Melospiza melodia</i>	53	1	11
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>	6		2
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>			1
Dark-eyed Junco	<i>Junco hyemalis</i>			
Western Meadowlark	<i>Sturnella neglecta</i>			
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>			
Brown-headed Cowbird	<i>Molothrus ater</i>			1
Hooded Oriole	<i>Icterus cucullatus</i>	3		6
Northern Oriole	<i>Icterus galbula</i>		2	
House Finch	<i>Carpodacus mexicanus</i>	35	2	67
Pine Siskin	<i>Carduelis pinus</i>			1
Lesser Goldfinch	<i>Carduelis psaltria</i>			5

Appendix B - Birds observed during Survey # 6: 6 May 1993.

Common Name	Scientific Name	Unit #		
		1	2	3
Brown Pelican	<i>Pelecanus occidentalis</i>			
Double-crested Cormorant	<i>Phalacrocorax auritus</i>			5
Great Blue Heron	<i>Ardea herodias</i>	1		3
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>			
Mallard	<i>Anas platyrhynchos</i>		2	
Surf Scoter	<i>Melanitta perspicillata</i>			
Turkey Vulture	<i>Cathartes aura</i>			
Osprey	<i>Pandion haliaetus</i>			
Northern Harrier	<i>Circus cyaneus</i>			
Sharp-shinned Hawk	<i>Accipiter striatus</i>			
Cooper's Hawk	<i>Accipiter cooperii</i>			
Red-shouldered Hawk	<i>Buteo lineatus</i>			1
Red-tailed Hawk	<i>Buteo jamaicensis</i>		1	1
American Kestrel	<i>Falco sparverius</i>	1	2	
Peregrine Falcon	<i>Falco peregrinus</i>			
California Quail	<i>Callipepla californica</i>	38	21	22
Western Gull	<i>Larus occidentalis</i>	3	12	40
Rock Dove	<i>Columba livia</i>	2	7	
Mourning Dove	<i>Zenaida macroura</i>	23	11	21
Great Horned Owl	<i>Bubo virginianus</i>			1
Common Poorwill	<i>Phalaenoptilus nuttallii</i>			
White-throated Swift	<i>Aeronautes saxatalis</i>	6	9	
Anna's Hummingbird	<i>Calypte anna</i>	9		16
Costa' Hummingbird	<i>Calypte costae</i>			
Calliope Hummingbird	<i>Stellula calliope</i>			
Rufous Hummingbird	<i>Selasphorus rufus</i>			
Common Flicker	<i>Colaptes auratus</i>			
Olive-sided Flycatcher	<i>Contopus borealis</i>			
Western Wood-Pewee	<i>Contopus sordidulus</i>		1	1
Hammond's Flycatcher	<i>Empidonax hammondii</i>			
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>			1
Black Phoebe	<i>Sayornis nigricans</i>		2	2
Say's Phoebe	<i>Sayornis saya</i>			
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>			3
Cassin's Kingbird	<i>Tyrannus vociferans</i>			

Birds observed during Survey # 6, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Western Kingbird	<i>Tyrannus verticalis</i>		1	8
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	3		
Barn Swallow	<i>Hirundo rustica</i>	6	16	6
Scrub Jay	<i>Aphelocoma coerulescens</i>	2	5	14
American Crow	<i>Corvus brachyrhynchos</i>			
Common Raven	<i>Corvus corax</i>	5	7	3
Bushtit	<i>Psaltriparus minimus</i>	25	30	40
Bewick's Wren	<i>Thyromanes bewickii</i>	5	12	18
California Gnatcatcher	<i>Polioptila californica</i>			
Swainson's Thrush	<i>Catharus ustulatus</i>			1
Hermit Thrush	<i>Catharus guttatus</i>			
American Robin	<i>Turdus migratorius</i>			1
Wrentit	<i>Chamaea fasciata</i>	7	8	33
Northern Mockingbird	<i>Mimus polyglottos</i>	24		27
California Thrasher	<i>Toxostoma redivivum</i>	5		7
Cedar Waxwing	<i>Bombycilla cedrorum</i>			
European Starling	<i>Sturnus vulgaris</i>	19	22	39
Warbling Vireo	<i>Vireo gilvus</i>	2		4
Orange-crowned Warbler	<i>Vermivora celata</i>	12	12	19
Nashville Warbler	<i>Vermivora ruficapilla</i>			
Yellow Warbler	<i>Dendroica petechia</i>			
Yellow-rumped Warbler	<i>Dendroica coronata</i>			
Black-throated Gr. Warbler	<i>Dendroica nigrescens</i>			
Townsend's Warbler	<i>Dendroica townsendi</i>			1
Hermit Warbler	<i>Dendroica occidentalis</i>			
MacGillivray's Warbler	<i>Oporornis tolmiei</i>			
Wilson's Warbler	<i>Wilsonia pusilla</i>			14
Western Tanager	<i>Piranga ludoviciana</i>			2
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>			3
Lazuli Bunting	<i>Passerina amoena</i>			
Rufous-sided Towhee	<i>Pipilo erythrophthalmus</i>	30	21	18
California Towhee	<i>Pipilo crissalis</i>	33	37	47
Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>		14	
Chipping Sparrow	<i>Spizella passerina</i>			14
Savannah Sparrow	<i>Passerculus sandwichensis</i>			
Fox Sparrow	<i>Passerella iliaca</i>			

Birds observed during Survey # 6, Continued

Common Name	Scientific Name	Unit #		
		1	2	3
Song Sparrow	<i>Melospiza melodia</i>	40	20	10
Golden-crowned Sparrow	<i>Zonotrichia atricapilla</i>			
White-crowned Sparrow	<i>Zonotrichia leucophrys</i>			
Dark-eyed Junco	<i>Junco hyemalis</i>			
Western Meadowlark	<i>Sturnella neglecta</i>			
Brewer's Blackbird	<i>Euphagus cyanocephalus</i>			2
Brown-headed Cowbird	<i>Molothrus ater</i>			
Hooded Oriole	<i>Icterus cucullatus</i>		2	
Northern Oriole	<i>Icterus galbula</i>		1	
House Finch	<i>Carpodacus mexicanus</i>	27	18	94
Pine Siskin	<i>Carduelis pinus</i>			
Lesser Goldfinch	<i>Carduelis psaltria</i>		1	5

APPENDIX C

Photocopy of Memorandum by Rod Dossey
regarding his report of Gnatcatcher sightings
on Point Loma

Ser 522/23-91
14 AUG 92

MEMORANDUM

From: Rod Dossey, Mary Platter-Rieger's student, Code 522
To: LCDR Smith, Environmental Office Subase, San
Diego

Subj: GNATCATCHER SIGHTING

1. Due to the rain yesterday, I went to Subase to collect the lizard traps. Three of the traps were set out behind weapons area on Subase. In order to easily reach them I had to hike along the dirt road next to Ashburn road. As I walked away from the car, I heard the mewing sound of a Gnatcatcher. At first I decided it was probably a mocking bird, but I went back to the car to get my binoculars anyway. When I returned, the sound had stopped; so, I proceeded to collect the traps. On my way back as I stood near the eucalyptus trees, I again heard the mewing in the canyon. I proceeded back along the road to where I heard the mewing and stopped to listen. After a few moments, I heard it again below me on the slope. I proceeded down the slope. About 20 yards off the road I heard the mewing near-by. Stopping to look for the bird, I began making calls that I knew attracted Gnatcatchers into the open. Finally, I saw the bird, but couldn't get a positive identification due to the obstruction of branches. The bird then flew over the road. After pursuing the bird across the road, I was able to get a clear view of the bird and positively identified it as a Gnatcatcher, I then tried to determine which species of gnatcatcher it was by seeing the underside of the tail where the field markings for species identification occur. After pursuing the Gnatcatcher all the way to the stand of acacia's at the end of the road, I could not get a look at the underside of its tail. I then lost sight of it. There were two unusual things about this sighting. The first is that gnatcatchers normally occur in pairs, but I only saw one bird. The second is that the amount of area covered by the bird was much larger than I have ever seen covered by a Gnatcatcher. This could be because it was by itself and not on a shared territory with a mate.

2. The time when I saw the bird was about 15:45. I returned later with LT ED CARLSON in an attempt to obtain a photograph. After two hours of surveying we could not find the bird.

3. There are two species it could possibly be, the Blue-Grey Gnatcatcher or the California Gnatcatcher. Of the two species, the California Gnatcatcher is the more probable based on the habitat and location. It is also the species that is currently being proposed for federal listing as endangered.

4. In speaking to Phil Unit, the Curator of Ornithology at the San Diego Museum of Natural History, he said that it was really too early in the season to see the migratory Blue-Grey Gnatcatchers. In addition he said that it was the right time of year to see dispersing California Gnatcatchers exhibiting the type of behavior I witnessed. He told me that there is a "chance" it could be an early migratory Blue-Grey Gnatcatcher, but felt it was most likely the California Gnatcatcher.

MR. ROD DOSSEY

16 Sept 93

While I was out mapping sensitive plant species I saw a California Gnatcatcher. I was standing behind the Graveyard right at the fence line with Subase. I was about 50 yards south of the pipeline that runs up the hill, along Steamplant Road. The area was about two canyons north of where I had my previous sighting. The Gnatcatcher, along with a mockingbird, and a black phoebe were catching insects as they blew off the top of the slope. It was perched on several dead tree branches that had probably been tossed over the fence by the Graveyard maintenance staff. I was able to sit down and clearly observe the bird for at least fifteen minutes as it hunted. I could not tell if there was a pair or not, but I never saw more than one bird at a time. Using the bird book I had with me I decided the bird was most probably a female, based on the color of its plumage. There were also two scrub jays in the area. After watching the bird I went down the hill and returned a few hours later with Mary Platter-Rieger. We were unable to relocate the bird.

**Appendix M-Terrestrial Biological Survey and
Inventory of Navy Property on Point
Loma, San Diego, California, 1993**

**TERRESTRIAL BIOLOGICAL SURVEY
AND INVENTORY OF NAVY PROPERTY
ON POINT LOMA, SAN DIEGO, CALIFORNIA**

May 1993

prepared for:

Officer in Charge of Construction
Naval Command, Control and Ocean Surveillance Center
Research, Development, Test, and Evaluation Division
San Diego, California 92152-5000

prepared by:

Advanced Sciences, Inc.
4909 Murphy Canyon Road
Suite 500
San Diego, California 92123

SUMMARY

This report was prepared at the request of the Naval Command, Control and Ocean Surveillance Center (NCCOSC) Research, Development, Test, and Evaluation (RDT&E) Division for the purpose of updating the 1981 Terrestrial Biological Survey and Inventory of Navy Property on Point Loma (Woodward-Clyde Consultants 1981).

Preparation of the updated report included reviewing relevant, available published and unpublished literature on the flora and fauna of southern California and adjacent Baja California. Contacts were made with the U.S. Fish and Wildlife Service, National Park Service, California Department of Fish and Game, California Native Plant Society, private and University biologists, and local ecology-oriented organizations. Extensive use was made of the California Natural Diversity Data Base for information on known sensitive plant and animal occurrences on Point Loma.

Updated lists of plant and animal species observed or detected and sensitive species presently, historically, or potentially occurring on Point Loma were compiled from field surveys in combination with the above sources. The most current available nomenclature, legal status, regional distribution, and natural history of these sensitive species have been presented in this report.

A total of 1,250 acres were reviewed during the summer and fall of 1992. Properties surveyed included the Naval Command, Control and Ocean Surveillance Center Research, Development, Test, and Evaluation Division; Submarine Support Facility; Naval Supply Center - Point Loma Annex; Fleet Combat Training Center; Naval Degaussing Station; and the U.S. Coast Guard Area - Point Loma Annex. Approximately 51 percent (633 acres) of the reviewed land area was relatively undisturbed native wildland. The combination of topography, soils, and vegetation on the Point Loma Navy lands provides habitat for a diverse assemblage of plant and animal species. Six natural habitat types were delineated including southern maritime chaparral, maritime sage scrub, southern coastal bluff scrub, California grassland, southern foredune vegetation, and intertidal habitat. Nearshore areas on the bayside include eelgrass habitat. Human-generated habitat included urban, cultivated/landscaped, and disturbed areas.

The 1981 mapping of habitat types (Woodward-Clyde Consultants) was field checked and maps reflecting their 1992 distribution were produced. Sensitive plant populations mapped in 1981 were revisited to confirm their continued existence. Wildlife surveys consisted of walking transects through areas of natural habitat on Point Loma Navy lands. During field surveys particular emphasis was placed on the presence and distribution of sensitive species and their habitats. Locations of sensitive plant and animal species observed in the survey areas were mapped.

The term sensitive species denotes those plant or animal species that are currently listed or under consideration for listing by various federal, state, and local agencies and institutions as rare, threatened or endangered. The Endangered Species Act, as amended defines an

endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range other than species of the class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man." A threatened species is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." An explanation of each federal category, from Endangered to Category 3, and of state and California Native Plant Society designations is presented in Table 3-3.

Sixteen plant and 18 resident animal species considered sensitive by federal, state, or local agencies occur or have been known to occur on Point Loma (Table 3-3, 3-6). Six of these are listed or proposed to be listed as threatened or endangered by the U.S. Fish and Wildlife Service. No plant species observed on Point Loma Navy lands are currently listed as threatened or endangered by the U.S. Fish and Wildlife Service or the California Department of Fish and Game. Orcutt's spineflower (*Chorizanthe orcuttiana*), a Category 1 candidate plant species, was recently included in a listing package and may be proposed for listing in the near future. The California brown pelican (*Pelicanus occidentalis californicus*), California least tern (*Sterna antillarum browni*), and American peregrine falcon (*Falco peregrinus anatum*) are listed as endangered by the U.S. Fish and Wildlife Service. The western snowy plover (*Charadrius alexandrinus nivosus*) and the California gnatcatcher (*Poliophtila californica*) are listed as threatened by the U.S. Fish and Wildlife Service.

Five plant and eight resident animal species, considered Category 2 candidates for listing as threatened or endangered by the U.S. Fish and Wildlife Service, occur or have been known to occur on Point Loma (Table 3-3, 3-6). Six resident animal species are considered sensitive by the California Department of Fish and Game. Forty-one bird species considered sensitive by federal, state, or local agencies have been known to occur on Point Loma as migrants or vagrants. An additional 10 plant and 10 animal species considered sensitive were identified as potentially occurring on Point Loma Navy lands (Table 3-4, 3-7).

The goals and survey methods of the 1992 effort were designed to provide information on the biological resources present on the Point Loma Navy lands for facilities planning purposes. Species listed as threatened or endangered and candidate species for listing by the U.S. Fish and Wildlife Service are of primary importance in facilities planning on federal lands. Although not required by law to do so, the U.S. Navy may consider the effect of its projects on plant and animal species of concern to state and local agencies. An important component of planning for sensitive species management goals is provision of sufficient high quality habitat for the species of concern. Consideration of the vegetation and wildlife present on the Point Loma Navy lands, early in facilities planning efforts, can be expected to reduce public and agency opposition to new construction or modification of existing facilities required to meet mission goals.

As development has proceeded in the San Diego region, substantial losses of sensitive species and native habitat have occurred. Much of the remaining habitat in the coastal area has been fragmented, or broken into small, often isolated units. Conservation biologists and resource agencies are increasingly concerned about the detrimental effects of fragmentation on habitats and the plants and animals that use them. Wide stretches of urbanized lands between formerly connected habitat units act as a barrier, reducing or preventing movement of plants and animals between units. Studies have shown that isolated habitat units experience a loss of biodiversity over time. Point Loma is a moderately sized, relatively isolated, habitat unit with a large

number and complex mosaic of habitats. Consideration of the effects of fragmentation on the biological resources of Point Loma will contribute to the Navy's efforts to manage their wildland resources.

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LIST OF ACRONYMS

CDFG	California Department of Fish And Game
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CFGC	California Fish and Game Commission
CNPS	California Native Plant Society
GIS	Geographic Information System
MLLW	Mean Lower Low Water
NCCOSC	Naval Command, Control and Ocean Surveillance Center.
NDDDB	California Natural Diversity Database
NEPA	National Environmental Policy Act
NRaD	Research, Development, Test and Evaluation Division
NW	Northwest
PSBS	Pacific Southwest Biological Services
R-E-D	Rarity, Endangerment and Distribution Code of the California Native Plant Society
USFWS	United States Fish and Wildlife Service.
WCC	Woodward-Clyde Consultants

CHAPTER ONE

INTRODUCTION

1. INTRODUCTION

The Navy lands on the Point Loma peninsula, situated at the western edge of San Diego Bay (Figure 1-1) contain approximately 633 acres of wildlands. The undeveloped naval property and adjacent undeveloped federal lands include a small, but important portion of the remaining, relatively protected, native coastal vegetation and wildlife habitat in southern California (Zemba 1992).

The peninsula ranges in elevation from sea level to 428 feet. It is surrounded by the waters of the Pacific Ocean to the west and south, the San Diego Bay to the east, and by private residential developments to the north. Point Loma wildlands are relatively isolated from the native inland biota. The area functions much like an island in a maritime climate with steep ocean cliff escarpments of up to 200 feet. To some native plant species, reptiles, amphibians, small and large mammals, and land bird species, Point Loma is an island with limited contact and dispersal to other similar areas (see Section 4).

The purpose of this biological inventory is to update the Woodward-Clyde Consultants (WCC) 1981 inventory of the wildlands of Point Loma and report on the terrestrial vegetation and wildlife contained within the designated federal property boundaries. The biological inventory consists of two phases: 1) the review of previous studies conducted on Point Loma, and 2) further field studies updating the 1981 Inventory of the native vegetation and terrestrial vertebrate wildlife species present.

Sensitive vegetation types, wildlife habitats, and the presence of threatened, endangered, rare, or otherwise unique plant and animal species were of particular concern. Specific field studies included the revision of the 1981 mapping of the natural vegetation and rare plant populations, bird inventories, and general wildlife observations.

1.1 GEOLOGY AND SOILS

Since changes in geology and soils normally occur at a slow pace, the information reported by WCC (1981) remains pertinent. It is reproduced below for the convenience of the reader.

Soils, local microclimate, and historic factors have combined to produce a diverse environmental setting for vegetation and wildlife. Soils are an important factor in the distribution and composition of the present vegetation and, in particular, the distribution of sensitive plant species. The diverse sedimentary geology and respective soils contribute to the varied vegetative composition of the peninsula.

In contrast with the relatively unbroken topography of the San Diego embayment and coastal mesa systems, the Point Loma peninsula is the result of uplifting associated with the Point Loma fault and several adjacent minor shear zones

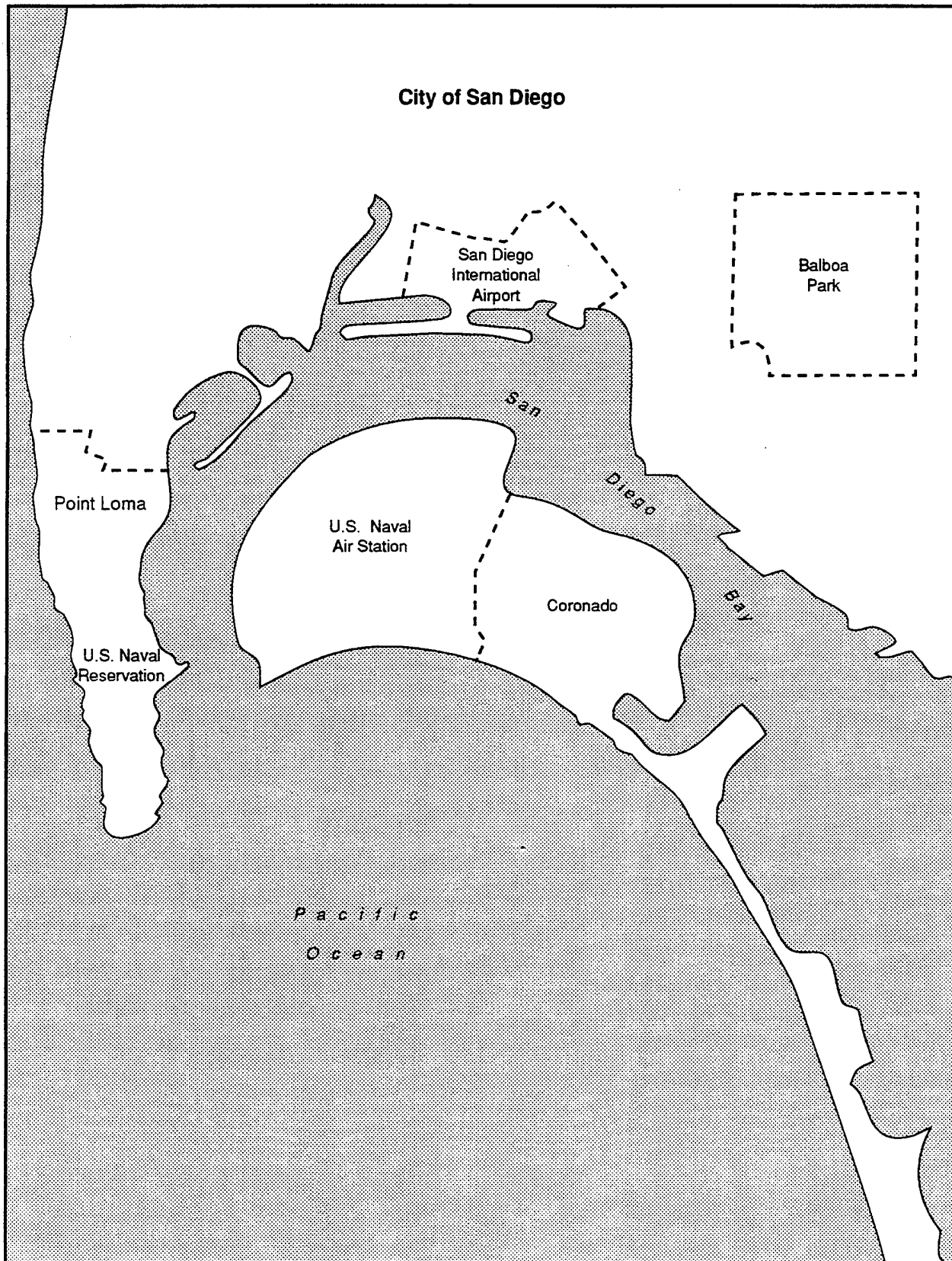


Figure 1-1. Location of the Point Loma peninsula and study area

(Kennedy 1975). The steep topographic relief of the peninsula and its inherent geologic diversity provide a diverse environment for vegetation and wildlife.

The geological stratigraphy of Point Loma consists primarily of uplifted marine sedimentary strata of upper cretaceous age (approximately 100,000,000 years ago). These strata, as influenced by climate and history, provide the basic parent material for the development of Point Loma soils. Soils derived from these strata often reflect the physical and chemical makeup of the respective sediments.

The Point Loma Geologic Formation, underlying the entire peninsula, consists of marine mudstone, siltstone, and fine sandstone deposits. Soils derived from these sediments are clay loams of the Hambright series (Bowman 1973). This is the typical bluish clay soil of the lower northwest slopes (Figure 1-2).

The Cabrillo Formation, also of upper cretaceous age, overlies the Point Loma Formation. Gaviota sandy loams, composed primarily of sandstone and sandstone conglomerate sediments derived from the Cabrillo Formation are typical of the soils on eastern and upper western slopes of Point Loma (Bowman 1973).

The Pleistocene Age Linda Vista Formation caps most of the peninsula at an elevation above 300 feet. This formation was deposited at sea level as beach dunes approximately 100,000 years ago, and these old beach ridges are now represented by highly weathered sandstones. Soils derived from this formation are classified as coarse loamy sandstones of the Marina and Carlsbad soil series (Bowman 1973). These sandstone soils support many of the most rare plant species.

The alluvial plain of the Bay Point Formation rings the Point Loma peninsula at an elevation of 80 to 100 feet. This terrace, best represented at the base of the west slope, was at sea level approximately 30,000 years ago. Soils formed in alluvium and slope wash from adjacent hillsides are known as the Reift series, a fine sand loam (Bowman 1973).

1.2 VEGETATION AND WILDLIFE

Point Loma has a Mediterranean climate with cool wet winters and dry warm summers. It receives a total annual average rainfall of 9.5 inches (National Oceanic and Atmospheric Administration, Lindberg Field). Vegetation in the study area consists predominantly of drought-tolerant brushland types, which are well adapted to the semiarid maritime climate that is typical of coastal southern California.

The natural vegetation of Point Loma constitutes a diverse assemblage of over 117 native and 53 introduced plant species. Five basic natural plant communities, totaling approximately 600 acres, have been identified and mapped on federal property, including:

- southern maritime chaparral,
- maritime sage scrub,

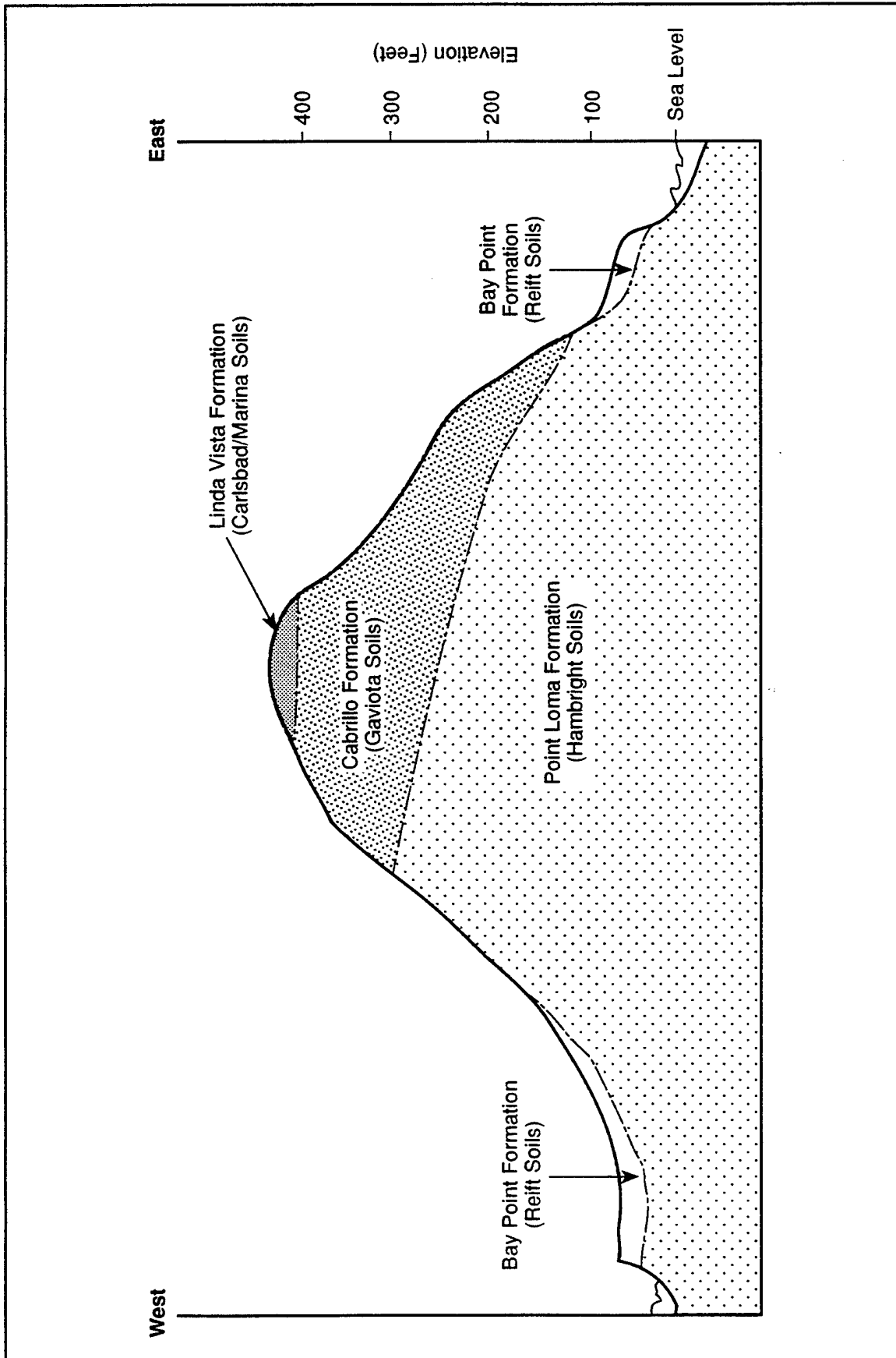


Figure 1-2. Generalized cross section of Point Loma illustrating geologic strata and soils

- southern coastal bluff scrub,
- California grassland, and
- southern foredune vegetation.

In addition to the terrestrial communities, eelgrass beds are present in the nearshore environment along the edge of San Diego Bay. The diverse vegetation, topography, soils, and the maritime location provide habitat for several terrestrial and sea-related vertebrate wildlife species. Eight species of reptiles and amphibians, 15 species of small and large mammals, and over 300 species of birds are known to inhabit Point Loma or use portions of the peninsula seasonally.

Sensitive plant and animal species are a primary concern in the biological inventory. Sixteen plant, 2 reptile, 14 resident bird, and 2 small mammal species inhabiting Navy property are considered rare, threatened, or endangered by the criteria of various federal, state, or local agencies and institutions. Additional sensitive wildlife species, including 6 reptiles, 1 bird, and 3 mammals, were identified as possibly present on Point Loma. Ten additional potentially sensitive plant species were identified that are present or expected to occur on Point Loma. These additional species are of interest to resource managers due to increased concern expressed by agencies and institutions about these species' rarity. Sensitive plant populations and sensitive wildlife habitat have been the focus of much of the research and mapping effort during this study.

CHAPTER TWO

METHODS

2. METHODS

This chapter describes the methods used in conducting literature and agency reviews, surveys, and mapping, and in the determination of the edge area ratios for the 1992 terrestrial survey and inventory of the Point Loma Navy lands. While methods used during the Woodward-Clyde Consultants (WCC) 1981 survey and inventory were adhered to where possible for consistency, changes in technology that have occurred in the interim period were incorporated to enhance the accuracy and usefulness of the data.

2.1 LITERATURE REVIEW AND AGENCY CONTACTS

Available published and unpublished literature on the flora and fauna of southern California and adjacent Baja California was reviewed. Inquiries were made with resource management agencies, including the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). Private and university biologists, local ecology-oriented organizations, and staff at Cabrillo National Monument were contacted for information relevant to Point Loma Navy lands. Natural resource specialists at Naval Command, Control and Ocean Surveillance Center Research, Development, Test, and Evaluation Division (NRaD) and Southwest Division were contacted. Information from their files, including documents prepared under the National Environmental Policy Act (NEPA), were reviewed. Extensive use was made of the California Natural Diversity Data Base (NDDDB) for information on known occurrences of sensitive plants and animals on Point Loma (NDDDB 1992). The NDDDB provided information on the known distribution, state, and global endangerment rankings as well as other indicators of sensitivity for Point Loma species.

Updated lists of all plant and animal species observed or detected and all sensitive species presently, historically, or potentially occurring on Point Loma were compiled from field surveys in combination with the above sources. The most current available nomenclature, legal status, regional distribution, and natural history of these sensitive species have been presented in this report.

The botanical nomenclature used in this report was based on Beauchamp's *Flora of San Diego County, California* (1986). Common names for nonsensitive plant species are from Beauchamp (1986) except where no common name is given. In such cases, the common name listed in the 1981 survey is retained. Common names for sensitive species follow the California NDDDB (1992). Nomenclature for sensitive wildlife species in this report was based on the Code of Federal Regulations, Title 50, Part 17 (1991), and the Bureau of National Affairs, Title 50, Part 17 (1992).

2.2 VEGETATION

Surveys for sensitive plant species were conducted on June 5, 23, 24, 26, 30; July 2 and 22; and September 22, 1992. The June and July survey team consisted of two botanists familiar with the

sensitive plant species of southern California. The September 22 survey included both Advanced Sciences, Inc., and NRaD biologists. Locations where groups of sensitive plants were mapped during the 1981 survey were relocated and checked for the continued existence of these plants, and to determine if all species of concern in 1992 had been recorded. Any differences were noted on field maps. No special effort was made to verify the mapping of species that were of concern in 1981 but that are no longer considered by the various resource agencies to be of concern in 1992. Plant observations (1992) were made during walks between sites mapped in 1981. In choosing routes between previously mapped locations those areas considered most likely to represent habitat for sensitive species were given the highest priority. The determination of likelihood of occurrence was based on an informal analysis of the relationship between previously mapped sensitive species locations and known environmental factors such as soil type, exposure, and slope. As a result of this analysis, special attention was given to areas of native vegetation with low shrub cover; on south-facing slopes; and where Gaviota, Marina, and Carlsbad soil types were present. Areas where sandy soils occur in openings in chaparral vegetation were also given higher priority. This maximized the probability of finding sensitive species populations known to occur on the study area. In addition, these areas are also most likely to provide habitat for Orcutt's spine-flower (*Chorizanthe orcuttiana*) and other species not currently known to occur on Point Loma but which occur in similar habitats in coastal Southern California and northwestern Baja California.

There is a potential that a previously undetected sensitive species may occur in habitats with characteristics different from those with which the expected sensitive species are associated. In addition, the adaptation of the known sensitive species may be sufficiently broad to allow them to grow in habitats that do not conform completely to the expectations generated in the analysis. To address such possibilities observational transects were walked in areas that did not exhibit the above mentioned cover, slope and soil characteristics.

Maps (WCC 1981) of the vegetation communities and sensitive plant species on Point Loma Navy lands were spot-checked in the field to determine if the map units were correctly identified. Special emphasis was placed on areas where development activity is high and areas where new development had taken place since 1981. Notes were made on the field maps if the vegetation found in 1992 was significantly different from that mapped in 1981. An aerial photograph of Point Loma was used to help identify new areas of development.

The data were transferred onto base maps produced by NRaD and printed on velum at a scale of 1 inch:100 feet. Areas noted to have changed in the period between 1981 and 1992 were remapped using the available aerial photography. The map data were digitized using a Summagraphics Microgrid 2 board and were stored as digital files in the ARC/INFO GIS file format.

The digitized data were then plotted at 1 inch:100 feet and checked against the velum drafts for accuracy. The maps were then field-checked to verify the data. Modifications determined to be appropriate during the field check were made to the digital files. The final mapping was reproduced as a set of 12 sheets on D-size (22- by 34-inch) paper. Reductions of the D-size maps (on 11- by 17-inch paper) are bound into this report as Appendix A.

The Patton Edge/Area index (Patton 1975) was used to provide a quantitative description of the relationship between the area of the study site and the amount of edge present. This is calculated using the formula:

$$DI = \frac{TP}{2\sqrt{A \cdot \pi}}$$

TP is the total perimeter plus all the linear edge within the study area. This formula relates the ratio of edge to area in the study area with the edge to area ratio for a circle of the same area. Patton's index is unitless and may be expressed as the percentage difference between a circle and the polygon being analyzed. The percentage is derived with the following formula:

$$\text{Percent} = (DI - 1) \cdot 100$$

2.3 WILDLIFE

Field surveys were conducted during June, July, August, and September of 1992. A total of 12 site visits were made. Surveys consisted of walking meandering transects through areas of natural habitat on Point Loma Navy lands. Surveys commenced in the early morning hours and continued throughout the afternoon. Some surveys continued until the onset of darkness. During each site visit, notes were taken on the wildlife species observed in the area surveyed. Species were identified during field surveys by data collected audibly and by direct observation or examination of tracks, scat, and other sign.

Field surveys on the southernmost portion of the Naval Submarine Base were limited due to access restrictions. One site visit to this area was made in September under the escort of NRD biologist Mary Platter-Rieger. The 1992 field survey was restricted to the summer months. Therefore, migratory bird usage on Point Loma Navy lands was determined through literature review and agency contacts.

Surveys for the California gnatcatcher (*Poliophtila californica*) and other sensitive wildlife species were conducted concurrently with the general wildlife surveys. Field efforts were concentrated in habitats where sensitive wildlife species were considered most likely to occur, such as maritime sage scrub. However, all areas of natural habitat on Point Loma Navy lands were surveyed. The survey techniques for the California gnatcatcher were consistent with protocol as presented at the Wildlife Society's California Gnatcatcher Workshop (September 1991) and as described by Mock et al. (1990). Areas of habitat potentially supporting California gnatcatchers were surveyed one time, instead of three. Due to the contract period, all wildlife field surveys were conducted during June, July, August, and September of 1992. Ideally, California gnatcatcher surveys should occur between January and March when breeding territories are being established, but before the onset of egg-laying and incubation.

Wildlife habitats present on Point Loma Navy lands were defined by data collected through literature review and field effort. Locations of sensitive species observed in the survey areas were mapped. Map data were digitized and stored in the ARC/INFO GIS file format as described in Section 2.2.

CHAPTER THREE
RESULTS AND DISCUSSION

3. RESULTS AND DISCUSSION

This chapter presents the results of the literature and agency review, surveys, and mapping effort for the 1992 terrestrial survey and inventory of the Point Loma Navy lands. These results are discussed in relationship to the environmental regulations that may apply to federal actions affecting natural resources on Point Loma. These data are intended to update the 1981 Woodward-Clyde Consultants (WCC) survey and inventory and do not attempt to provide a precise remapping of all the habitat present nor of all the locations of sensitive species. This update is meant for use as a guide in early stages of planning, and all data should be verified by detailed, site-specific surveys when information for formal environmental documents is required.

3.1 VEGETATION AND HABITAT TYPES

The native terrestrial vegetation of the southern California coastal region consists mainly of low, shrub-dominated vegetation with occasional tall shrubs and small trees in protected canyons. Exposed headlands are often sparsely vegetated with low-growing shrubs and both leaf and stem succulents. The boundaries between vegetation types may be sharply delineated or may be characterized by gradual transitions in species composition and growth characteristics.

Nine terrestrial or semiterrestrial habitat types and one marine habitat type have been identified as occurring on or adjacent to the Point Loma Navy lands (Appendix A). These include the naturally occurring southern maritime chaparral (170 acres), maritime sage scrub (390 acres), southern coastal bluff scrub (39 acres), grassland (1 acre), and southern foredune (2 acres) vegetation types (Table 3-1). In addition, areas of urban habitat (362 acres), landscape vegetation (166 acres), and disturbed areas (89 acres) are present (Table 3-1). An intertidal zone (31 acres), having characteristics of both terrestrial and marine aquatic systems, is present and represents a transition between these fundamentally different habitat types.

3.1.1 Southern Maritime Chaparral

Chaparral is the most extensive native vegetation type on southern California wildlands. It generally occurs on relatively mesic, well-drained soils. The dominant plant species are shrubs with hard or leathery, evergreen leaves. Chaparral is a fire-adapted plant community ranging in height from 3 to 6 feet and often forming dense, almost impenetrable thickets. Dominant species on Point Loma include chamise (*Adenostoma fasciculatum*), wart-stemmed ceanothus (*Ceanothus verrucosus*), mission manzanita (*Xylococcus bicolor*), laurel sumac (*Malosma laurina*), and toyon (*Heteromeles arbutifolia*). Other species also occur in southern maritime chaparral on Point Loma Navy lands (Table 3-2).

Several authors have described the chaparral plant associations of California at varying levels of detail (Hanes 1977; England 1988; Munz 1974; Beauchamp 1986). Holland (1986) has defined

Table 3-1
Areal extent of vegetation/habitat types present
on the Point Loma Navy lands

Habitat Type	Acres	Percent of Total
Southern Maritime Chaparral	170	13.6%
Maritime Sage Scrub	390	31.2%
Southern Coastal Bluff Scrub	39	3.1%
California Grassland	1	0.1%
Southern Foredune Vegetation	2	0.1%
Intertidal Habitat	<u>31</u>	<u>2.5%</u>
Total Wildland Habitat	633	50.6%
Urban	362	29.0%
Landscape	166	13.3%
Disturbed	<u>89</u>	<u>7.1%</u>
Total Nonwildland	617	49.4%
Total Acreage	1,250	100.0%

several subtypes of chaparral vegetation. On the Point Loma Navy lands, the species composition of the chaparral vegetation is similar to Holland's (1986) southern maritime chaparral but lacks one of Holland's indicator species for the type, the Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*). It does, however, fit his criteria for soil type, structure, and physiognomy. In addition, Holland's list of species associated with southern maritime chaparral is similar to those found on the Point Loma Navy lands. The U.S. Fish and Wildlife Service (USFWS) (Zemba 1992) has indicated that they also classify the chaparral present on Point Loma as southern maritime chaparral.

Zemba (1992) states that only 2,500 acres of southern maritime chaparral remain in southern California. The approximately 170 acres of this vegetation type on the Point Loma Navy lands represents about 6.8 percent of the remaining stock of this sensitive habitat type. The USFWS considers all southern maritime chaparral habitat on Point Loma to be sensitive, and any proposed actions that would affect this resource should be addressed in the National Environmental Policy Act (NEPA) process.

3.1.2 Maritime Sage Scrub

The dominant, nonchaparral, upland scrub vegetation of coastal southern California has been described by authors variously as coastal sage scrub and coastal sage succulent scrub (Moody 1977; de Becker 1988; Munz 1974), inland sage scrub and maritime succulent scrub

Table 3-2
Plant species occurring on the Point Loma Navy lands^a

Scientific Name	Common Name
Southern Maritime Chaparral	
<i>Adenostoma fasciculatum</i>	Chamise ^b
<i>Adiantum jordani</i>	California maidenhair fern
<i>Amsinkia intermedia</i>	Ranchers fiddleneck
<i>Antirrhinum nuttallianum</i>	Nuttall's snapdragon
<i>Baccharis pilularis</i> var. <i>consanguinea</i>	Coyote-brush
<i>Calandrinia ciliata</i> var. <i>menziesii</i>	Red maids ^b
<i>Calandrinia maritima</i>	Sea kisses
<i>Calystegia macrostegia</i>	Morning glory
<i>Cardamine californica</i>	Milk maids
<i>Ceanothus verrucosus</i>	Wart-stemmed ceanothus
<i>Centaureum venustum</i>	Canchalagua
<i>Cleome isomeris</i>	Bladderpod
<i>Cordylanthus filifolius</i>	Dark-tipped bird's beak
<i>Corethrogyne filaginifolia</i> var. <i>incana</i>	San Diego sand aster
<i>Corethrogyne filaginifolia</i> var. <i>virgata</i>	Virgate sand aster
<i>Crassula connata</i>	Pigmy stone crop
<i>Cryptantha</i> sp.	Cryptantha
<i>Cryptantha intermedia</i>	Nievitas
<i>Cuscuta californica</i>	Witch's hair
<i>Descurainia sophia</i>	Fine-leaf tansey-mustard
<i>Dichelostemma pulchella</i>	Wild hyacinth
<i>Diplacus puniceus</i>	Coast monkey flower
<i>Eremocarpus setigerus</i>	Doveweed
<i>Eriodictyon crassifolium</i>	Yerba santa
<i>Eriophyllum confertiflorum</i> var. <i>confertiflorum</i>	Long-stemmed golden yarrow
<i>Foeniculum vulgare</i>	Fennel
<i>Galium nuttallii</i> ssp. <i>nuttallii</i>	Nuttall's bedstraw
<i>Hazardia squarrosus</i> ssp. <i>grindelioides</i>	Saw toothed golden bush
<i>Helianthemum scoparium</i>	Rushrose
<i>Heteromeles arbutifolia</i>	Toyon
<i>Jepsonia parryi</i>	Coast jepsonia
<i>Lomatium lucidum</i>	Shiny lomatium
<i>Lotus scoparius</i> spp. <i>scoparius</i>	Coastal deer weed
<i>Malosma laurina</i>	Laurel sumac ^b
<i>Marah macrocarpus</i>	Cucamonga manroot
<i>Mirabilis californica</i> var. <i>californica</i>	Coastal wishbone

(table continues)

Table 3-2 (continued)

Scientific Name	Common Name
<i>Navarretia hamata</i>	Hooked navarretia
<i>Navarretia atractyoides</i>	Holly-leaf skunkweed ^b
<i>Opuntia littoralis</i> var. <i>littoralis</i>	Coastal prickly-pear cactus
<i>Opuntia parryi</i> var. <i>serpentina</i>	Snake cholla
<i>Opuntia prolifera</i>	Coastal cholla
<i>Orobanche parishii</i> spp. <i>brachyloba</i>	Beach broomrape
<i>Pellaea andromedaefolia</i>	Coffee fern
<i>Pellaea mucronata</i> var. <i>mucronata</i>	Bird's foot cliff-brake
<i>Pholisma arenarium</i>	Sand plant
<i>Pityrogramma triangularis</i> var. <i>triangularis</i>	California goldenback fern ^b
<i>Pterostegia drymarioides</i>	Granny's hairnet
<i>Quercus dumosa</i>	Coastal scrub oak ^b
<i>Rhamnus crocea</i>	Spiny redberry ^b
<i>Sanicula</i> sp.	Sanicle
<i>Selaginella cinerascens</i>	Mesa moss fern
<i>Senecio californicus</i>	California butterweed
<i>Silene laciniata</i> spp. <i>major</i>	Southern pink
<i>Sisyrinchium bellum</i>	California blue-eyed grass
<i>Solanum parishii</i>	Parish's nightshade
<i>Stephanomeria virgata</i> ssp. <i>virgata</i>	Virgate wreath-plant
<i>Vicia ludoviciana</i>	Deerpea vetch
<i>Viola pedunculata</i> ssp. <i>pendunculata</i>	Yellow johnny-jump-ups
<i>Xylococcus bicolor</i>	Mission manzanita ^b

Weeds and Exotic Plants

<i>Acacia baileyana</i>	Bailey's acacia
<i>Acacia longifolia</i>	Golden wattle ^b
<i>Acacia melanoxydon</i>	Balckwood acacia
<i>Acacia verticillata</i>	Acacia
<i>Anagallis arvensis</i> var. <i>arvensis</i>	Scarlet pimpernel
<i>Artemisia tridentata</i>	Great basin sagebrush
<i>Atriplex lentiformis</i>	Quail brush ^b
<i>Atriplex leucophylla</i>	Beach saltbush
<i>Atriplex semibaccata</i>	Australian saltbush
<i>Avena barbata</i>	Slender oat ^b
<i>Avena fatua</i>	Wildoat
<i>Bothriochloa barbinoides</i>	Plumed beardgrass

(table continues)

Table 3-2 (continued)

Scientific Name	Common Name
<i>Bromus diandrus</i>	Common rip-gut grass ^b
<i>Bromus mollis</i>	Soft chess ^b
<i>Bromus rubens</i>	Foxtail chess ^b
<i>Callistemon</i> sp.	Bottle brush
<i>Carpobrotus aequilaterus</i>	Sea-fig ^b
<i>Carpobrotus edulis</i>	Hottentot-fig
<i>Ceanothus tomentosus</i> ssp. <i>olivaceus</i>	Ramona lilac
<i>Centaurea melitensis</i>	Star thistle ^b
<i>Chenopodium album</i>	Lamb's quarters
<i>Chenopodium murale</i>	Goosefoot ^b
<i>Chrysanthemum coronarium</i>	Garland chrysanthemum ^b
<i>Cistus villosus</i>	Mediterranean rock rose
<i>Coryza canadensis</i>	Common horseweed
<i>Coryza coulteri</i>	No common name
<i>Cortaderia jubata</i>	Atacama pampus grass
<i>Cotula coronopifolia</i>	African brass buttons
<i>Cynodon dactylon</i>	Bermudagrass
<i>Dimorphotheca sinuata</i>	Cape-marigold
<i>Elaeagnus</i> sp.	Russian olive
<i>Encelia farinosa</i>	Desert encelia
<i>Erodium cicutarium</i>	Filaree
<i>Erodium moschatum</i>	Storksbill
<i>Eremocarpus setigerus</i>	Doveweed ^b
<i>Eriogonum giganteum</i> ssp. <i>giganteum</i>	St. Catherine's lace
<i>Eucalyptus camaldulensis</i>	Murray red gum
<i>Eucalyptus ficifolia</i>	Flaming eucalyptus
<i>Euphorbia peplus</i>	Petty spurge
<i>Foeniculum vulgare</i>	Fennel
<i>Gazania longiscapa</i>	Treasure flower
<i>Geranium</i> sp.	Cranesbill
<i>Hordeum munitum</i> ssp. <i>leporinum</i>	Hare barley ^b
<i>Hypericum canariense</i>	Canary Island hypericum
<i>Lamarckia aurea</i>	Golden top
<i>Limonium sinuatum</i>	Notchleaf marsh rosemary
<i>Lythrum hyssopifolia</i>	Grass poly ^b
<i>Malva parviflora</i>	Cheeseweed ^b
<i>Marrubium vulgare</i>	Horehound
<i>Medicago polymorpha</i>	Burr clover
<i>Melilotus albus</i>	White sweet clover

(table continues)

Table 3-2 (continued)

Scientific Name	Common Name
<i>Mesembryanthemum crystallinum</i>	Crystal ice-plant
<i>Mesembryanthemum nodiflorum</i>	Little ice-plant
<i>Myoporum laetum</i>	Myoporum
<i>Narcissus tazetta</i>	Paper-white
<i>Nicotiana glauca</i>	Tree tobacco
<i>Oxalis corniculata</i>	Yellow sorrel
<i>Poa annua</i>	Annual bluegrass
<i>Pennisetum clandestinum</i>	Kikuyu grass
<i>Phoenix canariensis</i>	Canary Island date palm
<i>Pinus torreyana</i>	Torrey pine
<i>Platanus racemosa</i>	California sycamore
<i>Polypogon monspeliensis</i>	Rabbit foot beardgrass
<i>Prunus lyonii</i>	Catalina Island cherry
<i>Raphanus sativus</i>	Wild radish
<i>Ricinus communis</i>	Castor bean
<i>Salsola australis</i>	Russian thistle
<i>Schinus icrebinthifolius</i>	Brazilian pepper tree
<i>Schinus molle</i>	Peruvian pepper tree
<i>Sonchus asper</i>	Sow-thistle
<i>Sonchus oleraceus</i>	Common sow thistle
<i>Stellaria</i> sp.	Chickweed
<i>Washingtonia robusta</i>	Red palm
<i>Xanthium spinosum</i>	Cocklebur
Maritime Sage Scrub	
<i>Allium haematochiton</i>	Red-skin wild onion
<i>Amblyopappus pusillus</i>	Pineapple weed ^b
<i>Apiastrum angustifolium</i>	Wild-celery
<i>Artemisia californica</i>	Coastal sagebrush ^b
<i>Astragalus trichopodus</i> ssp. <i>leucopsis</i>	Ocean locoweed
<i>Baccharis sarothroides</i>	Broom baccharis
<i>Bergerocactus emoryi</i>	Golden-spined cereus
<i>Calandrinia breweri</i>	Brewer's calandrinia
<i>Calandrinia maritima</i>	Sea kisses
<i>Calochortus weedii</i> var. <i>weedii</i>	Weed's mariposa lily
<i>Castilleja foliolosa</i>	Felt paint-brush
<i>Chamaesyce polycarpa</i>	Small-seed sandmat

(table continues)

Table 3-2 (continued)

Scientific Name	Common Name
<i>Chlorogalum pomeridianum</i>	Wavy-leaf soap-plant
<i>Chorizanthe californica</i>	California spine flower
<i>Chorizanthe fimbriata</i> var. <i>fimbriata</i>	Fringed spine flower
<i>Clematis pauciflora</i>	Small-leaf virgin's bower
<i>Cneoridium dumosum</i>	Spice bush ^b
<i>Croton californicus</i>	Croton
<i>Dichondra occidentalis</i>	Western ponyfoot
<i>Dudleya edulis</i>	Ladyfingers
<i>Dudleya lanceolata</i>	Coastal dudleya
<i>Dudleya pulverulenta</i>	Chalk lettuce
<i>Elymus condensatus</i>	Giant wildrye
<i>Encelia californica</i>	California encelia ^b
<i>Eriogonum fasciculatum</i> ssp. <i>fasciculatum</i>	Flat-topped buckwheat ^b
<i>Erysimum ammophilum</i>	Coast wall flower
<i>Euphorbia misera</i>	Cliff spurge
<i>Euphorbia</i> sp.	Spurge
<i>Ferocactus viridescens</i>	San Diego barrel cactus
<i>Filago californica</i>	California filago ^b
<i>Gnaphalium bicolor</i>	Cudweed
<i>Gnaphalium californicum</i>	California everlasting
<i>Gnaphalium microcephalum</i>	White everlasting
<i>Hypochoeris glabra</i>	Smooth cat's-ears
<i>Malacothamnus fasciculatus</i> var. <i>fasciculatus</i>	Mesa bushmallow
<i>Mammillaria dioica</i>	Fishhook cactus
<i>Muhlenbergia microsperma</i>	Littleseed muhly
<i>Nicotiana clelandii</i>	Cleveland's tobacco
<i>Oligomeris linifolia</i>	Narrow leaf oligomeris
<i>Opuntia paryi</i> var. <i>serpentina</i>	Snake cholla
<i>Opuntia prolifera</i>	Coastal cholla
<i>Orobanche parishii</i> ssp. <i>brachyloba</i>	Short-lobed broomrape
<i>Papaver californicum</i>	Fire poppy
<i>Parietaria hespera</i> var. <i>californica</i>	Western pellitory
<i>Piperia cooperii</i>	Rein orchid
<i>Pityrogramma triangularis</i> var. <i>viscosa</i>	Silverback fern
<i>Plantago erecta</i> ssp. <i>erecta</i>	Plantain
<i>Rhus integrifolia</i>	Lemonadeberry ^b
<i>Salvia columbariae</i> ssp. <i>columbariae</i>	Chia
<i>Salvia mellifera</i>	Black sage ^b
<i>Simmondsia chinensis</i>	Jojoba ^b

(table continues)

Table 3-2 (continued)

Scientific Name	Common Name
<i>Stipa coronata</i>	Giant stipa
<i>Stylocline gnaphalioides</i>	Everlasting nest-straw
<i>Viguiera laciniata</i>	San Diego sunflower
<i>Yucca schidigera</i>	Mohave yucca
<i>Zigadenus fremontii</i> var. <i>fremontii</i>	Fremont's camas
Southern Coastal Bluff Scrub	
<i>Agave shawii</i>	Shaw's agave
<i>Cakile edentula</i>	Sea rocket
<i>Cardionema ramosissimum</i>	Sand mat
<i>Cressa truxillensis</i>	Alkalai weed
<i>Distichilis spicata</i>	Coastal salt grass ^b
<i>Frankenia salina</i>	Alkali-heath
<i>Isocoma venetus</i> ssp. <i>furfuraceus</i>	Coastal isocoma
<i>Lycium californicum</i>	California desert-thorn ^b
<i>Perityle emoryi</i>	Emory rock-daisy
<i>Spergularia villosa</i>	Villous sand-spurry
<i>Suaeda californica</i> var. <i>pubescens</i>	Sea-blite ^b
Southern Foredune Vegetation	
<i>Abronia maritima</i>	Red sand verbena ^b
<i>Ambrosia bipinnatifida</i>	Beach burr weed ^b
<i>Camissonia bistorta</i>	Southern sun-cup
<i>Camissonia cheiranthifolia</i> ssp. <i>suffruticosa</i>	Beach evening primrose ^b
<i>Corethrogyne filaginifolia</i> var. <i>virgata</i>	Virgate sand-aster
California Grassland	
<i>Agrostis diegoensis</i>	Leafy bent ^b
<i>Coreopsis maritima</i>	San Diego sea dahlia
<i>Eschscholzia californica</i> var. <i>peninsularis</i>	Annual California poppy
<i>Fritillaria biflora</i>	Chocolate lily
<i>Lasthenia californica</i>	Common goldfields

(table continues)

Table 3-2 (continued)

Scientific Name	Common Name
<i>Linanthus dianthiflorus</i> ssp. <i>dianthiflorus</i>	Ground pink
<i>Lupinus</i> sp.	Lupine
<i>Polypodium californicum</i>	California polypody
<i>Stipa lepida</i>	Foothill stipa ^b

^a Includes confirmed sitings by PSBS (1988)
^b Indicator species for plant community types

(Beauchamp 1986), and as coastal sage scrub and coastal succulent scrub (Westman 1983). Westman's (1983) study further divided the coastal sage scrub into regional subtypes. The Westman (1983) subtype mapped as occurring on Point Loma is Diegan sage scrub and is characterized by California sagebrush (*Artemisia californica*), flat-top buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), and lemonadeberry (*Rhus integrifolia*).

Westman also described Martirian and Vizcainan subtypes occurring in Baja California. Important species occurring in these types include spice bush (*Cneoridium dumosum*), golden-spined cereus (*Bergerocactus emoryi*), California desert-thorn (*Lycium californicum*), and cliff spurge (*Euphorbia misera*).

Holland (1986) developed preliminary descriptions of the terrestrial natural communities of California. These have been adopted by the California Department of Fish and Game (CDFG) and are used in environmental reporting in San Diego County as well as other parts of California. These habitat classifications are also used in the California Natural Diversity Data Base (NDDB 1992). The Holland (1986) types present on Point Loma Navy lands include Diegan coastal sage scrub and maritime succulent scrub. For the purposes of this report, these subcategories will be included within the maritime sage scrub vegetation type.

Based on its widespread use in southern California and its similarity to Westman's work, Holland's (1986) nomenclature for the components of maritime sage scrub vegetation will be used in this report. The relatively high importance of species associated with coastal scrub communities in Baja California suggests that Diegan coastal sage scrub on Point Loma has strong affinities with Westman's Martirian and Vizcainan types.

The majority of the coastal scrub vegetation on Point Loma may be classified as the Diegan coastal sage scrub subtype. In addition, significant portions of the coastal scrub vegetation falls within Holland's (1986) maritime succulent scrub classification. On the Point Loma Navy lands, maritime sage scrub covers approximately 390 acres (31.2 percent) of the available area (Table 3-1). These two vegetation types share many species in common and are most easily

distinguished by the generally lower cover values and higher numbers of leaf and stem succulents present in maritime succulent scrub-dominated areas. Maritime succulent scrub vegetation is most commonly found where environmental factors lead to warmer and dryer conditions. These may include steeper slopes, slopes whose aspect includes a strong south-facing component, and areas with shallow, well-drained soils. In some areas, the borders between these two subtypes are clearly distinguishable, and in others areas a more gradual transition is present. Nonquantitative observations of the density of succulent species and cover values in the maritime sage scrub vegetation suggest that clear mappable delineation of these associations may require detailed quantitative studies. In order to avoid confusion, both Diegan coastal sage scrub and maritime succulent scrub have been treated as subassociations within the broader maritime sage scrub vegetation type.

3.1.2.1 Diegan Coastal Sage Scrub

The Diegan coastal sage scrub is characterized by an assemblage of soft-leafed, semideciduous, drought-tolerant shrubs. It tends to be low-growing, seldom exceeding 3 feet in height. The cover provided by sage scrub vegetation varies from 100 percent to less than 60 percent at different locations. Cover values are high on much of the western slope of Point Loma, resulting in a nearly closed canopy. Few openings between shrubs are present, and the cover and density of annual and perennial herbaceous species are relatively low.

The dominant shrub species in Diegan coastal sage scrub vegetation on Point Loma include California sage brush, flat-top buckwheat, California encelia (*Encelia californica*), spice bush, cliff spurge, lemonadeberry (*Rhus integrifolia*), and black sage (*Salvia mellifera*). Other species also occur in the Diegan coastal sage scrub component of maritime sage scrub on the Point Loma Navy lands (Table 3-2). The species composition of Diegan coastal sage scrub vegetation on Point Loma varies with slope, aspect, elevation, soils, and exposure to physical components of the environment such as wind. Although California sage brush usually dominates this vegetation type, local physical and historical conditions may lead to dominance by other species.

The California NDDDB (1992) gives the Diegan coastal sage scrub habitat type an endangered (G2) global ranking. Within the state of California, Diegan coastal sage scrub habitat is also considered endangered (S2.1) (NDDDB 1992). These indicators of endangerment are evidence that Diegan coastal sage scrub habitat is a unique and depleted resource. Losses of Diegan coastal sage scrub habitat should be avoided and may be considered a significant impact under NEPA as implemented by the Council on Environmental Quality (CEQ) guidelines. In addition, state and local agencies may consider losses of Diegan coastal sage scrub as significant impacts under the California Environmental Quality Act (CEQA) and local ordinances.

The USFWS indicates that over 70 percent of the Diegan coastal sage scrub habitat type in southern California has been eliminated (Zemba 1992). The presence of the extensive cliff spurge population on Point Loma in the Diegan coastal sage scrub in the study area is unusual and further emphasizes the sensitivity of this resource. The relatively large areal extent of this resource, the continuity of which is broken only by lightly used roads, also increases its value. The USFWS considers all Diegan coastal sage scrub habitat on Point Loma to be sensitive, and any proposed actions that would affect this resource should be addressed in the NEPA process.

3.1.2.2 Maritime Succulent Scrub

The maritime sage scrub type (Holland 1986) is characterized by low stature and low shrub-cover values; the presence of subligneous, soft-leaved shrubs; and a rich admixture of leaf and stem succulents. Holland listed several species whose primary distribution is in Baja California as important components of the maritime succulent scrub. On portions of the study area, this vegetation type is clearly delineated from the adjacent vegetation. In other areas, a distinct boundary is not present, and the characteristic succulent species extend into the adjoining chaparral and Diegan coastal sage scrub vegetation.

Maritime succulent scrub occurs on south-facing slopes or steep slopes of various aspects, and is the predominant vegetation type around the tip of the peninsula. The dominant shrub species are those found in Diegan coastal sage scrub. Both leaf and stem succulents such as coastal dudleya (*Dudleya lanceolata*), ladyfingers (*Dudleya edulis*), San Diego barrel cactus (*Ferocactus viridescens*), and snake cholla (*Opuntia parryi* var. *serpentina*) are often present. Other species also occur in the maritime succulent scrub component of the maritime sage scrub on the Point Loma Navy lands (Table 3-2).

The California NDDDB (1992) gives the maritime succulent scrub habitat type an extremely endangered (G1) global ranking. Within the state of California, Diegan coastal sage scrub habitat also is considered extremely endangered (S1.1) (NDDDB 1992). These indicators of extreme endangerment are evidence that maritime succulent scrub habitat is a unique and depleted resource. Losses of maritime succulent scrub habitat should be avoided and may be considered a significant impact under NEPA as implemented by CEQ guidelines. In addition, state and local agencies may consider losses of maritime succulent scrub as significant impacts under CEQA and local ordinances.

The USFWS indicates that only 1,000 acres of maritime succulent scrub remain in the southern California region (Zemba 1992). Although it is isolated from other stands of maritime succulent scrub in the region by urbanization, the resource on Point Loma is contiguous with other native vegetation/habitat within the study area. The degree of fragmentation resulting from human activity is also relatively low. The USFWS considers all maritime succulent sage scrub habitat on Point Loma to be sensitive, and any proposed actions that would affect this resource should be addressed in the NEPA process.

3.1.3 Southern Coastal Bluff Scrub

Southern coastal bluff scrub occurs at localized sites along the southern California coast and on the offshore islands (Holland 1986). It is characterized by low, often prostrate scrub species that are generally less than 2 feet in height. Some species may reach 6 feet in height over small areas. Dwarf shrubs, herbaceous perennials, annuals, and succulents may be present.

On the Point Loma Navy lands, California desert-thorn (*Lycium californicum*), Sea-blight (*Sueda californica*), and coastal salt grass (*Distichlis spicata*) are the most common species. In addition, cliff spurge, coastal isocoma (*Isocoma venetus* ssp. *furfuraceus*), sand mat (*Cardionema ramosissimum*), and sea rocket (*Cakile edentula*) are frequently observed native species. Leaf and stem succulents may also be present and include dudleyas (*Dudleya* spp.), San Diego barrel cactus (*Ferocactus viridescens*), Shaw's agave (*Agave shawii*), and golden-spined cereus

(*Bergerocactus emoryi*). Some portions of the area mapped as southern coastal bluff scrub have been invaded by aggressive exotics such as hottentot fig (*Carpobrotus edulis*) and Australian saltbush (*Atriplex semibaccata*). A variety of other species also occur in the southern coastal bluff scrub on the Point Loma Navy lands (Table 3-2).

The California NDDDB (1992) gives the southern coastal bluff scrub habitat type an extremely endangered (G1) global ranking. Within the state of California, southern coastal bluff scrub habitat also is considered extremely endangered (S1.1) (NDDDB 1992). These indicators of extreme endangerment are evidence that southern coastal bluff scrub habitat is a unique and depleted resource. State and local agencies may consider losses of southern coastal bluff scrub as significant impacts under CEQA and local ordinances.

The USFWS indicates that less than 1,500 acres of southern coastal bluff scrub habitat remain in southern California (Zembal 1992). The approximately 39 acres present in the study area represent about 2.6 percent of this limited acreage. The close integration of this resource with other native habitat in the study area is an important contributor to its overall value. The USFWS considers all southern coastal bluff scrub habitat on Point Loma to be sensitive, and any proposed actions that would affect this resource should be addressed in the NEPA process. Losses of southern coastal bluff scrub habitat should be avoided and may be considered a significant impact under NEPA as implemented by CEQ guidelines.

3.1.4 Southern Foredune Vegetation

On beaches where sand accumulates, two types of habitat are present on Point Loma Navy lands. The open, sandy beach within the intertidal zone does not support terrestrial vegetation. The character of this area type is discussed in Section 3.1.9 (Intertidal Zone). Along the shoreline, west of the degaussing pier, on the portion of the beach above the normal range of the tides, southern foredune vegetation is present. Approximately 2 acres of southern foredune vegetation is present on the Point Loma Navy lands.

Southern foredune vegetation occurs on beaches where sand accumulates from Point Conception to the international boundary with Mexico (Holland 1986). Although most of this low-growing plant community is dominated by herbaceous broad-leafed perennials, some portions of it are dominated by salt grass. Coastal isocoma and chaparral broom form a scrub-dominated strip along the inland edge. The sands on which southern foredune vegetation grows are generally loose, poor in nutrients, and easily eroded (Holland 1986).

On the Point Loma Navy lands, the dominant native species include beach evening-primrose (*Camissonia cheiranthifolia* ssp. *suffruticosa*), beach burr-weed (*Ambrosia bipinnatifida*), and red sand verbenia (*Abronia maritima*). The exotic hottentot fig has become established in southern foredune vegetation near the degaussing pier, and it dominates some areas. A variety of other species occur in the southern foredune vegetation on the Point Loma Navy lands (Table 3-2).

The California NDDDB (1992) gives the southern foredune habitat type an endangered (G2) global ranking. Due to its low acreage in the state of California, southern foredune habitat is considered extremely endangered (S1.2) (NDDDB 1992). These indicators of endangerment are evidence that southern foredune habitat is a unique and depleted resource. Losses of southern foredune habitat should be avoided and may be a significant impact under NEPA as

implemented by CEQ guidelines. In addition, state and local agencies may consider losses of southern foredune as significant impacts under the CEQA and local ordinances. While not specifically mentioned in comments by the USFWS (Zemba 1992), southern foredune vegetation is a scarce resource in the region and should be given consideration in the NEPA process.

3.1.5 Grasslands

Native grasslands in southern California occur most frequently on soils with a high clay content in areas that are subject to extended periods of summer drought (Kie 1988). The soils of the Point Loma Navy lands are generally low in clays, and hence, conditions for the development of extensive native grasslands are not optimal.

Stands of native perennial grasslands are rare in southern California as a result of climatic conditions and a long history of grazing (WCC 1981). Small isolated stands of leafy bent-grass (*Agrostis diegoensis*) and foothill needlegrass (*Stipa lepida*) occur at scattered locations on the Point Loma Navy lands (Appendix A). These grass species also occur in the understory of the Diegan coastal sage scrub and southern maritime chaparral vegetation types. Perennial grasses, where they occur in significant stands, were mapped as perennial grasslands. Although they are not mapped, smaller stands of perennial grassland contribute to the habitat mosaic and overall habitat diversity in the study area. Approximately 1 acre of perennial grasslands were mapped on the Point Loma Navy lands.

3.1.6 Urban Habitat

Urban habitat (Bride and Reid 1988) is characterized by the presence of man-made structures such as buildings, industrial facilities, storage areas, parking lots, roads, antenna installations, and other objects. Small inclusions of landscape vegetation, disturbed habitat, and isolated patches of native habitat may be present but represent a small percentage of the area mapped as urban habitat.

In urban habitat areas, most of the surface of the native soils has been covered with impermeable surfacing materials. The impermeability of the surfaces also contributes to increased runoff. Vegetation and structures in urban habitat may provide hiding and nesting areas for wildlife species able to tolerate the presence of nearby human activities. Limited foraging for some species is available from the waste stream of food-handling operations and the edible portions of weeds and landscape plants that may be present. Approximately 362 acres of urban habitat are present on the Point Loma Navy lands.

3.1.7 Cultivated/Landscape Vegetation

Land areas that are dominated by horticultural trees, shrubs, lawns, and other cultivated vegetation have been categorized as landscape vegetation. Approximately 166 acres of land within the Navy properties are dominated by exotic species. Introduced eucalyptus, Torrey pine, Monterey cypress, and other species provide habitat for bird species. Extensive areas, particularly in the vicinity of the Fuel Supply Depot, are dominated by the golden wattle (*Acacia longifolia*). These acacias are becoming established in chaparral and maritime sage scrub

vegetation, particularly in drainages and where disturbance has occurred. The presence of golden wattle in these habitats may lead to the reduction of dominance by native species and, hence, may represent a potential reduction in habitat quality for wildlife species requiring native vegetation.

3.1.8 Disturbed Areas

Disturbed areas include those portions of the Point Loma Navy lands that have been modified by human activities but which have not been covered by materials that would preclude the eventual reestablishment of vegetated habitat. Many disturbed areas on Point Loma are being revegetated by both volunteer native and weedy introduced species. In most areas, weed species are dominant. The kind of vegetation that eventually becomes established on a disturbed area depends on the degree to which the soils are modified, the extent of disturbance, the frequency with which the disturbance reoccurs, and the composition of seed sources that are able to disperse onto the modified area. A total of 89 acres of disturbed lands are present in the study area.

Disturbed areas provide habitat for numerous weedy and exotic species on the Point Loma Navy lands. Some of these species are restricted to areas of disturbance; others are able to invade adjacent native habitat. Among the latter are hottentot fig, several acacia species, Atacama pampas grass (*Cortaderia jubata*), and Australian saltbush.

3.1.9 Intertidal Zone

The intertidal zone represents a transition from terrestrial to marine habitats. As a result of the availability of an improved base map, those habitat types not addressed in the 1981 inventory are defined in this document. While intertidal habitat does not support terrestrial vegetation, algae and vascular marine species may be present. Intertidal habitat totals approximately 31 acres on the Point Loma Navy lands.

Both sandy beach and rocky intertidal habitats are present in the study area. On sandy beaches in the intertidal zone, no permanent macroscopic vegetation is present due to the erodability and transportability of the substrate. Some marine invertebrates reside in the sand. Sandy beach is equivalent to the coastal strand habitat referred to by the USFWS in their comments on Point Loma resources (Zemba 1992). Only 500 acres of coastal strand habitat remain in the southern California area.

Rocky beaches provide substrates capable of supporting a macroscopic algal community. In addition, numerous invertebrate and vertebrate species of marine life inhabit these areas.

Both sandy beaches and rocky intertidal areas provide foraging habitat for terrestrial species of invertebrates, birds, and mammals. Several species of sea birds use these areas as foraging grounds. The USFWS considers all habitat on Point Loma to be sensitive, and any proposed actions that would affect this resource should be addressed in the NEPA process.

Eelgrass Beds

NCCOSC (1992) conducted studies for the relocation of its Marine Mammal Facility from Kaneohe to San Diego. The following excerpt from the Environmental Assessment for that project (1992) describes aspects of the biology of eelgrass beds in San Diego Bay. The information on eelgrass beds described in this report was derived from the NCCOSC (1992) report. No field surveys for eelgrass habitat were conducted as part of the 1992 Inventory.

Much of the shoreline of San Diego Bay is fringed with beds of eelgrass (*Zostera marina*) (SDUPD 1980). Eelgrass is an attached, marine flowering plant that grows on the unconsolidated bottom in clear, calm water at intertidal and shallow subtidal depths between the MLLW line and about an 18-foot (5.5-meter) depth (SDUPD 1980). Approximately 600 acres of eelgrass are in San Diego Bay (Hoffman 1991).

Eelgrass beds are recognized as a particularly valuable type of marine habitat (Zimmerman et al. 1988). They enhance the physical and biological environment where they occur by a number of means (Phillips 1988). Their dense rhizome and root structures help to stabilize the substrate, and their erect leafy shoots are sufficiently dense to produce an erect leaf mass that forms a leaf baffle that retards currents and traps particulate matter. Thus, the sediments in an eelgrass bed are nutrient rich. The eelgrass meadow forms a nursery and a refuge for a very high diversity of plants and animals. A variety of plants and animals live on the blades. The leaves form the basis for a grazing foodchain, while the detritus particles from the dead and decaying leaves form the basis of an extensive detritus foodchain. Eelgrass beds support a higher abundance and diversity of fishes than comparable nonvegetated soft-bottom areas and are important as a nursery habitat for some species (Hoffman 1986). Eelgrass areas in San Diego Bay appear to be particularly important habitat for shiner surfperch (*Cymatogaster aggregata*), spotted sandbass (*Paralabrax maculatofasciatus*), and barred sandbass (*Paralabrax nebulifer*). Eelgrass beds also appear to play a role in supporting extensive populations of forage species within the bay. These forage fish species, such as northern anchovy (*Engraulis mordax*) and topsmelt (*Atherinops affinis*), constitute an important food base for higher order carnivores such as California halibut, spotted sand bass, sand bass, terns, and brown pelicans. Eelgrass is also important to the rock crab and spiny lobster that, as juveniles, find shelter and food between the grass blades and roots (Needham 1983).

Eelgrass beds are present on the sandy bottom of San Diego Bay adjacent to the NCCOSC RDT&E Piers 159, 160, 169, 302 and the planned Marine Mammal Research Facility site (NCCOSC 1992) (Figure d.) In these areas eelgrass occurs at depths of 12 to 13 feet (3.7 to 4.0 meters) MLLW inshore to a depth of 1 to 4 feet (0.3 to 1.2 meters). The eelgrass beds form a continuous fringe along the shoreline in the vicinity of the planned Marine Mammal Research Facility. In the NCCOSC RDT&E Pier area the eelgrass beds occur as discontinuous patches. A total of approximately 2.13 acres of eelgrass beds were mapped by the NCCOSC (1992) as occurring in the study area. The density of eelgrass turions in the study area ranged from 68 to 241 per square meter (NCCOSC 1992). This is low

compared to other eelgrass beds in San Diego Bay (NCCOSC 1992). Fauna associated with these eelgrass beds include spiny lobsters (*Panulirus interruptus*) and black surf perch (*Embiotica jacksoni*) (NCCOSC 1992).

Due to the high habitat values associated with eelgrass beds the National Marine Fisheries Service (1991) considers them to represent a sensitive habitat. When ever possible, projects should be designed to avoid impacts to eelgrass beds. Replacement mitigation may be required for losses of eelgrass habitat (National Marine Fisheries Service 1991).

3.2 SENSITIVE PLANT SPECIES

The term "sensitive plant species" denotes those plants that are currently listed or under consideration for listing by various federal, state, and local agencies and institutions as rare, threatened, or endangered. While many of these species have no legal status under federal law, they may be protected by state or local ordinances, and they may represent unique resources. The California NDDDB (1992) is a computerized compilation of information on plants and wildlife species that are of concern to the CDFG. In order to help resource managers determine the most appropriate approach to sensitive species, the NDDDB has ranked many of the species included in its files by perceived degree of endangerment. The ranking system indicates the global status and statewide status of the species. The global ranking indicates the perceived level of endangerment worldwide. The state ranking refers to the perceived level of endangerment in California.

As part of the federal government, the U.S. Navy is not under the jurisdiction of state or local resource protection agencies and, absent a specific waiver of sovereign immunity by Congress, is not obligated to implement local and state resource protection laws and ordinances. However, in the area of resource management, the Navy's policy of "good stewardship" directs naval personnel to consider species and communities listed or considered sensitive by other than federal mandate when a Navy action may affect such a resource.

Sixteen sensitive plant species occur or have been known to occur on Point Loma (Appendix A). Most of the species listed are considered to be of concern in the state of California by the California Native Plant Society (CNPS) (Smith and Berg 1988). The CNPS Inventory includes lists of plant species organized by levels of sensitivity (Table 3-3).

The CDFG has listed Orcutt's spineflower as endangered. In addition, all plant species appearing on CNPS Lists 1B and 2 meet the definition of Sec. 1901, Chapter 10 (Native Plant Protection) of the Department of Fish and Game Code and are eligible for state listing. Lists 3 and 4 consist of plants on which insufficient data are currently available but which experts have suggested may be declining or which are sufficiently uncommon to require increased attention by resource managers.

In the treatment of individual species, it will be noted that the USFWS, CDFG, CNPS, and NDDDB do not always appear to rank the same species at a uniform level of endangerment. In considering these various rankings, the Navy's first priority is to comply with the federal Endangered Species Act of 1973 as amended; hence, the most important indication for compliance with protection requirements is the USFWS listings. Provisions of the Endangered

Table 3-3
Sensitive plant species known to occur or to have occurred recently on Point Loma Navy lands

Scientific Name	Common Name	Federal ^a Category	State ^b Category	NDDB ^c / CNPS ^d Categories
<i>Agave shawii</i>	Shaw's agave	N	N	G3, S1.2 2 / 3-3-1
<i>Berberocactus emoryi</i>	Golden-spined cereus	N	N	G3, S2.1 2 / 2-2-1
<i>Calandrinia maritima</i>	Sea kisses	N	N	4 / 1-2-1
<i>Ceanothus verrecosus</i>	Wart-stemmed ceanothus	C2	N	2 / 1-2-1
<i>Chorizanthe orcuttiana</i>	Orcutt's spineflower	C1	E	G1, S1.1 1A
<i>Corethrogyne filaginifolia</i> var. <i>incana</i> ^e	San Diego sand aster	N	N	4 / 1-2-2
<i>Coreopsis maritima</i>	Sea dahlia	N	N	2 / 2-2-1
<i>Dichondra occidentalis</i>	Western ponyfoot	N	N	4 / 1-2-1
<i>Erysimum amnophilum</i>	Coast wallflower	C3c	N	4 / 1-2-3
<i>Euphorbia misera</i>	Cliff spurge	N	N	2 / 2-2-1
<i>Ferocactus viridescens</i> ^f	San Diego barrel cactus	C2	N	G3, S3.2 2 / 1-3-1
<i>Fritillaria biflora</i>	Chocolate lily	N	N	P-4 / 1-2-3
<i>Opuntia parryi</i> var. <i>serpentina</i>	Snake cholla	C2	N	G3T2, S1.1 1B / 3-3-2
<i>Orobancha parishii</i> ssp. <i>brachyloba</i>	Short-lobed broomrape	C2	N	G47, S2.2 1B / 2-2-2
<i>Selaginella cinerascens</i>	Ashy spike-moss	N	N	4 / 1-2-1
<i>Viguiera lacinata</i>	San Diego sunflower	N	N	2 / 1-2-1

^a U.S. Fish and Wildlife Service categories of threat and endangerment:

- N – Not currently listed
- E – Endangered
- T – Threatened

C1 – Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as threatened or endangered.
 C2 – Category 2: Taxa for which existing information indicates it may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

C3(a) – Category 3: Taxa more common than previously thought, no longer being considered for a listing proposal at this time.

(table continues)

Table 3-3 (continued)

^b State Listed Plants:
N – Not currently listed
E – Endangered
T – Threatened
R – Rare

^c Natural Diversity Data Base Priority Ranks:
Global Ranks (worldwide status)
G1 – Extremely endangered
G2 – Endangered
G3 – Restricted range, rare
G4 – Apparently secure
G5 – Demonstrably secure

State Ranks (status within the state)
S1 – Extremely endangered
S2 – Endangered
S3 – Restricted range, rare
S4 – Apparently secure
S5 – Demonstrably secure

A more precise degree of threat is often expressed by a decimal point followed by a number from 1 to 3. The number 1 represents the highest level of threat, and the number 3 represents the lowest level of threat. A question mark indicates that insufficient information is available or that uncertainty exists over the level of threat.

^d The California Native Plant Society (CNPS) lists of sensitive plants:
List 1A – Plants presumed extinct in California
List 1B – Plants rare, threatened, or endangered in California and elsewhere
List 2 – Plants rare, threatened, or endangered in California but more common elsewhere
List 3 – Plants about which more information is needed - a review list
List 4 – Plants of limited distribution - a watch list

The California Native Plant Society R-E-D Code:
Rarity (R)
1 – Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
2 – Occurrence confined to several populations or to one extended population
3 – Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported

(table continues)

Table 3-3 (continued)

Endangerment (E)

- 1 – Not endangered
- 2 – Endangered in a portion of its range
- 3 – Endangered throughout its range

Distribution (D)

- 1 – More or less widespread outside California
- 2 – Rare outside California
- 3 – Endemic to California

* Will appear as *Lessingia filaginifolia* var. *filaginifolia* in the Jepson Manual. In this treatment, it will become part of a broader species concept that may affect its rarity status. CNPS will not recognize the change in its new CNPS Inventory of Rare and Endangered Vascular Plants (5th Edition). May be placed on List 1B in the new CNPS Inventory of Rare and Endangered Vascular Plants (5th Edition).

† May be placed on List 4 in the new CNPS Inventory of Rare and Endangered Vascular Plants (5th Edition).

Species Act as amended, provide a mechanism for the USFWS to take into account the interests of state and local resource management agencies. The California NDDB and CNPS status information will help Navy resource managers analyze the interests and concerns of regulators and scientists outside the federal system.

Seven species (Table 3-4) are currently under consideration by the CNPS for inclusion in the Fifth Edition of the CNPS Inventory. They are included in this report to help the Navy's resource managers identify plant species whose status may change during the years between this inventory and subsequent inventories. If development pressures increase in coastal southern California, new species may be added to these lists. Resource managers should maintain regular contact with federal, state, and local agencies to update their files on sensitive species.

3.2.1 Federal and State Listed Threatened and Endangered Plant Species

No plant species observed on the Point Loma Navy lands are currently listed as threatened or endangered by the USFWS or the CDFG. However, both the snake cholla and Orcutt's spineflower have been included in a listing package by the USFWS and could be listed at any time (Zemba 1992). Orcutt's spineflower, a species listed by California as endangered, has been collected on areas currently under the jurisdiction of the Navy on Point Loma.

***Chorizanthe orcuttiana* (Orcutt's Spineflower)**

Orcutt's spineflower historically occurred at scattered locations on mesas and coastal bluffs from Point Loma north to Encinitas. Its known distribution has been limited to sites within San Diego County. This species is known from sandy soils and bare gravelly places (NDDB 1992). Orcutt's spineflower blooms from March to April, and all surveys for it should be conducted in this time frame. WCC (1981) suggested that, on Point Loma, soils derived from the Cabrillo and Linda Vista geologic formations (Figure 1-2) would provide the sandy substrate on which Orcutt's spineflower could occur.

On Point Loma, the NDDB (1992) lists two occurrences of Orcutt's spineflower. One was documented in 1906. The location was given as the "Military reservation, Pt. Loma, where old road branches down canyon towards the new lighthouse." Another sighting was made in 1987 "at the cemetery boundary along Cabrillo Memorial drive. NW & across rd from Bennington Monument." Neither of these occurrences has been confirmed in recent years. When the current CNPS Inventory (1988) was published, no recent confirmed sightings were known. At that time, it was presumed to be extinct. In 1991, a group of 20 plants was found near Encinitas, California (NDDB 1992).

WCC (1981) conducted surveys for Orcutt's spineflower on Point Loma Navy lands without success. Surveys conducted during the current inventory were done too late in the year to be assured of detecting this diminutive, annual species. Since habitat suitable for Orcutt's spineflower exists on the Navy lands and it is known to have occurred on Point Loma, it is recommended that it be presumed present on sandy soils and coastal bluffs until adequate surveys are conducted.

Table 3-4
Other species of potential concern known or expected to occur on Point Loma Navy lands

Scientific Name	Common Name	Federal ^a	State ^b	NDDB ^c / CNPS ^d
<i>Aphanisma blitoides</i> ^e	Aphanisma	C2	N	G2, S2.1 3 / ?-?-2
<i>Canissonia lewisii</i>	Lewis's evening primrose	N	N	P-1B, 3-3-2
<i>Chorizanthe fimbriata</i> var. <i>fimbriata</i>	Fringed spineflower	N	N	P-4, 1-2-2
<i>Lotus nuttallianus</i> ^e	Nuttall's lotus	C2	N	G1, S1.1 2 / 2-3-1
<i>Chorizanthe procumbens</i> var. <i>procumbens</i>	Pala spineflower	N	N	P-4, 1-2-2
<i>Jepsonia parryi</i>	Coast jepsonia	N	N	P-4, 1-2-1
<i>Microseris douglasii</i> ssp. <i>platycarpa</i>	Small-flowered microseris	N	N	P-1B, ?-?-?
<i>Nemaacaulis denudata</i> var. <i>denudata</i>	Coast woolly-heads	N	N	P-2, ?-?-3
<i>Piperia cooperi</i>	Cooper's rein orchid	N	N	
<i>Quercus dumosa</i>	Coastal scrub oak	N ^f	N	P-1B, 3-3-2

^a U.S. Fish and Wildlife Service Categories of threat and endangerment

- E – Endangered
- T – Threatened

C1 – Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as threatened or endangered.

C2 – Category 2: Taxa for which existing information indicates it may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

C3(a) – Category 3: Taxa more common than previously thought, no longer being considered for a listing proposal at this time.

^b State Listed Plants

- N – Not listed
- E – Endangered
- T – Threatened
- R – Rare

(table continues)

Table 3-4 (continued)

- ° Natural Diversity Data Base Priority Ranks
- Global Ranks (worldwide status)
- G1 – Extremely endangered
- G2 – Endangered
- G3 – Restricted range, rare
- G4 – Apparently secure
- G5 – Demonstrably secure
- State Ranks (status within the state)
- S1 – Extremely endangered
- S2 – Endangered
- S3 – Restricted range, rare
- S4 – Apparently secure
- S5 – Demonstrably secure

A more precise degree of threat is often expressed by a decimal point followed by a number from 1 to 3. The number 1 represents the highest level of threat, and the number 3 represents the lowest level of threat. A question mark indicates that insufficient information is available or that uncertainty exists over the level of threat.

^d The California Native Plant Society (CNPS) lists of sensitive plants.

- P – Proposed for inclusion in the CNPS Inventory of Rare Plants (5th edition)
- List 1A – Plants presumed extinct in California
- List 1B – Plants rare, threatened, or endangered in California and elsewhere
- List 2 – Plants rare, threatened, or endangered in California but more common elsewhere
- List 3 – Plants about which more information is needed - a review list
- List 4 – Plants of limited distribution - a watch list

The California Native Plant Society R-E-D Code

Rarity (R)

- 1 – Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time
- 2 – Occurrence confined to several populations or to one extended population
- 3 – Occurrence limited to one or a few highly restricted populations, or present in such small numbers that it is seldom reported

Endangerment (E)

- 1 – Not endangered
- 2 – Endangered in a portion of its range
- 3 – Endangered throughout its range

(table continues)

Table 3-4 (continued)

Distribution (D)

- 1 – More or less widespread outside California
- 2 – Rare outside California
- 3 – Endemic to California

^e May be placed on List 1B in the new CNPS Inventory of Rare and Endangered Vascular Plants (Fifth Edition).

^f Under consideration for listing as a C2 (Fred Roberts, pers. com. 1992).

Orcutt's spineflower is a Category 1 Federal Candidate species for listing as threatened or endangered status. As of May 1992, the USFWS was evaluating the status of Orcutt's spineflower for listing as endangered (Skinner 1992). The service has subsequently added Orcutt's spineflower to a listing package for plants associated with the southern maritime chaparral vegetation type (Zemba 1992). The CDFG has listed Orcutt's spineflower as endangered in the state of California. The California NDDB ranks this species as extremely endangered on a global basis and extremely endangered in the state. The current CNPS Inventory lists Orcutt's spineflower as presumed extirpated (List 1A) but plans to place Orcutt's spineflower on List 1B in the Fifth Edition of its inventory (Skinner 1992). CNPS now considers Orcutt's spineflower to be limited to one or a few highly restricted populations; or to be present in such small numbers that it is seldom reported, is endangered throughout its range, and is endemic to California.

3.2.2 Federal Candidate Plant Species

Seven plant species that are known to occur or to have occurred on the Point Loma Navy lands are candidates for listing as threatened or endangered by the USFWS (Table 3-3). Candidates for listing are classified in two categories. For Category 1 species, enough information is on file to support their listing as threatened or endangered. Of the species under consideration in this inventory (Table 3-3), only Orcutt's spineflower (*Chorizanthe orcuttiana*) is included in Category 1. Species that are under consideration for listing but for which insufficient information is on file to support federal listing are included in Category 2. The wart-stemmed ceanothus (*Ceanothus verrucosus*), coast wall flower (*Erysimum ammophilum*), the San Diego barrel cactus (*Ferocactus viridescens*), snake cholla (*Opuntia parryi* var. *serpentina*), Torrey pine (*Pinus torreyana*), and the short-lobed broomrape (*Orobanche parishii* ssp. *brachyloba*) are Category 2 candidate species for listing. Two other Category 2 candidate species, the aphanisma (*Aphanisma blitoides*) and Nuttall's lotus (*Lotus nuttallianus*), are listed by Beauchamp (1986) and the California NDDB (1992) as having occurred historically on Point Loma. These species were not observed during either this 1992 survey or the WCC 1981 survey, but should be addressed in site-specific surveys if the NEPA documentation process is required. While candidate species are not legally protected by the Endangered Species Act, they should be considered in environmental documentation since they may be listed at any time.

Ceanothus verrucosus (Wart-Stemmed Ceanothus)

The wart-stemmed ceanothus occurs in chaparral vegetation from the foothills of the Sierra Juarez and Sierra San Pedro Martir in Baja California, north to the coastal portion of San Diego County. This species generally blooms between December and June and often in the early part of this period. It may be easily identified at any time of the year from vegetative features. On the Point Loma Navy lands, wart-stemmed ceanothus is a common component of the southern maritime chaparral vegetation type. Some chaparral stands on the site are dominated by dense thickets of this species. The distribution of wart-stemmed ceanothus on the site is nearly the same as the distribution of southern maritime chaparral. Due to this close relationship, all areas mapped as southern maritime chaparral should be considered to contain wart-stemmed ceanothus unless shown to be absent by site-specific surveys.

While the wart-stemmed ceanothus is not currently listed as threatened or endangered under state or federal law, it is a Category 2 candidate species under consideration for listing by the USFWS. The CNPS includes the wart-stemmed ceanothus in List 2, which contains those plants considered to be rare, threatened, or endangered in California, but more common elsewhere (Smith and Berg 1988). Information provided by Smith and Berg (1988) indicates that this species is rare but is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; that it is endangered within a portion of its range; and that it is more or less widespread outside of California.

***Erysimum ammophilum* (Coast Wallflower)**

The coast wallflower occurs on sandy soils near the coast in San Diego County and on Santa Rosa Island (Munz 1974). On the Point Loma Navy lands, the coast wallflower occurs at scattered locations, primarily on sandy soils. The coast wallflower blooms between February and May. Surveying for it should be conducted when both flowers and fruit are present.

The coast wallflower is a Category 2 candidate species for listing as threatened or endangered by the USFWS. It is not currently listed by the state of California. The CNPS indicates that this species is rare but is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; that it is endangered within a portion of its range; and that it is found only in California (Smith and Berg 1988).

***Ferocactus viridescens* (San Diego Barrel Cactus)**

The San Diego barrel cactus occurs in western San Diego County and northwestern Baja California (Wiggins 1980). On the Point Loma Navy lands, it occurs as scattered individuals and clumps in open areas in undisturbed native vegetation. It is most common in the Diegan coastal sage scrub, maritime succulent scrub, and southern coastal bluff scrub types. This species usually blooms in May and June but can be easily identified at any time of the year.

Although the San Diego barrel cactus is not currently listed as threatened or endangered by the USFWS or the CDFG, it is a Category 2 candidate for federal listing. The California NDDDB (1992) considers both its global and state endangerment status as rare and of restricted range. The CNPS includes it in List 2 of its inventory; and as such it is considered to be rare, threatened, or endangered in California but more common elsewhere. The CNPS currently considers this species to be rare, but it is found in sufficient numbers and distributed widely enough that the potential for its extinction is low at this time. It is considered to be endangered throughout its range and more or less widespread outside of California (Smith and Berg 1988).

***Opuntia parryi* var. *serpentina* (Snake Cholla)**

The snake cholla occurs from the Balboa Park area in the city of San Diego south into northern Baja California. It occurs in scattered locations throughout the Point Loma Navy lands (map set 2) and is most common on well-drained, south-facing slopes. The snake cholla is a variety of the more widely distributed valley cholla (*Opuntia parryi* var. *parryi*). It may be distinguished from the valley cholla by the tendency for its branches to spread along the ground or rise at a

shallow angle. This tendency varies between populations, and the plants on Point Loma tend to have somewhat more erect stems than many San Diego County populations. The juvenile forms of the snake cholla and the coastal cholla (*Opuntia prolifera*) are very similar in appearance, and small plants of these two species are difficult to distinguish. During the 1992 survey, individuals that could not be clearly segregated were considered to be snake cholla. Site-specific surveys for the snake cholla should be conducted from April to May when the chance of finding the flowers and fruit is highest.

The snake cholla is a Category 2 candidate for listing as threatened or endangered by the USFWS but is not listed by the state of California. The snake cholla has been included in a listing package by the USFWS and could be listed at any time (Zembal 1992). The California NDDDB (1992) considers the snake cholla to be endangered globally and to be extremely endangered in the state of California. The California NDDDB designation of endangerment status is an indicator of agency concern but is not equivalent to listing of a species as rare, threatened, or endangered by the CDFG. NDDDB endangerment designations have no legal status. CNPS considers the snake cholla to be limited to one or a few highly restricted populations or present in such small numbers that it is seldom reported; that it is endangered throughout its range; and that it is rare outside of California. This species has been placed on the CNPS List 1B signifying that it is rare, threatened, or endangered in California and elsewhere.

***Pinus torreyana* (Torrey Pine)**

The Torrey pine is known to occur naturally on and near the Torrey Pines State Park and on Santa Rosa Island in Santa Barbara County. Several thousand trees are present in the San Diego County population, and less than 2,000 are present on Santa Rosa Island. While it is unknown if the Torrey pine has occurred naturally on Point Loma, in historic times early reports from the period of the Spanish exploration suggest that it may have been present when Europeans first arrived on the southern California coast (Overton 1992).

During this 1992 survey and the WCC 1981 survey, Torrey pines were observed as components of landscape vegetation. During the 1992 survey, several young Torrey pines were observed growing in areas that showed no sign of having been landscaped. These occurrences were generally in areas dominated by chaparral or maritime sage scrub and often were in open areas surrounded by dense vegetation. It is unlikely that these plants were planted as part of a landscaping effort. Their probable origin is from seed produced by landscape elements and distributed by the wind or wildlife species.

The soils and climate of Point Loma are similar to those present on the Torrey Pines State Park. Since environmental conditions appear to be adequate to support Torrey pines, these individuals may represent the establishment or reestablishment of the species in natural habitats on Point Loma. The seed cones of the Torrey pine are capable of opening without fire (Vogl et al. 1977; Wells 1992), and this factor is not required for the reproduction of the species. Since all the individuals observed were small (less than 10 feet high) and several were seedlings, it is unknown if these trees will survive to become reproductively mature.

The Torrey pine is a Category 2 candidate species for listing as threatened or endangered by the USFWS. As a Category 2 species, the Torrey pine is not protected by federal law but should be

considered in NEPA documents since it could be listed at any time. Consultation with the USFWS is recommended to determine how individuals that have established themselves without human intervention will be treated.

The NDDB ranking for the Torrey pine is extremely endangered both globally and in the state of California. The CNPS indicate that the Torrey pine occurs in one or a few highly restricted populations or is present in such small numbers that it is seldom reported; that it is endangered in a portion of its range, and that it is endemic to California (Smith and Berg 1988). The CNPS has placed this species on its List 1B, which includes those plants that are rare, threatened, or endangered in California and elsewhere.

***Orobanche parishii* ssp. *brachyloba* (Short-Lobed Broomrape)**

The short-lobed broomrape is a small parasitic plant that grows on the roots of the California saltbush (*Atriplex californica*) and coastal isocoma (*Isocoma venetus*). It is known from sandy soils in the San Diego area. On the Point Loma Navy lands, one small population of the broomrape was observed by WCC (1981). The area where it was seen in 1981 has been disturbed by road construction activities. No broomrapes were seen during the 1992 survey. This species generally blooms between May and September.

The short-lobed broomrape is a Category 2 candidate for listing as threatened or endangered by the USFWS and is not listed by the state of California. The California NDDB (1992) considers this species to be endangered in the state of California. The CNPS considers the short-lobed broomrape to be limited to several populations, endangered within a portion of its range, and rare outside of California (Smith and Berg 1988).

3.2.3 Additional Plant Species of Special Concern

***Agave shawii* (Shaw's Agave)**

Shaw's agave is a spiny, rosette-forming succulent species occurring on coastal bluffs and cliffs from Torrey Pines State Reserve in San Diego County to the vicinity of Bahia de Los Angeles in Baja California. Shaw's agave is common along the Baja California coast. Shaw's agave generally blooms from September through May and is easily identified at any time of the year. The 1981 inventory (WCC 1981) indicated that naturally occurring groups of Shaw's agave were present on the Fleet Combat Training Center property. The presence of these plants was confirmed during the 1992 survey. Other groups of Shaw's agave plants, considered by WCC to have been planted, were identified as occurring on the west terrace. In 1992, additional plants were found to have been planted along the city of San Diego's sludge line.

Shaw's agave has no legal status under state or federal law. The California NDDB considers Shaw's agave to have a restricted range and to be rare on a global basis. It considers Shaw's agave to be extremely endangered in California. The CNPS includes Shaw's agave in List 2, which includes those plants considered to be rare, threatened, or endangered in California but more common elsewhere (Smith and Berg 1988). Information provided by Smith and Berg (1988) indicates that this species occurrence is limited to one or a few highly restricted populations; that it is endangered throughout its range; and that it more or less widespread outside of California.

***Bergerocactus emoryi* (Golden-Spined Cereus)**

The golden-spined cereus grows in long-stemmed clumps on dry coastal slopes. This species is common in coastal northern Baja California and on San Clemente and Santa Catalina Islands. It also occurs in southern San Diego County where it is uncommon. This species generally blooms in May and June but can be identified from vegetative characters at any time of the year. Of the two occurrences reported by WCC (1981), the 1992 survey effort relocated the large group growing adjacent to the parking lot on the Naval Command and Ocean Surveillance center Research, Development, Test, and Evaluation Division (NRaD) parcel, approximately 1,500 feet south of the fence line with the Fleet Combat Training Center (Appendix A). This group of plants was in good condition, and several seedlings were growing at the edge of the parking lot on previously cleared land. A group of plants identified in 1981 (WCC 1981) growing near the fence of the Fort Rosecrans Cemetery (Appendix A) was not relocated in 1992. Hottentot fig is now a major component of the ground cover at this site. Other occurrences of golden-spined cereus plants were detected during the 1992 survey (Appendix A).

The golden-spined cereus has no legal status under state or federal law. The California NDDB considers the golden-spined cereus to have a restricted range and to be rare on a global basis. The California NDDB considers it to be endangered in California. The CNPS includes the golden-spined cereus in List 2, which contains those plants considered to be rare, threatened, or endangered in California but more common elsewhere (Smith and Berg 1988). Information provided by the CNPS indicates that this species occurrence is limited to several populations; that it is endangered within a portion of its range; and that it is more or less widespread outside of California (Smith and Berg 1988).

***Calandrinia maritima* (Sea Kisses)**

Sea kisses are small, somewhat succulent annual plants that occur in sandy places and on sea bluffs in the coastal portion of San Diego County and northern Baja California. No occurrences of sea kisses were reported in the 1981 Inventory (WCC 1981). Pacific Southwest Biological Services (1988) reported a population of 200 to 300 individuals near the canyon northwest of the existing baseball field on the submarine base. A single individual was observed during the 1992 survey effort (Appendix A). This individual was dried out and beginning to disintegrate when observed in June. It is likely there are more occurrences of this species on the Point Loma Navy lands. Such occurrences would be most easily detected during the March to May blooming period.

The CNPS includes sea kisses in List 4 of its inventory. This indicates that it is a species of limited distribution in California whose vulnerability appears to be low at this time. Additional data are needed on these plants to determine their true status. The CNPS recommends that their populations be monitored regularly (Skinner 1992). Information provided by the CNPS indicated that this species is rare, but it is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; that it is endangered within a portion of its range; and that it is more or less widespread outside of California (Smith and Berg 1988).

Corethrogyne filaginifolia var. *incana* (San Diego Sand Aster)

The San Diego sand aster occurs on sandy, disturbed areas from the Del Mar area south at least to the international boundary with Mexico (Beauchamp 1986). WCC (1981) indicated that on Point Loma it grows mostly on the sandy Marina/Carlsbad soils capping the peninsula. The San Diego sand aster blooms from January to June, and surveys for it are best conducted in this time frame. This species is most common on disturbed sites on Point Loma and often grows along roadsides and at the interface between areas disturbed by development where chaparral vegetation once existed.

Changes in the taxonomy on the San Diego sand aster are going to be published in the new Jepson Flora of California (Skinner 1992). Plants previously referred to as *Corethrogyne filaginifolia* var. *incana* will be placed in the broader taxa *Lessingia filaginifolia* var. *filaginifolia*. The effect of this change on the status of these plants is currently unknown and will be determined by the botanical and regulatory communities. The CNPS will not recognize this taxonomic change in the upcoming Fifth Edition of its inventory. Navy resource managers should maintain contact with the various regulatory agencies and the CNPS to determine how this conflict will be resolved.

The San Diego sand aster is not listed by federal or state agencies as threatened or endangered. The CNPS currently includes this species in List 4, the watch list. CNPS has, however, proposed changing it to List 1B, which contains those plants that are rare, threatened, or endangered in California and elsewhere. CNPS currently considers this species to be rare, but it is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time. It is considered to be endangered within a portion of its range and rare outside of California.

The preference of the San Diego sand aster for disturbed sites and its abundant seed production makes it a good candidate for addition to revegetation seed mixes to be used on sandy soils. The most appropriate source of seed for such efforts would be from plants growing on Point Loma or from plants originating on Point Loma. At this time, care should be taken not to introduce genetic material from other locations.

Coreopsis maritima (San Diego Sea Dahlia)

The San Diego sea dahlia occurs on coastal bluffs from Oceanside (Beauchamp 1986) south to the area around San Quintin in Baja California (Wiggins 1980). This species generally blooms between March and May, and surveys for it should be conducted in this period. On the Point Loma Navy lands, it was observed on cliffs and steep north-facing slopes (WCC 1981). During the 1992 survey, it was found on a variety of sites on the peninsula. The largest concentrations were noted in Diegan coastal sage scrub and maritime succulent scrub at the tip of Point Loma.

The San Diego sea dahlia currently is not listed by federal or state agencies as threatened or endangered. The CNPS includes it in List 2 of the CNPS Inventory, and as such, it is considered to be rare, threatened, or endangered in California but more common elsewhere. The CNPS rarity and endangerment information indicates that the San Diego sea dahlia occurrences are limited to several populations; that it is endangered within a portion of its range; and that it is more or less widespread outside of California.

***Dichondra occidentalis* (Western Ponyfoot)**

Western ponyfoot occurs as scattered populations in Orange and San Diego Counties and on southern California islands (Munz 1974). It is typically found as an understory herb in chaparral and coastal sage scrub vegetation. Although the flowering of this species is unimportant in field identification, surveys for it are best conducted during the spring while it is in a leafy stage of development. On the Point Loma Navy lands, it occurs in several scattered locations (Appendix A).

Western ponyfoot was reviewed by the USFWS and was placed in Category 3C. This ranking indicates that it is considered too widespread and/or not sufficiently threatened to warrant listing. The CNPS includes it on List 4, the watch list, but does not consider it to be currently in danger of extirpation. Information provided by the CNPS (Smith and Berg 1988) indicates that this species is rare, but it is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; that it is endangered within a portion of its range; and that it is more or less widespread outside of California.

***Euphorbia misera* (Cliff Spurge)**

Cliff spurge grows on coastal bluffs from Dana Point (NDDDB 1992) south into central Baja California (Wiggins 1980). Cliff spurge usually blooms between January and August but can easily be identified at any time of the year. On the Point Loma Navy lands, cliff spurge is a common component of the Diegan coastal sage scrub and maritime succulent scrub vegetation subtypes. Along with other maritime sage scrub associates, it also occurs in southern coastal bluff scrub. In some areas, cliff spurge is sufficiently common to be considered a locally dominant species. Due to its widespread distribution on the study site, it should be considered as present in these vegetation types until shown to be absent by site-specific surveys.

Cliff spurge is not currently listed as threatened or endangered by the USFWS or the CDFG. The CNPS includes it in List 2 of its inventory, and as such, it is considered to be rare, threatened, or endangered in California but more common elsewhere. The CNPS rarity and endangerment information indicates that the cliff spurge occurrences are limited to several populations; that it is endangered within a portion of its range; and that it is more or less widespread outside of California.

***Fritillaria biflora* (Chocolate Lily)**

The chocolate lily occurs from Mendocino and Napa Counties through California and as far south as Ensenada in Baja California. It is most often found in grassland vegetation on heavy, clay soils. One occurrence of the chocolate lily on the Point Loma Navy lands was noted by WCC (1981). This species was not seen during the 1992 survey. This species blooms between January and April and should be searched for when in bloom.

Neither federal nor state agencies list the chocolate lily as threatened or endangered, and the Fourth Edition of the CNPS Inventory considered it too common to be included. The CNPS is now proposing to place this species on List 4, the watch list, in the upcoming Fifth Edition of the rare plant inventory (Skinner 1992). If included, it will be considered to be rare but found

in sufficient numbers and distributed widely enough that the potential for extinction is low at this time. It also will be considered to be endangered within a portion of its range and found only in California.

Selaginella cinerascens (Ashy Spike-Moss)

The ashy spike-moss occurs in San Diego County and northern Baja California south to Santo Tomas. It grows as a mat of slender stems that lay flat on the surface of the soil. This species is very distinctive and can be easily identified at any season. No flowers are produced on this moss-like plant.

The ashy spike-moss is not listed as threatened or endangered by either the state or federal governments. The CNPS has placed it on List 4, the watch list, and does not consider it to be in danger at this time. Information provided by the CNPS indicates that this species is rare, but it is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; that it is endangered within a portion of its range; and that it is more or less widespread outside of California (Smith and Berg 1988).

Viguiera laciniata (San Diego Sunflower)

The San Diego sunflower occurs in San Diego County and northern Baja California. On the Point Loma Navy properties, it occurs in a few limited areas. WCC (1981) suggested that this species may have been used in revegetation seed mixes. Observations made during this 1992 field survey tend to support this concept. Although this species occurs naturally at a few locations on the immediate coast, it is more common a few miles inland.

The San Diego sunflower is not listed as threatened or endangered by state or federal agencies. The CNPS includes it in List 2 of the inventory signifying that it is considered to be rare, threatened, or endangered in California but more common elsewhere. Information provided by the CNPS indicates that this species is rare, but it is found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time; that it is endangered within a portion of its range; and that it is more or less widespread outside of California (Smith and Berg 1988).

3.2.4 Plant Species of Potential Concern

The rapid development of the southern California coastal area has resulted in the loss of large amounts of habitat in the last 10 years. In light of these losses, the status of some species previously considered to be sufficiently common not to require special attention is being reevaluated by the scientific community. In addition, taxonomic studies have been conducted that require the reevaluation of some species formerly thought to be common.

A variety of species that are known historically to have occurred on Point Loma are being proposed for inclusion in the Fifth Edition of the CNPS Inventory (Table 3-4). None of these species were reported to be present by WCC (1981), nor were they observed during this 1992 field survey. It is recommended that Navy resource managers be made aware of the increased

interest in these species and that their legal status be monitored on a regular basis. When project-related, site-specific surveys are planned, efforts should be made to locate these species as well as those listed in Table 3-3. None of these plants is currently listed by federal or state agencies, and they are not protected by law.

The aphanisma (*Aphanisma blitoides*) is reported to have occurred on Point Loma (NDDB 1992). Its habitat is alkaline areas near the coast and sea bluffs. This species occurs as far north as Point Sal in Santa Barbara County (NDDB 1992) and as far south as the Vizcaino Desert in Baja California (Wiggins 1980). Its normal bloom period is between April and May, and surveys for this species should be conducted during this time frame.

Aphanisma is a Category 2 candidate species for listing by the USFWS. The CDFG has not listed this species. The California NDDB (1992) considers it to be endangered globally and endangered in the state of California. The CNPS included the aphanisma in List 3, which contains plants about which more information is needed (Smith and Berg 1988).

Although not recorded as present during this 1992 survey or the WCC 1981 survey, aphanisma should be considered a species potentially present on the Point Loma Navy lands. Site-specific surveys conducted in appropriate habitat should address the potential for this species to occur in the area surveyed.

Nuttall's lotus (*Lotus nuttallianus*) also has been reported to occur on Point Loma (NDDB 1992). Its habitat is coastal bluffs and sandy beaches (Wiggins 1980). Nuttall's lotus occurs from Oceanside, California (NDDB 1992), to the vicinity of Ensenada, Baja California. This species blooms from March through June, and surveys for it should be conducted during this period.

Nuttall's lotus is a Category 2 candidate species for listing by the USFWS. The CDFG has not listed this species. The California NDDB (1992) indicates that it is extremely endangered globally and in the state of California. The CNPS included this species in List 2 of its inventory and, as such, considers it to be rare, threatened, and endangered in California but more common elsewhere (Smith and Berg 1988). The CNPS assessment of its rarity indicates that its occurrence is limited to a few scattered populations; that it is endangered throughout its range; and that it is more or less widespread outside of California.

Although not recorded as present during this 1992 survey or the WCC 1981 survey, Nuttall's lotus should be considered a species potentially present on the Point Loma Navy lands. Site-specific surveys conducted in appropriate habitat should address the potential for this species to occur in the area surveyed for specific projects.

3.3 WILDLIFE COMMUNITY

The USFWS considers Point Loma to be a major wildlife resource of regional significance (Zemba 1992). The importance of the area to a variety of wildlife species is due to the quality, abundance, and diversity of habitats present and its coastal position adjacent to the Pacific Ocean and San Diego Bay. Point Loma has remained relatively undeveloped because of the Navy's presence and the designation of the southernmost tip as a national monument. Point Loma contains remnants of sensitive plant communities that have been dramatically reduced within southern California (Zemba 1992). These communities support a number of sensitive resident

animal species. All areas of natural habitat on Point Loma are considered to have very high wildlife values (Zemba 1992). Eight species of reptiles and amphibians, 15 species of small and large mammals, and over 300 species of birds are known to inhabit Point Loma or use portions of the peninsula seasonally (Table 3-5).

Vegetation and habitat types on Point Loma Navy lands are described in detail in Section 3.1. Upland wildlife habitats include southern maritime chaparral, maritime sage scrub (Diegan coastal sage scrub, maritime succulent scrub), southern coastal bluff scrub, grassland, landscape, and disturbed vegetation. The chaparral and scrub vegetation types provide diverse habitat for a variety of reptile, avian, and small mammal species. Common residents using these habitat types on Point Loma include the western fence lizard (*Occidentalis sceloporus*), California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), northern mockingbird (*Mimus polyglottos*), California towhee (*Pipilo crissalis*), and gray fox (*Urocyon cinereoargenteus*). Upland habitats on Point Loma provide foraging areas for predatory bird species such as the common raven (*Corvus corax*), American kestrel (*Falco sparverius*), and loggerhead shrike (*Lanius ludovicianus*).

Lowland wildlife habitats consist of foredune vegetation and the intertidal zone. The few sandy beaches and sheltered bays present on Point Loma are important as roosting and feeding areas for a variety of water birds. These habitats are mapped as Seabird Congregation and Heron Roosting Areas (Appendix A). Typical species that use this habitat include herons (*Ardea* and *Casmerodius* sp.), gulls (*Larus* sp.), cormorants (*Phalacrocorax* sp.), and the California brown pelican (*Pelicanus occidentalis californicus*). California sea lions (*Zalophus californianus*) forage in the coastal waters adjacent to Point Loma and haul out on floating platforms near the degaussing station. These platforms are mapped as a California Sea Lion Haul Out Area (Appendix A).

Point Loma's rocky shoreline and tide pools provide a rich foraging area for many bird species, particularly during the migratory season. Typical species that use this habitat include the black turnstone (*Arenaria melanocephala*), sanderling (*Calidris alba*), willet (*Catoptrophorus semipalmatus*), and whimbrel (*Numenius phaeopus*). The sea cliffs provide roosting and nesting sites for such species as the barn swallow (*Hirundo rustica*), and historically, the American peregrine falcon (*Falco peregrinus anatum*) (Unitt 1984). Sea cliffs are mapped as Seabird Roosting Cliffs (Appendix A).

Sources of freshwater on Point Loma are limited. Some catchment basins contain water on an intermittent basis. Most of these are formed by runoff from Fort Rosecrans National Cemetery. The TransDec Pool is a permanent source of fresh water accessible to most wildlife since the area is only partially fenced. During this 1992 survey, cliff swallows (*Hirundo pyrrhonata*) were observed drinking from this pool and foraging for insects above its surface.

The USFWS considers Point Loma to be a significant component of the Pacific flyway with more than 250 species of birds using the area during migration (Zemba 1992). The point is a major migratory landmark, particularly in the fall when many species of birds move south via the Pacific flyway. Both native and nonnative habitats on Point Loma provide cover and resting areas for migratory bird species (Zemba 1992).

Table 3-5
Wildlife known to occur on Point Loma

Scientific Name	Common Name
Amphibians and Reptiles	
<i>Batrachoseps pacificus major</i>	Pacific slender salamander
<i>Eumeces skiltonianus interparietalis</i>	Coronado skink ^a
<i>Cnemidophorus hyperythrus</i>	Orange-throated whiptail ^b
<i>Gerrhonotus multicarinatus webbi</i>	San Diego alligator lizard ^b
<i>Sceloporus occidentalis</i>	Western fence lizard ^b
<i>Uta stansburiana</i>	Side-blotched lizard ^b
<i>Lampropeltis getulus californiae</i>	California kingsnake ^c
<i>Masticophis lateralis lateralis</i>	Chaparral whipsnake (striped racer) ^c
Birds	
<i>Gavia immer</i>	Common loon
<i>Gavia pacifica</i>	Pacific loon ^a
<i>Gavia Stellata</i>	Red-throated loon
<i>Aechmophorus clarkii</i>	Clark's grebe
<i>Podiceps auritus</i>	Horned grebe
<i>Podiceps nigricollis</i>	Eared grebe ^a
<i>Aechmophorus occidentalis</i>	Western grebe ^b
<i>Pidilymbus podiceps</i>	Pied-billed grebe
<i>Fulmarus glacialis</i>	Northern fulmar
<i>Puffinus creatopus</i>	Pink-footed shearwater
<i>Puffinus griseus</i>	Sooty shearwater
<i>Puffinus tenuirostris</i>	Short-tailed shearwater ^d
<i>Puffinus opisthomelas</i>	Black-vented shearwater
<i>Oceanodroma melania</i>	Black storm-petrel
<i>Oceanodroma homochroa</i>	Ashy storm-petrel ^d
<i>Oceanodroma microsoma</i>	Least storm-petrel ^d
<i>Pelicanus occidentalis californicus</i>	California brown pelican ^b
<i>Pelicanus erythrorhynchos</i>	American white pelican ^d
<i>Phalacrocorax auritus</i>	Double-crested cormorant ^b
<i>Phalacrocorax penicillatus</i>	Brandt's cormorant ^b
<i>Phalacrocorax pelagicus</i>	Pelagic cormorant ^a
<i>Fregata magnificens</i>	Magnificent frigatebird ^d
<i>Ardea herodias</i>	Great blue heron ^{b,e}
<i>Nycticorax nycticorax</i>	Black-crowned night heron ^{b,e}
<i>Butorides striatus</i>	Green-backed heron ^d
<i>Casmerodius albus</i>	Great egret ^c
<i>Egretta thula</i>	Snowy egret ^b
<i>Bubulcus ibis</i>	Cattle egret

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Eudocimus albus</i>	White ibis ^d
<i>Branta bernicla nigricans</i>	Black brant
<i>Branta canadensis</i>	Canada goose ^d
<i>Anser albifrons</i>	Greater white-fronted goose ^d
<i>Chen caerulescens</i>	Snow goose ^d
<i>Anas erecca</i>	Green-winged teal
<i>Anas platyrhynchos</i>	Mallard
<i>Anas acuta</i>	Northern pintail
<i>Anas discors</i>	Blue-winged teal
<i>Anas cyanoptera</i>	Cinnamon teal
<i>Anas clypeata</i>	Northern shoveler
<i>Aythya affinis</i>	Lesser scaup
<i>Bucephala albeola</i>	Bufflehead ^a
<i>Bucephala clangula</i>	Common goldeneye ^{a,d}
<i>Melanitta nigra</i>	Black scoter ^d
<i>Melanitta perspicillata</i>	Surf scoter ^b
<i>Melanitta fusca</i>	White-winged scoter
<i>Clangula hyemalis</i>	Oldsquaw
<i>Mergus serrator</i>	Red-breasted merganser ^a
<i>Oxyura jamaicensis</i>	Ruddy duck
<i>Laterallus jamaicensis coturniculus</i>	California black rail ^d
<i>Porzana carolina</i>	Sora ^d
<i>Fulica maericana</i>	American coot
<i>Pluvialis squatarola</i>	Black-bellied plover ^a
<i>Pluvialis dominica</i>	Lesser golden plover ^d
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover ^d
<i>Charadrius semipalmatus</i>	Semipalmated plover
<i>Charadrius vociferus</i>	Killdeer
<i>Haematopus palliatus</i>	American oystercatcher ^d
<i>Haematopus bachmani</i>	Black oystercatcher ^a
<i>Himantopus mexicanus</i>	Black-necked stilt
<i>Recurvirostra americana</i>	American avocet ^d
<i>Tringa melanoleuca</i>	Greater yellowlegs
<i>Tringa solitarius</i>	Solitary sandpiper ^d
<i>Cataporphorus semipalmatus</i>	Willet ^b
<i>Heteroscelus incanus</i>	Wandering tattler ^a
<i>Actitis macularis</i>	Spotted sandpiper ^a
<i>Numenius phaeopus</i>	Whimbrel ^a
<i>Numenius americanus</i>	Long-billed curlew

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Limosa fedoa</i>	Marbled godwit
<i>Arenaria interpres</i>	Ruddy turnstone ^a
<i>Arenaria melanocephala</i>	Black turnstone ^a
<i>Aphriza virgata</i>	Surfbird
<i>Calidris canutus</i>	Red knot
<i>Calidris alba</i>	Sanderling ^a
<i>Calidris mauri</i>	Western sandpiper
<i>Calidris minutilla</i>	Least sandpiper
<i>Calidris alpina</i>	Dunlin
<i>Limnodromus griseus</i>	Short-billed dowitcher ^c
<i>Limnodromus scolopaceus</i>	Long-billed dowitcher
<i>Phalaropus lobatus</i>	Red-necked phalarope
<i>Phalaropus fulicaria</i>	Red phalarope ^d
<i>Stercorarius pomarinus</i>	Pomarine jaeger
<i>Stercorarius parasiticus</i>	Parasitic jaeger
<i>Larus atricilla</i>	Laughing gull ^d
<i>Larus philadelphia</i>	Bonaparte's gull ^a
<i>Larus heermanni</i>	Heermann's gull ^b
<i>Larus delawarensis</i>	Ring-billed gull ^a
<i>Larus canus</i>	Mew gull
<i>Larus californicus</i>	California gull ^a
<i>Larus argentatus</i>	Herring gull
<i>Larus thayeri</i>	Thayer's gull
<i>Larus occidentalis</i>	Western gull ^{b, e}
<i>Larus glaucescens</i>	Glaucous-winged gull
<i>Larus hyperboreus</i>	Glaucous gull ^d
<i>Rissa tridactyla</i>	Black-legged kittiwake
<i>Xema sabini</i>	Sabine's gull ^d
<i>Rynchops niger</i>	Black skimmer ^d
<i>Sterna caspia</i>	Caspian tern
<i>Sterna maxima</i>	Royal tern
<i>Sterna elegans</i>	Elegant tern
<i>Sterna hirundo</i>	Common tern
<i>Sterna forsteri</i>	Forster's tern ^b
<i>Sterna antillarum browni</i>	California least tern
<i>Chlidonias niger</i>	Black tern ^d
<i>Uria aalge</i>	Common murre
<i>Synthliboramphus hypoleucus</i>	Xantus' murrelet ^d
<i>Cerorhina monocerata</i>	Rhinoceros auklet ^d

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Cathartes aura</i>	Turkey vulture
<i>Pandion haliaetus</i>	Osprey
<i>Elanus caeruleus</i>	Black-shouldered kite
<i>Ictinia mississippiensis</i>	Mississippi kite ^d
<i>Haliaeetus leucocephalus</i>	Bald eagle ^d
<i>Circus cyaneus</i>	Northern harrier
<i>Accipiter striatus</i>	Sharp-shinned hawk ^a
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo lineatus</i>	Red-shouldered hawk ^e
<i>Buteo platypterus</i>	Broad-winged hawk ^d
<i>Buteo swainsonii</i>	Swainson's hawk ^{a,d}
<i>Buteo albonotatus</i>	Zone-tailed hawk ^d
<i>Buteo jamaicensis</i>	Red-tailed hawk ^b
<i>Buteo regalis</i>	Ferruginous hawk ^d
<i>Aquila Chrysaetus</i>	Golden eagle ^d
<i>Falco mexicanus</i>	Prairie falcon
<i>Falco peregrinus anatum</i>	American peregrine falcon
<i>Falco columbarius</i>	Merlin
<i>Falco sparverius</i>	American kestrel ^{b,*}
<i>Callipepla californica</i>	California quail ^{b,*}
<i>Columba fasciata</i>	Band-tailed pigeon
<i>Columa livia</i>	Rock dove ^{b,*}
<i>Zenaida asiatica</i>	White-winged dove ^c
<i>Zenaida macroura</i>	Mourning dove ^{b,*}
<i>Columbina passerina</i>	Common ground-dove ^d
<i>Streptopelia chinensis</i>	Spotted dove
<i>Tyto alba</i>	Common barn owl ^c
<i>Bubo virginianus</i>	Great horned owl ^e
<i>Athene cunicularia</i>	Burrowing owl ^d
<i>Asio otis</i>	Long-eared owl ^d
<i>Asio flammeus</i>	Short-eared owl ^d
<i>Phalaenoptilus nuttallii</i>	Common poorwill ^d
<i>Chordeiles acutipennis</i>	Lesser nighthawk
<i>Caprimulgus vociferus</i>	Whip-poor-will ^d
<i>Cypseloides niger</i>	Black swift ^d
<i>Chaetura pelagica</i>	Chimney swift ^d
<i>Chaetura vauxi</i>	Vaux's swift
<i>Aeronautes saxatalis</i>	White-throated swift ^a
<i>Archilochus alexandri</i>	Black-chinned hummingbird ^e

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Calypte costae</i>	Costa's hummingbird ^{a,*}
<i>Calypte anna</i>	Anna's hummingbird ^{b,*}
<i>Stellula calliope</i>	Calliope hummingbird
<i>Selasphorus sasin</i>	Allen's hummingbird ^a
<i>Selasphorus rufus</i>	Rufous hummingbird
<i>Selasphorus platycerus</i>	Broad-tailed hummingbird ^d
<i>Ceryle aclyon</i>	Belted kingfisher ^a
<i>Melanerpes lewis</i>	Lewis' woodpecker ^d
<i>Melanerpes formicivorus</i>	Acorn woodpecker
<i>Sphyrapicus varius</i>	Yellow-bellied sapsucker ^d
<i>Sphyrapicus (varius) nuchalis</i>	Red-naped sapsucker
<i>Sphyrapicus ruber</i>	Red-breasted sapsucker
<i>Picoides nuttallii</i>	Nuttall's woodpecker ^d
<i>Picoides villosus</i>	Hairy woodpecker ^d
<i>Picoides pubescens</i>	Downy woodpecker ^d
<i>Colaptes auratus</i>	Common flicker ^{a,*}
<i>Contopus borealis</i>	Olive-sided flycatcher
<i>Contopus pertnax</i>	Greater pewee ^d
<i>Contopus sordidulus</i>	Western pewee
<i>Empidonax traillii</i>	Willow flycatcher ^d
<i>Empidonax minimus</i>	Least flycatcher
<i>Empidonax hammondi</i>	Hammond's flycatcher
<i>Empidonax oberholseri</i>	Dusky flycatcher
<i>Empidonax wrightii</i>	Gray flycatcher
<i>Empidonax difficilis</i>	Western flycatcher
<i>Sayornis nigricans</i>	Black phoebe ^{b,*}
<i>Sayornis saya</i>	Say's phoebe ^a
<i>Sayornis phoebe</i>	Eastern phoebe ^d
<i>Pyrocephalus rubinus</i>	Vermilion flycatcher ^d
<i>Myiarchus cinerascens</i>	Ash-throated flycatcher ^{b,*}
<i>Myiarchus crinitus</i>	Great crested flycatcher ^d
<i>Myiodynastes luteiventris</i>	Sulphur-bellied flycatcher ^d
<i>Tyrannus mealncholicus</i>	Tropical kingbird ^d
<i>Tyrannus vociferans</i>	Cassin's kingbird ^{c,*}
<i>Tyrannus crassirostris</i>	Thick-billed kingbird ^d
<i>Tyrannus verticalis</i>	Western kingbird ^a
<i>Tyrannus tyrannus</i>	Eastern kingbird ^d
<i>Tyrannus forficatus</i>	Scissor-tailed flycatcher ^d
<i>Eremophila alpestris actia</i>	California horned lark

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Tachycineta thalassina</i>	Violet-green swallow
<i>Tachycineta bicolor</i>	Tree swallow
<i>Stelgicopteryx serripennis</i>	Northern rough-winged swallow ^a
<i>Riparia riparia</i>	Bank swallow ^d
<i>Hirundo pyrrhonota</i>	Cliff swallow ^{b,*}
<i>Hirundo rustica</i>	Barn swallow ^{b,*}
<i>Progne subis</i>	Purple martin
<i>Cyanocitta stelleri</i>	Steller's jay ^d
<i>Aphelocoma caerulescens</i>	Scrub jay ^{b,*}
<i>Nucifraga columbiana</i>	Clark's nutcracker ^d
<i>Corvus brachyrhynchos</i>	American crow
<i>Corvus corax</i>	Common raven ^{b,*}
<i>Parus gambeli</i>	Mountain chickadee ^d
<i>Parus inornatus</i>	Plain titmouse ^d
<i>Psaltriparus minimus</i>	Bushtitz ^{b,*}
<i>Sitta carolinensis</i>	White-breasted nuthatch
<i>Sitta canadensis</i>	Red-breasted nuthatch
<i>Sitta pygmaea</i>	Pygmy nuthatch
<i>Certhia americana</i>	Brown creeper ^d
<i>Campylorhynchus brunneicapillus</i>	Cactus wren
<i>Salpinctes obsoletus</i>	Rock wren
<i>Thryomanes bewickii</i>	Bewick's wren ^{b,*}
<i>Troglodytes aedon</i>	House wren ^a
<i>Troglodytes troglodytes</i>	Winter wren
<i>Cistothorus palustris</i>	Marsh wren
<i>Regulus satrapa</i>	Golden-crowned kinglet
<i>Regulus calendula</i>	Ruby-crowned kinglet ^a
<i>Polioptila caerulea</i>	Blue-gray gnatcatcher
<i>Sialia mexicana</i>	Western bluebird
<i>Sialia currucoides</i>	Mountain bluebird
<i>Myadestes townsendi</i>	Townsend's solitaire
<i>Catharus ustulatus</i>	Swainson's thrush
<i>Catharus minimus</i>	Gray-cheeked thrush
<i>Catharus guttatus</i>	Hermit thrush ^a
<i>Hylocichla mustelina</i>	Wood thrush ^d
<i>Turdus migratorius</i>	American robin ^a
<i>Isoreus naevius</i>	Varied thrush ^d
<i>Cahnaea fasciata</i>	Wrentit ^{b,*}
<i>Dumetella carolinensis</i>	Gray catbird ^d

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Mimus polyglottus</i>	Northern mockingbird ^{b,*}
<i>Oreoscoptes montanus</i>	Sage thrasher
<i>Toxostoma rufum</i>	Brown thrasher ^d
<i>Toxostoma bendirei</i>	Bendire's thrasher ^d
<i>Toxostoma redivivum</i>	California thrasher ^{b,*}
<i>Anthus cervinus</i>	Red-throated pipit ^d
<i>Anthus rubescens</i>	American pipit
<i>Bombycilla cedrorum</i>	Cedar waxwing
<i>Phainopepla nitens</i>	Phainopepla
<i>Lanius ludovicianus</i>	Loggerhead shrike ^{b,*}
<i>Sturnus vulgaris</i>	European starling ^{b,*}
<i>Vireo griseus</i>	White-eyed vireo ^d
<i>Vireo bellii pusillus</i>	Least Bell's vireo ^d
<i>Vireo solitarius</i>	Solitary vireo
<i>Vireo buttoni</i>	Hutton's vireo
<i>Vireo olivaceus</i>	Red-eyed vireo
<i>Vireo gilvus swainsonii</i>	Warbling vireo
<i>Vireo philadelphicus</i>	Philadelphia vireo ^d
<i>Vireo flavifrons</i>	Yellow-throated vireo ^d
<i>Vermivora pinus</i>	Blue-winged warbler ^d
<i>Vermivora pergrina</i>	Tennessee warbler
<i>Vermivora celata sordida</i>	Orange-crowned warbler ^{b,*}
<i>Vermivora ruficapilla</i>	Nashville warbler
<i>Vermivora virginiae</i>	Virginia's warbler ^d
<i>Vermivora luciae</i>	Lucy's warbler ^d
<i>Parula americana</i>	Northern Parula ^d
<i>Dendroica petechia rubigino</i>	Yellow warbler
<i>Dendroica pensylvanica</i>	Chestnut-sided warbler ^d
<i>Dendroica magnolia</i>	Magnolia warbler ^d
<i>Dendroica tigrina</i>	Cape may warbler ^d
<i>Dendroica caerulescens</i>	Black-throated blue warbler ^d
<i>Dendroica coronata</i>	Yellow-rumped warbler ^a
<i>Dendroica nigrescens</i>	Black-throated gray warbler
<i>Dendroica townsendi</i>	Townsend's warbler
<i>Dendroica occidentalis</i>	Hermit warbler
<i>Dendroica virens</i>	Black-throated green warbler ^d
<i>Dendroica fusca</i>	Blackburnian warbler ^d
<i>Dendroica dominica</i>	Yellow-throated warbler ^d
<i>Dendroica graciae</i>	Grace's warbler ^d

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Dendroica pinus</i>	Pine warbler ^d
<i>Dendroica discolor</i>	Prairie warbler ^d
<i>Dendroica palmarum</i>	Palm warbler ^d
<i>Dendroica castanea</i>	Bay-breasted warbler ^d
<i>Dendroica striata</i>	Blackpoll warbler ^d
<i>Dendroica cerulea</i>	Cerulean warbler ^d
<i>Mniotilta varia</i>	Black-and-white warbler ^d
<i>Setophaga ruticilla</i>	American redstart
<i>Protonotaria citrea</i>	Prothonotary warbler ^d
<i>Helmitheros vermivorus</i>	Worm-eating warbler ^d
<i>Seiurus aurocapillus</i>	Ovenbird
<i>Seiurus noveboracensis</i>	Northern waterthrush ^d
<i>Oporornis formosus</i>	Kentucky warbler ^d
<i>Oporornis agilis</i>	Connecticut warbler ^d
<i>Oporornis philadelphia</i>	Mourning warbler ^d
<i>Oporornis tolmiei</i>	MacGillivray's warbler ^a
<i>Geothlypis trichas</i>	Common yellowthroat
<i>Wilsonia citrina</i>	Hooded warbler ^d
<i>Wilsonia canadensis</i>	Canada warbler ^d
<i>Wilsonia pusilla</i>	Wilson's warbler ^a
<i>Cardellina rubrifrons</i>	Red-faced warbler
<i>Myioborus pictus</i>	Painted redstart ^d
<i>Icteria virens</i>	Yellow-breasted chat
<i>Piranga ludoviciana</i>	Western tanager ^a
<i>Piranga rubra rubra</i>	Summer tanager
<i>Piranga olivacea</i>	Scarlet tanager ^d
<i>Piranga flava hepatica</i>	Hepatic tanager ^d
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak
<i>Pheucticus melanocephalus</i>	Black-headed grosbeak
<i>Guiraca caerulea</i>	Blue grosbeak
<i>Passerina cyanea</i>	Indigo bunting
<i>Passerina amoena</i>	Lazuli bunting
<i>Passerina ciris</i>	Painted bunting ^d
<i>Spiza americana</i>	Dickcissel
<i>Pipilo chlorurus</i>	Green-tailed towhee
<i>Pipilo erythrophthalmus megalonyx</i>	Rufous-sided towhee ^{b,*}
<i>Pipilo crissalis</i>	California towhee ^{b,*}
<i>Amphispiza belli</i>	Sage sparrow ^d
<i>Amphispiza bilineata</i>	Black-throated sparrow ^d

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Spizella arborea</i>	American tree sparrow ^d
<i>Spizella passerina arizonae</i>	Chipping sparrow ^{a,e}
<i>Spizella pallida</i>	Clay-colored sparrow
<i>Spizella breweri</i>	Brewer's sparrow
<i>Spizella atrogularis</i>	Black-chinned sparrow
<i>Aimophila reficeps lambi</i>	Rufous-crowned sparrow ^e
<i>Calamospiza melanocorys</i>	Lark bunting ^d
<i>Passerculus sandwichensis</i>	Savannah sparrow ^a
<i>Ammodramus savannarum perpallidus</i>	Grasshopper sparrow ^d
<i>Ammodramus bairdii</i>	Baird's sparrow
<i>Poocetes gramineus</i>	Vesper sparrow
<i>Chondestes grammacus</i>	Lark sparrow
<i>Passerella iliaca</i>	Fox sparrow
<i>Melospiza melodia cooperi</i>	Song sparrow ^{b,e}
<i>Melospiza lincolni</i>	Lincoln's sparrow ^a
<i>Melospiza georgiana</i>	Swamp sparrow ^d
<i>Zonotrichia albicollis</i>	White-throated sparrow
<i>Zonotrichia altricapilla</i>	Golden-crowned sparrow ^a
<i>Zonotrichia leucophrys</i>	White-crowned sparrow ^a
<i>Zonotrichia guerula</i>	Harris' sparrow ^d
<i>Junco hyemalis</i>	Dark-eyed junco ^a
<i>Calcarius lapponicus</i>	Lapland longspur ^d
<i>Calcarius ornatus</i>	Chesnut-collared longspur ^d
<i>Dolichonyx oryzivorus</i>	Bobolink ^d
<i>Agelaius phoeniceus</i>	Red-winged blackbird
<i>Agelaius tricolor</i>	Tricolored blackbird
<i>Sturnella neglecta</i>	Western meadowlark ^a
<i>Xanthocephalus xanthocephalus</i>	Yellow-headed blackbird ^d
<i>Icterus spurius</i>	Orchard oriole ^d
<i>Icterus cucullatus nelsoni</i>	Hooded oriole ^{a,e}
<i>Icterus galbula</i>	Northern oriole ^{a,e}
<i>Icterus parsiorum</i>	Scott's oriole
<i>Euphagus carolinus</i>	Rusty blackbird ^d
<i>Euphagus cyanocephalus minusculus</i>	Brewer's blackbird ^{b,e}
<i>Molothrus ater obscurus</i>	Brown-headed cowbird ^e
<i>Carpodacus purpureus</i>	Purple finch
<i>Carpodacus cassinii</i>	Cassin's finch ^d
<i>Carpodacus mexicanus</i>	House finch ^{b,e}
<i>Loxia curvirostra</i>	Red crossbill

(table continues)

Table 3-5 (continued)

Scientific Name	Common Name
Birds	
<i>Carduelis pinus</i>	Pine siskin
<i>Carduelis tristis</i>	American goldfinch
<i>Carduelis psaltria hesperophilus</i>	Lesser goldfinch ^{b,e}
<i>Carduelis lawrencei</i>	Lawrence's goldfinch
<i>Coccothraustes vespertinus</i>	Evening grosbeak ^d
<i>Passer domesticus</i>	House sparrow ^{b,e}
Mammals	
<i>Canis latrans</i>	Coyote ^e
<i>Didelphis virginiana</i>	Virginia opossum ^e
<i>Microtus californicus sanctidiegi</i>	California vole ^a
<i>Mus musculus</i>	House mouse ^a
<i>Neotoma lepida</i>	Desert woodrat ^a
<i>Perognathus fallax (Chaetodipus)</i>	San Diego pocket mouse ^a
<i>Peromyscus boylii rowleyi</i>	Brush mouse ^a
<i>Peromyscus californicus insignis</i>	California mouse ^a
<i>Peromyscus eremicus</i>	Cactus mouse ^a
<i>Peromyscus maniculatus</i>	Deer mouse ^a
<i>Spermophilus beecheyi</i>	California ground squirrel ^b
<i>Sylvilagus audubonii</i>	Desert cottontail ^b
<i>Thomomys bottae</i>	Botta's pocket gopher
<i>Urocyon cinereoargenteus</i>	Gray fox ^b
<i>Zalophus californianus</i>	California sea lion ^e

^a Observed during 1981 surveys.

^b Observed during 1981 and 1992 surveys.

^c Observed during 1992 surveys.

Other sightings from Claude G. Edwards (1987, 1988) and Pacific Southwest Biological Services, Inc. (1988).

^d Indicates bird species considered to be rare, unusual, or otherwise worth noting.

^e Indicates bird species that are known to nest on Point Loma.

3.4 SENSITIVE WILDLIFE SPECIES

The term "sensitive wildlife species" denotes those animals that are currently listed or under consideration for listing by various federal, state, and local agencies and institutions as rare, threatened, or endangered. Federal and state listed species are protected under the Federal Endangered Species Act of 1973 as amended, California Endangered Species Act of 1984, or the California Environmental Quality Act of 1970. Although some sensitive species have no legal status under federal law, they may be protected by state or local ordinances, and they may represent unique resources.

Eighteen sensitive wildlife species are considered resident and 41 species occur seasonally on Point Loma (Table 3-6). Ten additional sensitive species are considered as potential residents on Point Loma (Table 3-7). Although not recorded as present during this 1992 survey or the WCC 1981 survey, these 10 species are likely to occur on Point Loma because suitable habitat is present. Small mammal live-trapping and species-specific surveys for bats, reptiles, and the California gnatcatcher could indicate whether these species do or do not reside on Point Loma. The following sections describe resident and potentially resident sensitive species, their legal status, habitats, and locations on Point Loma (Appendix A).

3.4.1 Federal and State Listed Threatened and Endangered Wildlife Species

An endangered species is defined by the Endangered Species Act, as amended, as "any species which is in danger of extinction throughout all or a significant portion of its range other than species of the class Insecta determined by the Secretary of the Interior to constitute a pest whose protection under the provisions of this Act would present an overwhelming and overriding risk to man." A threatened species is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The following discussion examines federal and state listed threatened and endangered species occurring/observed on Point Loma.

Charadrius alexandrinus nivosus (Western Snowy Plover)

The western snowy plover was proposed for listing as threatened under the Federal Endangered Species Act, as amended, in January 1992. It was listed as threatened on March 5, 1993. The state of California designates the western snowy plover as a Species of Special Concern. This subspecies of the snowy plover ranges along the Pacific coast from Washington south into Baja California (Udvardy 1988).

The western snowy plover occurs primarily on sandy ocean beaches and around the drying margins of lagoons. Snowy plovers nest in shallow scrapes made on beach dunes, dried mudflats, and bare dirt dikes and fills (Unitt 1984). The snowy plover forages at the water's edge or among scattered debris on the upper beach (Wilds 1988).

In recent years, a limited amount of nesting has been documented at North Island Naval Air Station across from Point Loma (Unitt 1984). No nesting attempts have been reported from Point Loma. However, a secluded strip of beach near the degaussing pier provides potential nesting and foraging habitat for the western snowy plover. This relatively undisturbed beach was

Table 3-6
Sensitive wildlife known to occur on Point Loma

Scientific Name	Common Name	Status ^a	Residency ^b
Amphibians and Reptiles			
<i>Eumeces skiltonianus interparietalis</i>	Coronado skink ^c	SC, C2	R
<i>Cnemidophorus hyperythrus</i>	Orange-throated whiptail ^d	SC, C2	R
Birds			
<i>Gavia immer</i>	Common loon	SC	M
<i>Aechmophorus occedentalis</i>	Western grebe ^d	SA	M
<i>Oceanodroma melania</i>	Black storm-petrel	SC	M
<i>Oceanodroma homochroa</i>	Ashy storm-petrel	SC	M
<i>Pelicanus occidentalis californicus</i>	California brown pelican ^d	SE, FE	R
<i>Pelicanus erythrorhynchos</i>	American white pelican	SC	M
<i>Phalacrocorax auritus</i>	Double-crested cormorant ^d	SC	R
<i>Ardea herodias</i>	Great blue heron ^d	SA	R
<i>Nycticorax nycticorax</i>	Black-crowned night heron ^d	SA	R
<i>Casmerodius albus</i>	Great egret ^e	SA	R
<i>Egretta thula</i>	Snowy egret ^d	SA	R
<i>Bucephala albeola</i>	Bufflehead ^c	SA	M
<i>Laterallus jamaicensis coturniculus</i>	California black rail	ST, 3C	M
<i>Charadrius alexandrinus nivosus</i>	Western snowy plover	SC, FT	R
<i>Numenius americanus</i>	Long-billed curlew	SC, C2	M
<i>Larus atricilla</i>	Laughing gull	SC	M
<i>Larus californicus</i>	California gull ^c	SC	M
<i>Rynchops niger</i>	Black skimmer	SC	M
<i>Sterna caspia</i>	Caspian tern	SA	R
<i>Sterna elegans</i>	Elegant tern	SC, C2	R
<i>Sterna forsteri</i>	Forster's tern ^d	SA	M
<i>Sterna antillarum browni</i>	California least tern	SE, FE	R
<i>Synthliboramphus hypoleucus</i>	Xantus' murrelet	SA, C2	M
<i>Cerorhina monocerata</i>	Rhinoceros auklet	SC	M
<i>Pandion haliaetus</i>	Osprey	SC	M
<i>Elanus caeruleus</i>	Black-shouldered kite	SA	M
<i>Haliaeetus leucocephalus</i>	Bald eagle	SE, FE	M
<i>Circus cyaneus</i>	Northern harrier	SC	M
<i>Accipiter striatus</i>	Sharp-shinned hawk ^c	SC	M
<i>Accipiter cooperii</i>	Cooper's hawk	SC	M
<i>Buteo swainsonii</i>	Swainson's hawk ^c	ST	M
<i>Buteo regalis</i>	Ferruginous hawk	SC, C2	M
<i>Aguila chrysaetus</i>	Golden eagle	SC	M
<i>Falco mexicanus</i>	Prairie falcon	SC	M

(table continues)

Table 3-6 (continued)

Scientific Name	Common Name	Status ^a	Residency ^b
Birds			
<i>Falco peregrinus anatum</i>	American peregrine falcon	SE, FE	R
<i>Falco columbarius</i>	Merlin	SC	M
<i>Athene cunicularia</i>	Burrowing owl	SC	M
<i>Asio otis</i>	Long-eared owl	SC	M
<i>Asio flammeus</i>	Short-eared owl	SC	M
<i>Cypseloides niger</i>	Black swift	SC	M
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher	SE, C1	M
<i>Eremophila alpestris actia</i>	California horned lark	C2	R
<i>Riparia riparia</i>	Bank swallow	ST	M
<i>Progne subis</i>	Purple martin	SC	M
<i>Campylorhynchus brunneicapillus covesi</i>	San Diego cactus wren	SC, C2	M
<i>Toxostoma bendirei</i>	Bendire's thrasher	SC	M
<i>Lanius ludovicianus</i>	Loggerhead shrike ^d	C2	R
<i>Vireo bellii pusillus</i>	Least Bell's vireo	SE, FE	M
<i>Vermivora virginiae</i>	Virginia's warbler	SC	M
<i>Icteria virens</i>	Yellow-breasted chat	SC	M
<i>Piranga rubra rubra</i>	Summer tanager	SC	M
<i>Piranga flava hepatica</i>	Hepatic tanager	SC	M
<i>Amphispiza belli</i>	Sage sparrow	C2	M
<i>Aimophila ruficeps canescens</i>	Southern California Rufous-crowned sparrow	C2	R
<i>Agelaius tricolor</i>	Tricolored blackbird	SC, C2	M
Mammals			
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat ^f	C2	R
<i>Perognathus fallax fallax (Chaetodipus)</i>	Northwestern San Diego pocket mouse ^e	C2	R

^a Status codes:

- | | |
|----------------------------------|--|
| C1 – Federal Category 1 | PE – Proposed federal endangered |
| C2 – Federal Category 2 | SA – California special animal |
| 3C – Federal Category 3 | SC – California species of special concern |
| FE – Federal endangered | SE – State endangered |
| FT – Federal threatened | ST – State threatened |
| PT – Proposed federal threatened | |

^b Residency codes:

M indicates species that occur on Point Loma as migrants, vagrants, visitors, or casual or accidental sightings.
R indicates species that historically or currently occur on or near Point Loma as summer or year-round residents.

^c Observed during 1981 surveys.

^d Observed during 1981 and 1992 surveys.

^e Observed during 1992 surveys.

Other sightings from Claude G. Edwards (1988) and Pacific Southwest Biological Services, Inc. (1988).

Table 3-7
Sensitive wildlife species that may be present on Point Loma

Scientific Name	Common Name	Status ^a
Amphibians and Reptiles		
<i>Cnemidophorus tigris multiscutatus</i>	Coastal western whiptail	C2
<i>Phrynosoma coronatum blainvillei</i>	San Diego horned lizard	SC, C2
<i>Crotalus ruber ruber</i>	Northern red diamond rattlesnake	SC, C2
<i>Diadophis punctatus similis</i>	San Diego ringneck snake	C2
<i>Lichanura trivirgata rosafusca</i>	Coastal rosy boa	C2
<i>Salvadora hexalepis virgulata</i>	Coast patch-nosed snake	SC, C2
Birds		
<i>Poliophtila californica californica</i>	California gnatcatcher	SC, T
Mammals		
<i>Perognathus longimembris pacificus</i>	Pacific little pocket mouse	SC, C2
<i>Eumops perotis californicus</i>	Greater western mastiff bat	SC, C2
<i>Macrotus californicus</i>	California leaf-nosed bat	SC, C2

^a Status codes:

C2 – Federal Category 2

SC – California species of special concern

T – Federal threatened

described as a seabird congregation and heron roosting area during this 1992 survey (Appendix A). The snowy plover was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Falco peregrinus anatum* (American Peregrine Falcon)**

The peregrine falcon is a federal and state designated endangered species. Historically, this falcon ranged across North America. Present migratory and winter ranges on the Pacific coast include most of California, excluding deserts. Nesting areas in California include the Channel Islands, southern and central coastal areas, inland north coastal mountains, Klamath and Cascade mountain ranges, and the Sierra Nevada mountains (CDFG 1991b). Typical nesting sites are ledges of large cliff faces, but some pairs nest on city buildings and bridges (CDFG 1991b).

Habitats used by the peregrine falcon are varied, including wetlands and coastal areas, woodlands, cities, and agricultural areas (CDFG 1991b). Peregrine falcons are most frequently

seen along the coastline, particularly near mudflats, shores, and ponds where large numbers of birds congregate (Unitt 1984). By diving from above, they hunt birds such as doves, pigeons, shorebirds, and waterfowl (Steinhart 1990).

Historically, peregrine falcon nest sites in San Diego County included Point Loma (Unitt 1984). In 1982, 1983, 1986, and 1987, young captive-bred peregrine falcons were released into the wild from the cliff face at Battery Humphrey on Point Loma (Platter-Rieger 1992). Although no nesting attempts on Point Loma have been reported, there are occasional sightings of peregrine falcons in the area. The peregrine falcon was not observed during this 1992 survey or the WCC 1981 survey. A pair of peregrine falcons nested in recent years on the Coronado Bridge east of Point Loma. If the species recovers in southern California, and San Diego County in particular, it is possible that the peregrine falcon may again nest on the cliff faces of Point Loma.

***Pelicanus occidentalis californicus* (California Brown Pelican)**

The California brown pelican is a federal and state designated endangered species. This subspecies of the brown pelican ranges throughout the Southern California Bight. Between breeding seasons, the brown pelican may range as far north as British Columbia, and as far south as Central America (CDFG 1991b). The California brown pelican nests colonially on the Channel Islands and along the coast of Baja California (CDFG 1991b).

In California, the brown pelican forages within a few kilometers of shore on coastal saltwater and open ocean (Unitt 1984). It dives from the air on surface-schooling fishes, such as Pacific mackerel, Pacific sardine, and northern anchovy. During the breeding season, more than 90 percent of the brown pelican's diet consists of anchovy (CDFG 1991b).

California brown pelicans were observed foraging in the coastal waters adjacent to Point Loma during this 1992 survey and the WCC 1981 survey. Numerous brown pelicans also were observed at Seabird Congregation Areas and Roosting Cliffs (Appendix A).

***Polioptila californica californica* (California Gnatcatcher)**

In September 1991, the California gnatcatcher was proposed for listing as endangered under the Federal Endangered Species Act, as amended. On March 25, 1993, the U.S. Fish and Wildlife Service announced that the California gnatcatcher would be listed as threatened. The listing became effective on that day (Babbs 1993). On March 30, 1993, the listing was published in the Federal Register (Babbs 1993).

The state of California currently designates the California gnatcatcher as a Species of Special Concern. The California gnatcatcher's range is restricted to coastal southern California and northwestern Baja California from Los Angeles County (formerly Ventura and San Bernardino Counties) south to 30°N latitude (Atwood 1990). The California gnatcatcher is an obligate resident of the coastal sage scrub plant community (Atwood 1990). In San Diego County,

California gnatcatchers show strong positive preferences for California sagebrush (*Artemisia californica*), flat-top buckwheat (*Eriogonum fasciculatum*), broom baccharis (*Baccharis sarothroides*), and laurel sumac (*Malosma laurina*) (Mock et al. 1990).

Surveys conducted by Bontrager (1991) in Orange County identified the types of scrub habitat usually unoccupied by adult resident California gnatcatchers. The California gnatcatcher did not occur in coastal sage scrub dominated by black sage (*Salvia mellifera*). In addition, chaparral and chaparral/coastal sage scrub mixes were used rarely. The California gnatcatcher was also absent from typical coastal sage scrub habitats if a major component of the area contained large woody shrubs such as lemonade berry (*Rhus integrifolia*) and/or laurel sumac (*Malosma laurina*) (Bontrager 1991).

The California gnatcatcher prefers relatively open stands of coastal sage scrub (Bontrager 1991). Dominant plant species recorded in mapped territories of California gnatcatchers were generally 1 meter high or less (Atwood 1990). The percent gap in shrub canopy for California gnatcatcher home ranges in one San Diego County study area averaged 38.1 percent (ERC Environmental and Energy Services Co. [ERCE] 1990). Atwood (1990) related his impression that California gnatcatchers avoid dense and/or high stands of coastal sage scrub that otherwise resemble, in floristic composition, nearby areas that are used by the birds.

Coastal sage scrub is frequently subject to fire. Results of a study in Riverside County indicated that California gnatcatcher territories were located in areas of coastal sage scrub that had burned eight or nine years previously (Tattersall 1988). More recently burned areas, as well as older, unburned habitat, were unoccupied.

The average home range size for California gnatcatchers in one inland San Diego County study area was 23.8 acres (ERCE 1990). Home range sizes at coastal sites are generally much smaller and less variable in size than at inland sites (Mock et al. 1990). An average home range size of 3 acres per pair was found on the immediate coast at Camp Pendleton, San Diego County (Atwood 1984).

An unconfirmed sighting of two California gnatcatchers was reported on the southern boundary of the Pacific Fleet Combat Training Center in the fall of 1991 (Scheidt 1992). Another unconfirmed sighting of a California gnatcatcher was reported from the Naval Submarine Base (Subase) in mid-August of 1992 (Dossey 1992). Three additional unconfirmed California gnatcatcher sightings were reported from the Subase in mid-September of 1992 (Dossey 1992). The California gnatcatcher was not observed on Point Loma during this 1992 survey or the WCC 1981 survey. Due to the contract period, this 1992 survey was conducted during June, July, August, and September. Ideally, California gnatcatcher surveys should occur between January and March when breeding territories are being established but before the onset of egg-laying and incubation.

***Sterna antillarum browni* (California Least Tern)**

The California least tern is a federal and state designated endangered species. This subspecies of the least tern arrives on the California coast in April and departs in August for wintering grounds in Latin America (CDFG 1991b). The nesting range extends along the Pacific coast from San Francisco Bay to southern Baja California (Steinhart 1990).

California least terns nest colonially in shallow scrapes made on bare or sparsely vegetated flat substrates such as beaches, sandbars, dry mudflats, alkali flats, and man-made surfaces such as landfills (CDFG 1991b; Steinhart 1990; Unitt 1984). Nesting areas are preferably located near estuaries, bays, or harbors where small fish are present. California least terns feed exclusively by diving on small fish such as anchovies, topsmelt, and grunion (Steinhart 1990).

One of San Diego County's documented nesting colonies is located near the runways at North Island Naval Air Station across from Point Loma (Unitt 1984). No nesting attempts have been reported from Point Loma. However, a secluded strip of beach near the degaussing pier may provide potential nesting habitat for the California least tern. The results of this 1992 survey indicated this relatively undisturbed beach was a Seabird Congregation and Heron Roosting Area (Appendix A). The California least tern was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

3.4.2 Federal Candidate Wildlife Species

The Endangered Species Act, as amended, defines a Category 2 listing as: "comprises taxa for which information now in the possession of the USFWS indicates that proposing to list as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat are not currently available to support proposed rules." The following discussion examines Category 2 species occurrence/absence on Point Loma.

***Eumeces skiltonianus interparietalis* (Coronado Skink)**

The Coronado skink is a federal designated Category 2 candidate species and a California Species of Special Concern. This subspecies of the western skink is restricted to southern California from San Diego County south into northern Baja California (Behler and King 1989).

Preferred habitats include forest, open woodland, broken chaparral, and grassy areas, especially where rocks are abundant (Behler and King 1989; Stebbins 1985). Individuals are usually found under leaf litter, logs, or rocks. The Coronado Skink forages for a variety of insects, their larvae, spiders, and earthworms (Behler and King 1989).

One Coronado skink was observed during the 1981 survey on Point Loma Navy lands (WCC 1981). The Coronado skink was not observed during the 1992 survey.

***Cnemidophorus hyperythrus* (Orange-Throated Whiptail)**

The orange-throated whiptail is a federal designated Category 2 candidate species and a California Species of Special Concern. It ranges from southern California west of the Peninsular Ranges south to the tip of Baja California. It occurs at elevations from sea level to approximately 2,000 feet (Stebbins 1985).

Preferred habitats are arid and semiarid areas such as chaparral, thornscrub, and streamsides where sand or loose soil, patches of brush, and rocks are present (Behler and King 1989; Stebbins 1985). Prey items include spiders and a variety of insects, particularly termites (Behler and King 1989).

Four orange-throated whiptails were observed during the WCC 1981 survey and two were observed during this 1992 survey (Appendix A). Several orange-throated whiptails were observed in 1991 on the ocean boundary of the Pacific Fleet Combat Training Center (Scheidt 1992).

***Cnemidophorus tigris multiscutatus* (Coastal Western Whiptail)**

The coastal western whiptail is a federal designated Category 2 candidate species. This subspecies of the western whiptail ranges from coastal southern California south into Baja California (Behler and King 1989; Stebbins 1985).

Preferred habitats for the western whiptail are areas where vegetation is sparse, ranging from arid and semiarid desert to open woodlands (Behler and King 1989). It avoids dense grassland and thick growth of shrubs (Stebbins 1985). The western whiptail digs burrows for retreats and to find underground prey. Prey items include insects, scorpions, and spiders (Behler and King 1989). The coastal western whiptail was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Phrynosoma coronatum blainvillei* (San Diego Horned Lizard)**

The San Diego horned lizard is a federal designated Category 2 candidate species and a California Species of Special Concern. This subspecies of the coast horned lizard is localized in coastal southern California from Los Angeles County south to Baja California (Behler and King 1989).

Preferred habitats include scrubland and arid lowland regions with friable soils and low-growing shrubs. Other requirements are warmth, particularly open areas for sunning; patches of fine loose soil where it can bury itself; and ants and other insect prey (Stebbins 1985). During the winter months, horned lizards lie dormant, buried in the soil, resuming activity in April. The San Diego horned lizard was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Crotalus ruber ruber* (Northern Red Diamond Rattlesnake)**

The northern red diamond rattlesnake is a federal designated Category 2 candidate species and a California Species of Special Concern. This subspecies of the red diamond rattlesnake ranges from the cool coastal zone of southern California, into the foothills, over the Peninsular Ranges into the desert, and south to the cape of Baja California (Stebbins 1985).

Preferred habitats include desert scrub, thorn scrub, chaparral, and woodlands where brush-covered boulders and cactus patches are present. The northern red diamond rattlesnake is occasionally found in grassland and cultivated areas (Stebbins 1985). Prey items include rabbits, ground squirrels, and birds (Behler and King 1989).

An unconfirmed sighting of a northern red diamond rattlesnake was reported on the Naval Submarine Base during the spring of 1992 (Platter-Rieger 1992). However, the northern red diamond rattlesnake was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Diadophis punctatus similis* (San Diego Ringneck Snake)**

The San Diego ringneck snake is a federal designated Category 2 candidate species. This subspecies of the ringneck snake ranges from southwestern San Bernardino County south into Baja California (Behler and King 1989).

Preferred habitats include moist situations in forest, grassland, rocky wooded hillsides, chaparral, upland desert near streams, farms, and gardens (Behler and King 1989; Stebbins 1985). The ringneck snake is seldom seen in the open. It is usually found on the ground under bark, beneath and inside rotten logs, and under stones and boards (Stebbins 1985). Prey items include salamanders, frogs, lizards, snakes, slugs, and worms (Stebbins 1985).

An unconfirmed sighting of a San Diego ringneck snake was reported during the spring of 1992 at the Submarine Base child development center (Platter-Rieger 1992). The San Diego ringneck snake was not observed during this 1992 survey or the WCC 1981 survey.

***Lichanura trivirgata rosafusca* (Coastal Rosy Boa)**

The coastal rosy boa is a federal designated Category 2 candidate species. This subspecies of the rosy boa is restricted to extreme southwestern California and northern Baja California (Behler and King 1989).

The rosy boa inhabits desert arid scrub, brushland, and rocky chaparral-covered foothills (Behler and King 1989). It is attracted to permanent or intermittent streams, but does not require permanent water (Stebbins 1985). This nocturnal constrictor preys on small mammals and birds (Behler and King 1989). The coastal rosy boa was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Salvadora hexalepis virgulata* (Coast Patch-Nosed Snake)**

The coast patch-nosed snake is a federal designated Category 2 candidate species and a California Species of Special Concern. This subspecies of the western patch-nosed snake ranges in coastal California from San Luis Obispo County south into northwestern Baja California (Behler and King 1989).

The western patch-nosed snake inhabits grassland, barren creosote bush desert flats, sagebrush semidesert, chaparral, and piñon-juniper woodland (Behler and King 1989; Stebbins 1985). This fast-moving diurnal species preys on lizards, young snakes, pocket mice, and reptile eggs (Behler and King 1989). The coast patch-nosed snake was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Aimophila ruficeps canescens* (Southern California Rufous-Crowned Sparrow)**

The southern California rufous-crowned sparrow is a federal designated Category 2 candidate species. This subspecies of the rufous-crowned sparrow is restricted to southwestern California from Santa Barbara County south into northwestern Baja California (Unitt 1984).

The rufous-crowned sparrow is a characteristic resident of coastal sage scrub, preferring scrub areas that are steep and rocky and/or have scattered bunches of grass (Unitt 1984). This species is reported to nest on Point Loma (Unitt 1984). The southern California rufous-crowned sparrow was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Lanius ludovicianus* (Loggerhead Shrike)**

The loggerhead shrike is a federal designated Category 2 candidate species. Its range extends across southern Canada, most of the United States, and northern Mexico (Eckert 1988).

The loggerhead shrike prefers open country, such as savanna and desert, with high lookout perches. It is a common resident in agricultural land, desert wash and desert-edge scrub, grassland, beach areas with scattered bushes, or broken chaparral (Unitt 1984). It is found anywhere that expanses of open ground for foraging are located near scattered bushes or low trees for nest sites and perches (Unitt 1984). It preys upon large insects, small birds, mice, and lizards (Udvardy 1988).

The loggerhead shrike is reported to nest on Point Loma (Unitt 1984). The loggerhead shrike was observed on Point Loma Navy lands during this 1992 survey and the WCC 1981 survey. A pair of loggerhead shrikes were observed together several times in the same locality during the 1992 survey (Appendix A). It is likely that these sightings constitute a single pair observed multiple times.

***Eremophila alpestris actia* (California Horned Lark)**

The California horned lark is a federal designated Category 2 candidate species. This subspecies of the horned lark is restricted to the San Diego County coastal slope (Unitt 1984).

Horned larks occur in a variety of habitats including sandy ocean and bay shores, bare ground or among low herbaceous plants, mesas, disturbed areas, grassland, open agricultural land, and sparse creosote brush scrub (Unitt 1984). The California horned lark is reported to nest on Point Loma (Unitt 1984). However, the species was not observed during the 1992 survey or the WCC 1981 survey.

***Sterna elegans* (Elegant Tern)**

The elegant tern is a federal designated Category 2 candidate species and a California Species of Special Concern. It arrives on the California coast in March and departs in late fall; some individuals linger through December (Unitt 1984). The only elegant tern nesting colony outside of Mexico is located on the dikes of the saltworks at the south end of San Diego Bay (Unitt 1984).

Elegant terns are strictly associated with salt water; they seldom range farther inland than the upper ends of coastal lagoons. They often rest in flocks on mudflats, sandbars in lagoons, and beach dunes. This tern forages in bays or the ocean within sight of shore (Unitt 1984).

The elegant tern has been sighted periodically foraging near Point Loma, but it is not known to nest in the area. The elegant tern was not observed during this 1992 survey or the WCC 1981 survey.

***Neotoma lepida intermedia* (San Diego Desert Woodrat)**

The San Diego desert woodrat is a federal designated Category 2 candidate species. This subspecies of the desert woodrat ranges from San Luis Obispo County south into Baja California (Hall 1981b).

The desert woodrat inhabits areas of desert and piñon-juniper woodland, often in the vicinity of rocky outcrops (Jameson and Peters 1988; Whitaker 1988). It also occurs in areas of sagebrush, scrub, and chaparral (Ingles 1989). The desert woodrat uses the abandoned burrows of ground squirrels or kangaroo rats, constructing a house of sticks and cactus spines over the entrance. The nest is placed underground and the house is used for both protection and food storage (Jameson and Peters 1988; Whitaker 1988). The desert woodrat forages for yucca pods, bark, berries, piñon nuts, leaves and seeds of forbs, and cholla and other desert succulents (Jameson and Peters 1988; Whitaker 1988).

The San Diego desert woodrat was live-trapped during the WCC 1981 survey in southern maritime chaparral, Diegan coastal sage scrub, and maritime succulent scrub. Small mammal trapping was not included in the 1992 survey.

***Perognathus (Chaetodipus) fallax fallax* (Northwestern San Diego Pocket Mouse)**

The northwestern San Diego pocket mouse is a federal designated Category 2 candidate species. This subspecies of the San Diego pocket mouse ranges from western San Bernardino County south into Baja California (Hall 1981a).

The San Diego pocket mouse inhabits dry, open, sandy areas of weedy vegetation (Whitaker 1988). It forages for seeds from plants such as the yucca, sage (*Salvia* sp.), ryegrass (*Lolium* sp.), and other grasses (Jameson and Peters 1988). The San Diego pocket mouse becomes inactive in cold weather (Jameson and Peters 1988).

The San Diego pocket mouse was live-trapped during the WCC 1981 survey in southern maritime chaparral, Diegan coastal sage scrub, and maritime succulent scrub. Small mammal trapping was not included in the 1992 survey.

***Perognathus longimembris pacificus* (Pacific Little Pocket Mouse)**

The Pacific little pocket mouse is a federal designated Category 2 candidate species and a California Species of Special Concern. This subspecies of the little pocket mouse is restricted to coastal San Diego and Orange Counties and extreme northwestern Baja California (Hall 1981a).

The little pocket mouse inhabits areas of fine, sandy and gravelly desert soils (Whitaker 1988). It forages for soil-dwelling insects and the seeds of many desert plants, including grasses, goosefoot (*Chenopodium* sp.), and the desert trumpet (*Eriogonum inflatum*) (Jameson and Peters 1988). In California, this species is inactive from October to January (Whitaker 1988).

The Pacific little pocket mouse was not live-trapped during the WCC 1981 survey. Small mammal trapping was not included in this 1992 survey.

***Eumops perotis californicus* (Greater Western Mastiff Bat)**

The greater western mastiff bat is a federal designated Category 2 candidate species and a California Species of Special Concern. Its range includes southern California, extreme southern Nevada, Arizona, southwestern New Mexico and Texas, and northern Baja California and Mexico (Hall 1981a; Whitaker 1988).

This is North America's largest bat and it inhabits open arid areas with high cliffs (Jameson and Peters 1988). It roosts by day in small colonies in crevices of rocky cliffs and canyons as well as in buildings. Roost sites are usually elevated to allow a free downward fall for at least 10 feet to launch into flight. Crevices must be a minimum of 2 inches in width (Whitaker 1988). The greater western mastiff bat forages primarily for moths, but also feeds on dragonflies, beetles, ground-living crickets, long-horned grasshoppers, and hymenopterans (Jameson and Peters 1988; Whitaker 1988). The greater western mastiff bat was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

***Macrotus californicus* (California Leaf-Nosed Bat)**

The California leaf-nosed bat is a federal designated Category 2 candidate species and a California Species of Special Concern. Its range includes southern California, extreme southern Nevada, Arizona, Baja California, and northern Mexico (Hall 1981a; Whitaker 1988).

The California leaf-nosed bat inhabits areas of scrub in arid and semiarid lowlands, roosting by day in abandoned buildings and mine tunnels (Whitaker 1988). It forages for noctuid moths,

orthopterans, and scarabid and carabid beetles (Jameson and Peters 1988). This species does not hibernate (Whitaker 1988). The California leaf-nosed bat was not observed on Point Loma during this 1992 survey or the WCC 1981 survey.

Additional Category 2 Species

The USFWS also expressed concern for seven other federal designated Category 2 candidate species (Zembal 1992). These are the arroyo southwestern toad (*Bufo microscaphus californicus*), California red-legged frog (*Rana aurora draytoni*), two-striped garter snake (*Thamnophis hammondi*), reddish egret (*Egretta rufescens*), harlequin duck (*Histrionicus histrionicus*), western least bittern (*Ixobrychus exilis hesperis*), and spotted bat (*Euderma maculatum*). However, these species are unlikely to occur on Point Loma because suitable habitat is not present.

3.4.3 California Special Animals

The term, "Special Animals," is used by the CDFG to refer to all vertebrate and invertebrate taxa of concern to the NDDDB, regardless of their legal or protection status (CDFG 1991a).

This 1992 survey identified seven California designated Special Animals on Point Loma (Table 3-6). The double-crested cormorant (*Phalacrocorax auritus*) is designated as a California Species of Special Concern. The western grebe (*Aechmophorus occidentalis*), great blue heron (*Ardea herodias*), black-crowned night heron (*Nycticorax nycticorax*), great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), and Caspian tern (*Rynchops niger*) are species designated within one or more of the following categories:

- taxa that are biologically rare, very restricted in distribution, or declining throughout their range;
- population(s) in California that may be peripheral to the major portion of a taxon's range, but which are threatened with extirpation within California; or
- taxa closely associated with a habitat that is declining in California at an alarming rate (CDFG 1991a).

During the 1992 survey, the double-crested cormorant was observed foraging in the coastal waters adjacent to Point Loma and roosting on cliffs and secluded beaches. These areas are mapped as a Seabird Congregation and Heron Roosting Area, Seabird Roosting Cliffs, and Seabird Congregation Areas (Appendix A). The western grebe was observed on Point Loma during the 1992 survey foraging in coastal waters adjacent to the degaussing pier. This sheltered area is mapped as a Seabird Congregation and Heron Roosting Area (Appendix A). During the 1992 survey, the snowy egret was observed foraging in tide pools along the western rocky shoreline of Point Loma. The Caspian tern was not observed during this 1992 survey or the WCC 1981 survey, but has been previously sighted on Point Loma (Edwards 1988).

Great blue herons and black-crowned night herons have occupied separate breeding colonies in mature eucalyptus trees on the Subase on Point Loma since at least 1972 (Unitt 1984) and possibly since the 1950s (Platter-Rieger 1992). Both great blue and black-crowned night heron populations at the Subase appear to be stable and healthy (Platter-Rieger 1991). During 1991,

great blue herons nested at nine localities on the Subase with a total seasonal effort of 82 nests (Platter-Rieger 1991). Black-crowned night herons during 1991 nested at 13 localities on the Subase with a total seasonal effort of 167 nests (Platter-Rieger 1991).

This 1992 survey commenced after the completion of the year's heron nesting effort. During this 1992 survey and the WCC 1981 survey, great blue herons were observed roosting on cliffs and secluded beaches on Point Loma. These areas are mapped as a Seabird Congregation and Heron Roosting Area and Great Blue Heron Roosting Cliffs (Map Set 3). During the 1992 survey, numerous juvenile great blue herons and several great egrets were observed in the broom baccharis (*Baccharis sarothroides*) adjacent to the Seabird Congregation and Heron Roosting Area. Several black-crowned night herons were observed roosting on the McDonald's Restaurant building adjacent to one of the breeding colonies for this species.

CHAPTER FOUR
CONSERVATION ISSUES

4. CONSERVATION ISSUES

Since preparation of the initial survey report (Woodward-Clyde Consultants [WCC] 1981), several resource conservation issues have evolved. These issues include the related concepts of habitat isolation and fragmentation as well as species and habitat diversity. The topics of habitat fragmentation and isolation are closely related to issues such as edge effect, gap analysis, corridor and reserve design, and minimum viable population size. Growing concern about these issues has been expressed by resource agencies, including Navy resource staff.

4.1 HABITAT ISOLATION AND FRAGMENTATION

Wide stretches of urbanized lands between formerly contiguous habitat units act much like water in isolating habitat patches and reducing or preventing dispersal between the isolated units (Soulé et al. 1992). This breaking up of large habitat units into smaller ones by roads, buildings, and other human structures is also referred to as fragmentation. Soulé and Kohm (1989) suggest that fragmentation is a major threat to biodiversity.

The Equilibrium Theory of Island Biogeography (MacArthur and Wilson 1967) predicts that remnants of habitat will lose species at predictable rates. The theory asserts that given sufficient time and no colonization or in situ speciation, the number of species in a remnant will decline asymptotically to zero. The smaller the remnant, the faster the biota should collapse. A small remnant supports smaller species populations which should be more vulnerable to extinction due to stochastic events. Gilpin and Soulé (1986) emphasized the positive feedback relations between deterministic (e.g., habitat loss, predation) and stochastic (e.g., weather, sex ratio variation) factors on isolated populations.

Current evidence supports the contention that density is the primary factor in determining a species' vulnerability to extinction (Bolger et al. 1991). High initial population numbers decrease the likelihood of extinction by random events (MacArthur 1972). Rarity increases the risk of extinction (Soulé et al. 1992). In addition, those species that are generally less abundant in the region are most likely to be absent initially from a habitat remnant due to sampling (Bolger et al. 1991).

Soulé et al. (1992) investigated the effects of habitat fragmentation on birds, rodents, and flowering plants native to the indigenous scrub habitats of coastal San Diego County, California. The results of the Soulé study indicated that the number of native chaparral birds, rodents, and flowering plants that persist in a habitat remnant is not explained, even partially, by the distance between remnants or the distance to the nearest large, unfragmented expanse of scrub habitat (Soulé et al. 1992). The authors concluded that urban barriers such as highways, streets, and structures, impose a very high degree of isolation.

Abundance of the species of interest and number of microhabitats did increase with the size of the native habitat within a remnant. Results suggested that disturbed habitat within a remnant

was not used by the species of interest. The age since isolation (fragmentation) accounted for a large and significant amount of variation in the number of species of interest persisting in the remnant (Soulé et al. 1992).

The study data suggested that interspecific interaction, a deterministic process, may contribute to the extinction of species of interest from a remnant. For instance, the presence of foxes was associated with less persistence for bird species of interest; the presence of coyotes with more. The authors speculated that an absence of coyotes could lead to a numerical response in the populations of carnivores and omnivores that are preyed on by coyotes, a phenomena they refer to as "mesopredator release." Therefore, the absence of coyotes from a remnant could lead indirectly to higher predation rates on smaller prey species, including birds (Soulé et al. 1992).

Results of the Soulé et al. (1992) study indicated limited degrees of differential vulnerability between species. For instance, large-bodied birds apparently persisted longer than smaller species, after correcting statistically for the variation in population density among species. More deeply rooted plant species persisted longer than shallow-rooted species.

The distributions of birds and rodents in remnants revealed an extreme degree of nonrandomness (Bolger et al. 1991). For example, the presence of the road-runner in a remnant was highly predictive of the presence in the same remnant of all other bird species of interest. This nestedness suggests that extinctions occur in a predictable sequence.

Soulé et al. (1988) found that seven bird species native to the indigenous scrub habitats of coastal San Diego County, California, disappeared from habitat remnants in a predictable order, namely the California gnatcatcher, roadrunner, California quail, California thrasher, rufous-sided towhee, Bewick's wren, and wren-tit. Results of this study suggested that the order of disappearance was determined by the abundance/rarity hypothesis; low initial populations numbers increase the likelihood of extinction by random events.

Five of the above bird species were observed on Point Loma during this 1992 survey and the WCC 1981 survey. The California gnatcatcher and the roadrunner were not detected during this 1992 survey or the WCC 1981 survey, and were not listed by Edwards (1988) as occurring on Point Loma.

Based on their study results, Soulé et al. (1992) concluded that habitat remnants in the 10- to 100-hectare range did not retain a full complement of species for more than a few decades, on average. Only the most abundant animal species native to the indigenous scrub habitats survived for very long, and the authors hypothesized that most of those would disappear within a century.

With approximately 633 acres (256 hectares) of wildland habitat present, Point Loma is a moderately sized habitat island. However, it is relatively large compared to the habitat remnants in the above study (Soulé et al. 1992). The larger, more complex mosaic of habitats present on Point Loma may provide sufficient resources for the long-term persistence of those species that occur on the Navy lands.

Point Loma

Habitat fragmentation is occurring within the greater Point Loma habitat island. The construction of roads, building complexes, pipelines, antenna installations, and other structures has divided larger habitat units into smaller ones. Fragmented habitats near urban areas are susceptible to changes in habitat that result from human activity. These changes may include increased or decreased fire frequency, ground surface disturbance, introduction of exotic species, increased presence of humans, and pollution, among other changes. Key aspects of disturbance are patchy character, concentration, frequency, and synergistic nature (Pickett and White 1985). To understand how disturbance may affect a habitat, one needs to understand the structure of the system, the existing resource base, the life history of the component species, the competitive abilities of the species, and the landscape characteristics of the unit under consideration (Pickett and White 1985).

Much of the habitat on Point Loma is defined by the shrub species that are most common and that dominate the specific vegetation types. If such species are affected by changes in the kind of disturbance to which they must respond, a potential exists for fundamental change in the character and structure of the habitats within which they occur. The reestablishment of a woody plant following a disturbance event depends on the characteristics of seed production and dispersal, seed storage and germination, and seedling establishment (Canham and Marks 1985). In sage scrub and chaparral habitats, crown sprouting also is a significant factor in reestablishment. In addition to these characteristics of the native shrubs, their ability to compete with introduced species (e.g., golden wattle [*Acacia longifolia*], saltbush [*Atriplex lentiformis*], and Canary Island Saint Johnswort [*Hypericum canariense*]), and with herbaceous species (e.g., hottentot fig [*Carpobrotus edulis*], garland daisy [*Chrysanthemum coronarium*]), and the invasive annual grasses, will determine the vegetation that finally dominates a disturbed area.

Soulé and Kohm (1989) indicate that fragmentation can alter the spatial pattern of seed dispersal, thereby enhancing the invasion of some ecosystems by some species and decreasing the dominance of others. A common result of the ground disturbance associated with construction is the reestablishment of weedy species well adapted to the frequent disturbance events. Introduced, disturbance-adapted species are common on Point Loma along roads, at the edges of construction sites, and along the sewer pipeline right-of-way. These populations of weedy species represent the edges of the fragmented habitat units. These populations are constantly producing seeds that disperse into the adjacent native habitat. Following disturbance events, the stored weed seeds are able to germinate and compete with the native shrubs. The factors that determine the outcome of such competitive events are numerous, and the results are expected to vary. In some cases, the native habitat may become reestablished with little change. Under other conditions, the introduced species may completely dominate the new vegetation.

Disturbed habitats delineated along the west edge of Point Loma in 1981 (WCC) continue to be dominated by introduced species. Some native shrubs are growing, but they provide little cover in most of these areas. As a result of their long occupation of these areas, it is likely that a large seed bank of introduced weedy species is present in the soil. Should a subsequent disturbance event occur, the most probable outcome would be losses in cover provided by the native species present and an increase in the cover of the introduced species. The loss of habitat from the edges may follow a similar course. This process, if repeated frequently, may lead to a reduction in the dominance of native species and a change in the character of the habitat.

Where rare, threatened, or endangered plant species are affected by these processes, those unable to compete with the exotics and introduced species will be reduced in numbers. Since there may not be adequate routes for the dispersal of new individuals into the populations, it is likely that the total population of these rarer species will decline. If their numbers drop far enough to place the species at risk of random population fluctuations, they could be extirpated on Point Loma. Some sensitive species, such as the San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*), are well adapted to disturbance events and often occur on previously disturbed sites. Others, such as the San Diego barrel cactus (*Ferocactus viridescens*), do not compete well with introduced species and may be susceptible to eventual extirpation.

In assessing the potential for isolation and fragmentation effects to alter the species composition and diversity of a habitat island like Point Loma, a determination needs to be made of whether the size of the contiguous habitat units on the peninsula are sufficient to support the species present.

If the goal of resource management policy is to maintain the existing vegetation types and constituent species on the Point Loma habitat island, a careful analysis of the effects of habitat fragmentation will be required. In addition, if the rare plant species present on Point Loma continue to decline in the rest of the southern California region, an increasing number of them may become listed as threatened or endangered. If species that are common on Point Loma but rare elsewhere (e.g., snake cholla [*Opuntia parryi* var. *serpentiana*]) are allowed to decline to the point where random events may lead to their extirpation, it is likely that they will be listed as threatened or endangered.

Since little is known about the life histories of many of the sensitive species or their ability to compete following disturbance events, the potential for permanent survival of these species on Point Loma cannot be assessed fully. A reasonable assumption is that, unless disturbance factors are minimized and purposefully manipulated to favor the sensitive species populations and competition with aggressive introduced species is avoided through vegetation management, some, if not many, of the species of concern will eventually disappear from Point Loma.

4.2 DIVERSITY

There are several important components of diversity present in the vegetation of Point Loma. Among these are:

- the species diversity of the associations present on the peninsula;
- the contribution this local species diversity makes to the regional species diversity;
- a genetic component of diversity resulting from adaptation to climatic, soil, and historical factors that may vary over the range of the species;
- structural diversity resulting from variations in the size and the juxtaposition of individuals and groups within the vegetation unit; and
- the mosaic-like distribution of vegetation types in the study area.

Species Diversity

Numerous surveys in Diegan coastal sage scrub habitats and other surveys in maritime succulent scrub and southern maritime chaparral indicate that the species composition of these habitat types on Point Loma compares favorably with that observed at other locations in San Diego County. It is important to note that species diversity may vary spatially with the patchiness of a habitat. Some locations in Diegan coastal sage scrub have low diversity due to the strong dominance of California sagebrush. At other locations a mixed canopy is present with cliff spurge and flat-topped buckwheat becoming dominant. Where canopy openings are frequent, herbaceous species and subshrubs become more common. Another component of the diversity in Diegan coastal sage scrub are the lemonade berry dominated, north-facing slopes. These areas differ both in species composition and structural characteristics. When viewed in a regional context, the Diegan coastal sage scrub vegetation on Point Loma contributes to the overall diversity of sage scrub vegetation in the area due to the strong representation of species more common in Baja California and relatively uncommon north of the border. Since these plants occur near the northern margin of their range and may be at the limit of their adaptation to environmental conditions, they may contain an important component of the genetic diversity in their total gene pool.

As with the sage scrub vegetation, southern maritime chaparral varies in species composition and structure. Patchy distributions of dominant species, including chamise, wart-stemmed ceanothus, and scrub oak, add to the structural and species diversity. Openings in the chaparral also contain a variety of herbs and subshrubs.

The California grassland association on Point Loma has fewer species than other grassland areas observed in the southern California region. This probably results from their small size and isolation from larger units. On Point Loma, the patches of grassland tend to be surrounded by large areas dominated by chaparral and sage scrub vegetation. However, these grasslands represent an important component of the habitat diversity on Point Loma and contribute to the mosaic of vegetation types present.

The most important element of the species diversity present on Point Loma is the number of different species present in the natural habitats. The quality of that diversity can be related to the mix of native and introduced species. In order to fully describe the diversity of plant and wildlife species present on Point Loma, detailed field surveys and sampling studies should be conducted over at least one year (four full seasons). This would increase the probability of identifying herbaceous plants and migratory wildlife.

Development of quantitative evaluation and/or indices of species diversity (such as the Shannon-Wiener diversity indices) also requires seasonal studies and quantitative sampling to obtain density data for all strata of the community. However, these types of indices often mask the reality of the diversity demonstrated by the species numbers and habitat diversity, and are not recommended as an approach for describing species diversity on Point Loma.

Habitat Diversity

The amount of edge habitat associated with a given area may contribute to the value of that habitat for wildlife species and may also be used as an indicator of the habitat diversity of an area. An edge can be defined as the junction of two different landscape elements (Yahner 1988). Edges may be inherent or induced. An inherent edge is a long-term feature of the landscape, such as the ecotone between two plant community types. An induced edge is usually a man-made feature at the junction of distinct land uses, such as between a road and an adjacent plant community (Yahner 1988). Induced edges are of considerable interest to wildlife and land managers (Yahner 1988).

Induced edges can act as a barrier to the distribution and dispersal patterns of wildlife (Yahner 1988). The effectiveness of a barrier to dispersal will vary between species. Those species that are highly mobile and that are little affected by the presence of humans may be able to cross long distances of unsuitable habitat. Species that do not disperse well or that avoid human presence may not be able to cross even relatively narrow barriers. Studies have shown that the breeding success of certain songbirds is reduced near edges due to high incidences of nest predation and parasitism. In addition, increased edge and the resulting habitat fragmentation contribute to the reduced distribution of species requiring interior habitats (e.g., forest birds) or large expanses of contiguous habitat (e.g., mountain lions, bears) (Yahner 1988).

The circle is the polygon shape that has the minimum amount of edge in comparison with its area. If a polygon has an area equal to that of a circle but also has an edge that departs from the circular, that edge will be greater than the circumference of the circle with equal area. The greater the departure from a circle, the larger the edge/area ratio. Patton (1975) published a method for calculating a habitat diversity index using the edge/area ratio for habitat areas that includes internal edges. Patton's habitat diversity index for the mosaic-like pattern of vegetation and habitat types present on Point Loma is calculated as 14.79 or 1,379 percent. This indicates that the area is highly divided and the amount of edge is great compared to that of a circle.

Where inherent edges represent ecotones between native vegetation types, it is likely that over time the habitats have been in the same geographic area and are stable. Some plant and wildlife species may require or be favored by the presence of the edges. These habitats are important because small mammals, reptiles, and birds often use edge habitats/ecotonal areas for foraging. Where induced edges occur with natural vegetation types, the edge habitats are generally not as valuable as natural ecotones/edges. On the Point Loma Navy lands, there is a mixture of natural and created edge habitats such as roads and parking lots. Patton's index does not distinguish between the types of edges of fundamentally different types of habitat when they are all lumped together.

Of a total of approximately 754,042 feet of edge delineated on the Point Loma Navy lands, 186,648 feet are contributed by urban habitat, 145,468 feet by cultivated/landscape habitats, and 81,633 feet by disturbed habitat. This total of 413,749 feet of human-induced edge represents approximately 55 percent of the total edge delineated.

CHAPTER FIVE

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5. REFERENCES

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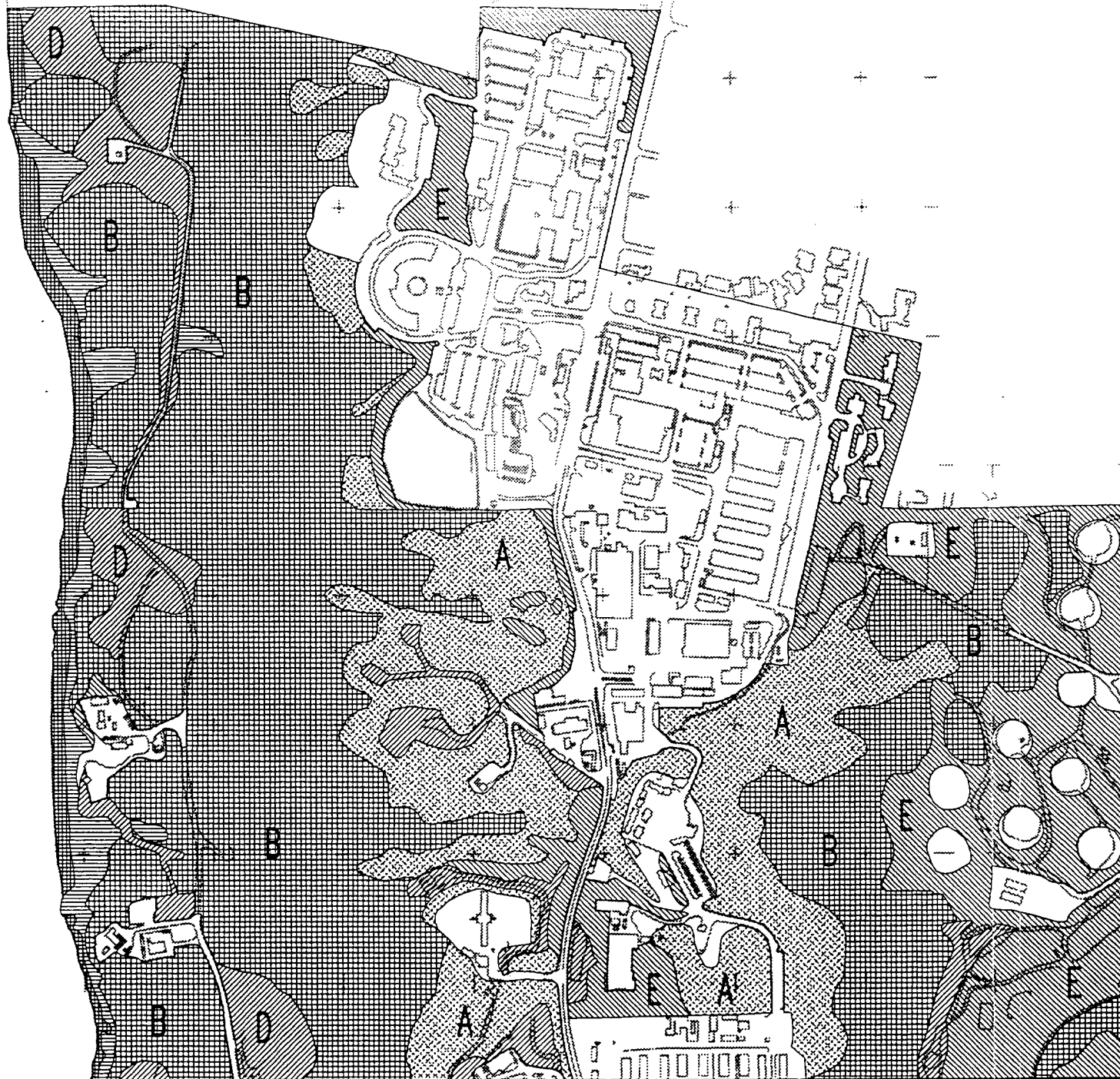
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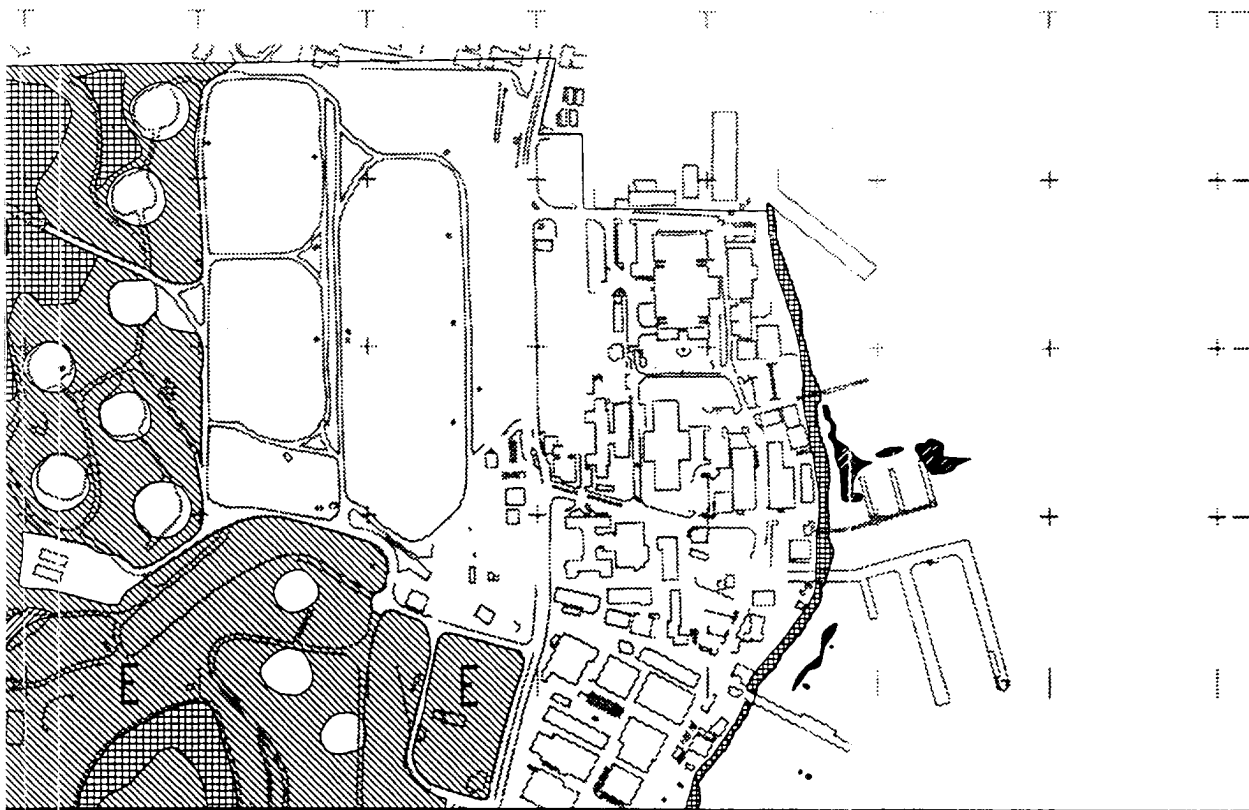
APPENDICES

APPENDIX A

**REDUCED VERSIONS OF D-SIZE MAPS (11 BY 17 INCHES)
SHOWING VEGETATION AND HABITAT, SENSITIVE PLANT
SPECIES, AND SENSITIVE ANIMAL SPECIES**

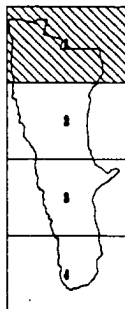


- | | | |
|---|---|---|
| <p>A  Southern Maritime Chaparral</p> <ul style="list-style-type: none"> Chamise Wart-stemmed Ceanothus Mission Manzanita Laurel Sumac Tayon Black Sage <p><i>Adenostoma fasciculatum</i>
<i>Ceanothus verrucosus</i>
<i>Zylococcus bicolor</i>
<i>Malosma laurina</i>
<i>Heteromeles arbutifolia</i>
<i>Salvia mellifera</i></p> | <p>C  Southern Coastal Bluff Scrub</p> <ul style="list-style-type: none"> California Desert-Thorn Seabligh Coastal Salt Grass <p><i>Lycium californicum</i>
<i>Suaeda californica</i>
<i>Distichlis spicata</i></p> <p> Grasland</p> <ul style="list-style-type: none"> Lealy Beet-grass Foothill Needlegrass <p><i>Agrostis diegoensis</i>
<i>Stipa lepida</i></p> <p> Southern Foredune Vegetation</p> <ul style="list-style-type: none"> Beach Evening Primrose Beach Burr Weed Red Sand Verbena <p><i>Composita cheiranthifolia</i>
<i>ssp. suffruticosa</i>
<i>Abronia bipinnatifida</i>
<i>Abronia maritima</i></p> <p> Urban / Not included in Study Area</p> | <p>D  Disturbed</p> <ul style="list-style-type: none"> Common Riggut Foxtail Chees Hottentot Fig Gorland Daisy Australian Saltbush <p><i>Bromus diandrus</i>
<i>Bromus rubens</i>
<i>Carpobrotus edulis</i>
<i>Chrysanthemum coronarium</i>
<i>Atriplex semibaccata</i></p> <p>E  Cultivated / Landscaped</p> <ul style="list-style-type: none"> Murray Red Gum Hottentot Fig Golden Wattle Quail Brush <p><i>Eucalyptus camaldulensis</i>
<i>Carpobrotus edulis</i>
<i>Acacia longifolia</i>
<i>Atriplex lentiformis</i></p> <p>F  Intertidal Zone</p> <p> Eelgrass Beds</p> <p>Mapped from MCCOSC 1992.</p> |
|---|---|---|
- * Denotes a sensitive species widely distributed within this vegetation / habitat class. Species is considered present unless shown absent by site specific survey.

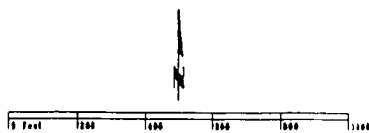


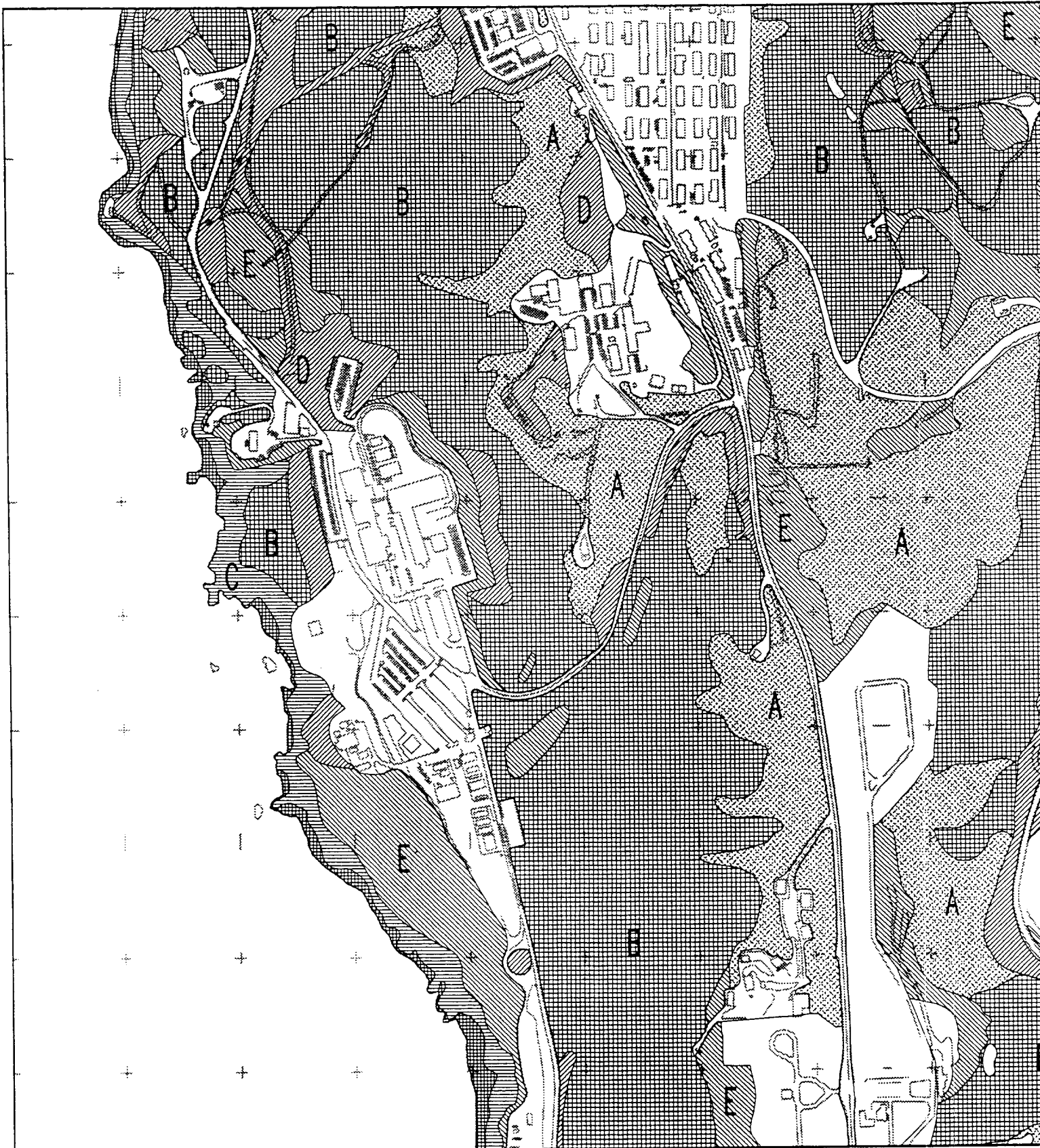
diandrus
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
us comaldulensis
otus edulis
angulalis
lentiformis



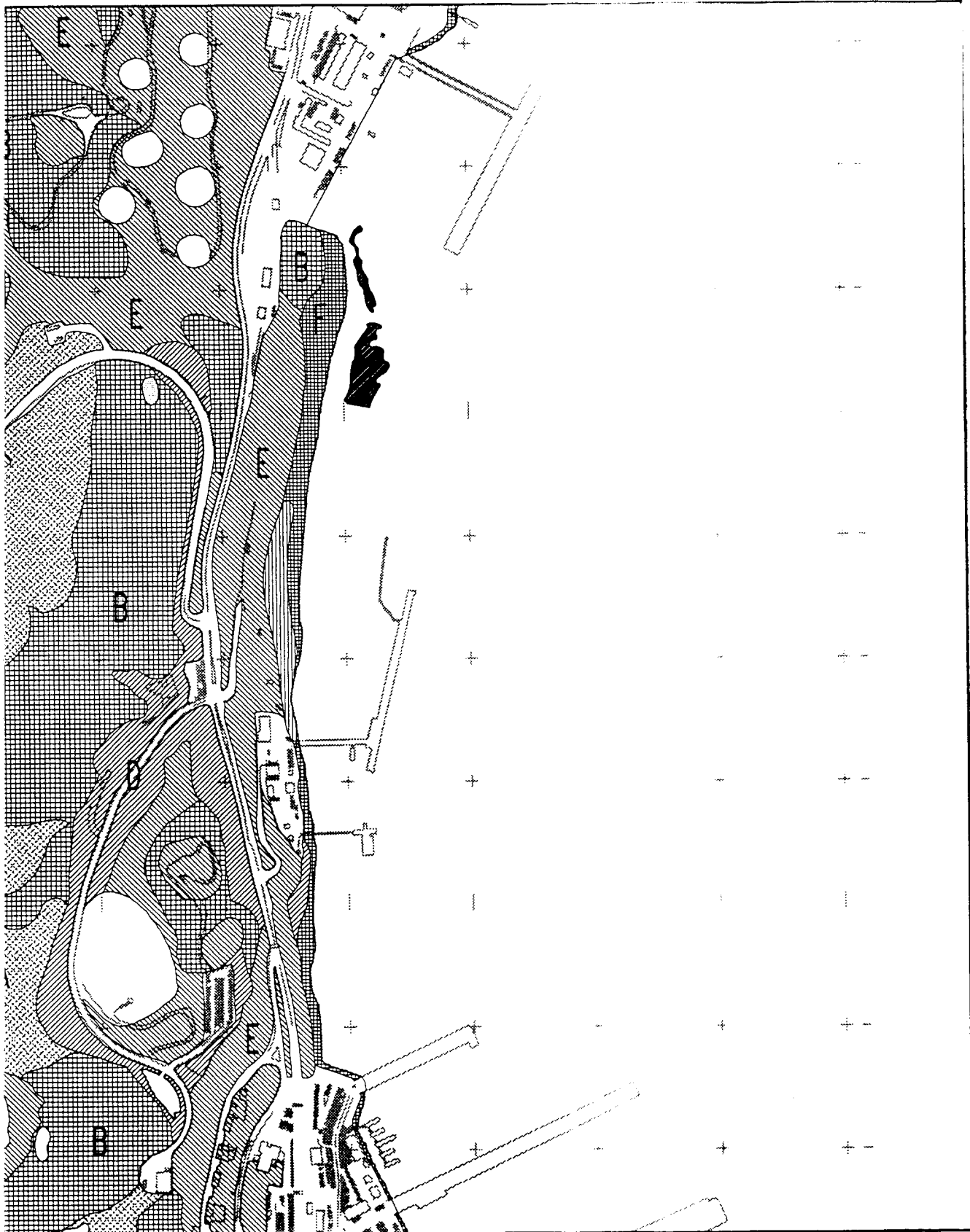
Vegetation and Habitat Types Present on Point Loma Navy Properties, San Diego CA, 1992





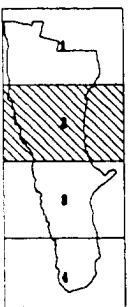
<p>A  Southern Maritime Chaparral</p> <ul style="list-style-type: none"> Chamise Wart-stemmed Ceanothus Mission Manzanita Laurel Sumac Toyon Black Sage 	<ul style="list-style-type: none"> <i>Adenostoma fuscicolum</i> <i>Ceanothus verrucosus</i> <i>Zylococcus bicolor</i> <i>Molone laurina</i> <i>Heteromeles arbutifolia</i> <i>Salvia mellifera</i> 	<p>C  Southern Coastal Bluff Scrub</p> <ul style="list-style-type: none"> California Desert-Thorn Seabligh Coastal Salt Grass 	<ul style="list-style-type: none"> <i>Lycium californicum</i> <i>Suaeda californica</i> <i>Distichlis spicata</i> 	<p>D  Disturbed</p> <ul style="list-style-type: none"> Common Riggul Foxtail Chess Hottentot Fig Golden Daisy Australian Saltbush 	<ul style="list-style-type: none"> <i>Bromus diandrus</i> <i>Bromus rubens</i> <i>Carpobrotus edulis</i> <i>Chrysanthemum coronarium</i> <i>Atriplex semibaccata</i>
<p>B  Maritime Sage Scrub</p> <ul style="list-style-type: none"> California Sagebrush Flat-top Buckwheat Laurel Sumac Lemonadeberry Cliff Spurge 	<ul style="list-style-type: none"> <i>Artemisia californica</i> <i>Eriogonum fasciculatum</i> <i>Molone laurina</i> <i>Rhus integrifolia</i> <i>Euphorbia misera</i> 	<p> Grassland</p> <ul style="list-style-type: none"> Leafy Bent-grass Foothill Needlegrass 	<ul style="list-style-type: none"> <i>Agrostis diegensis</i> <i>Stipa repida</i> 	<p>E  Cultivated / Landscaped</p> <ul style="list-style-type: none"> Murray Red Gum Hottentot Fig Golden Wattle Quail Brush 	<ul style="list-style-type: none"> <i>Eucalyptus camaldulensis</i> <i>Carpobrotus edulis</i> <i>Acacia longifolia</i> <i>Atriplex lentiformis</i>
<p>F  Interstitial Zone</p> <ul style="list-style-type: none"> Eelgrass Beds 		<p> Urban / Not Included in Study Area</p>		<p>Mapped from NCCOSC 1992.</p>	

* Denotes a sensitive species widely distributed within this vegetation / habitat class. Species is considered present unless shown absent by site specific survey.

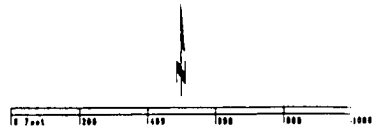


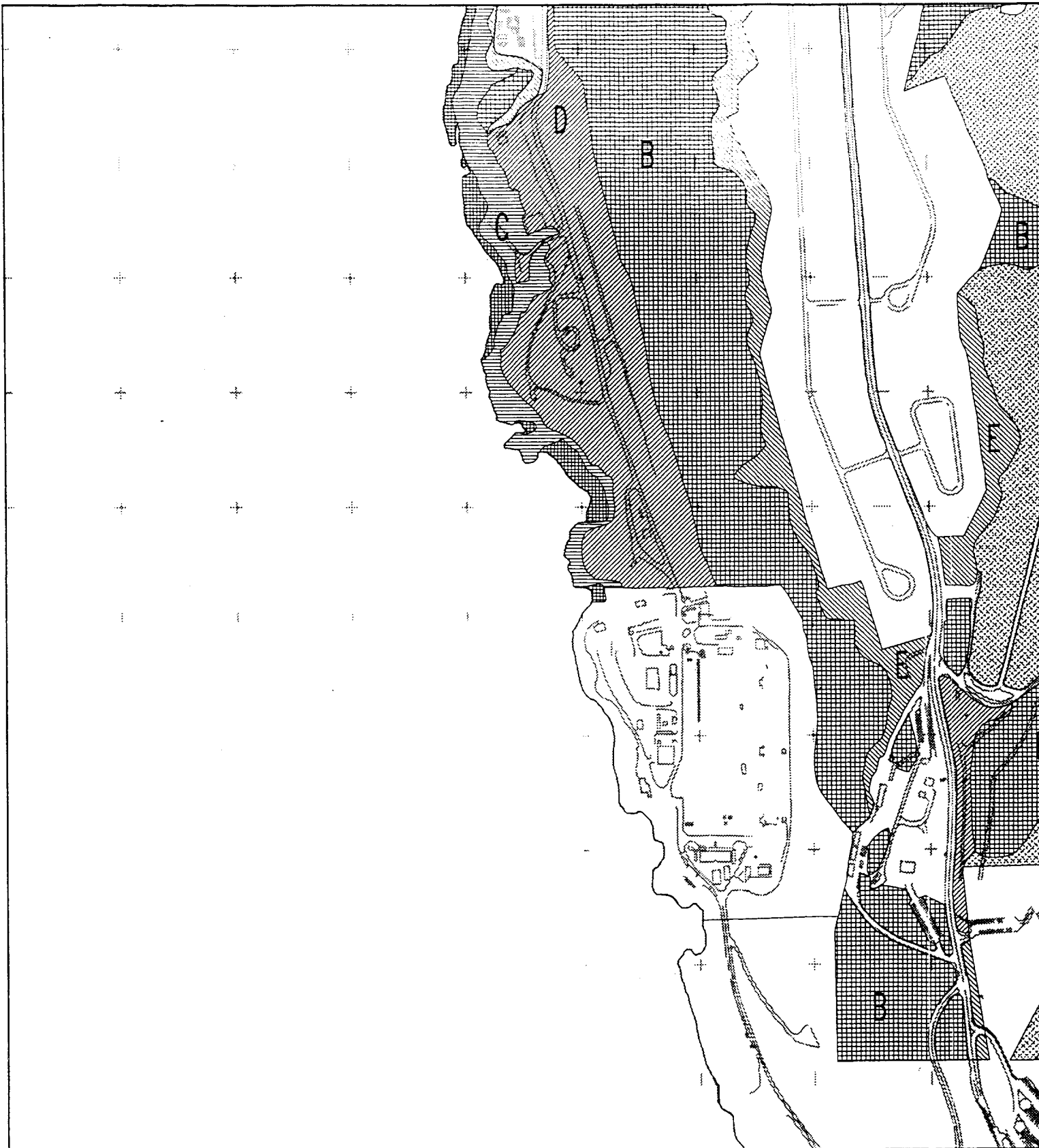
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



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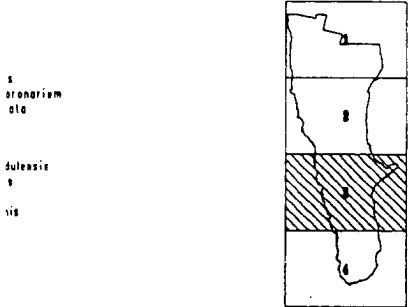
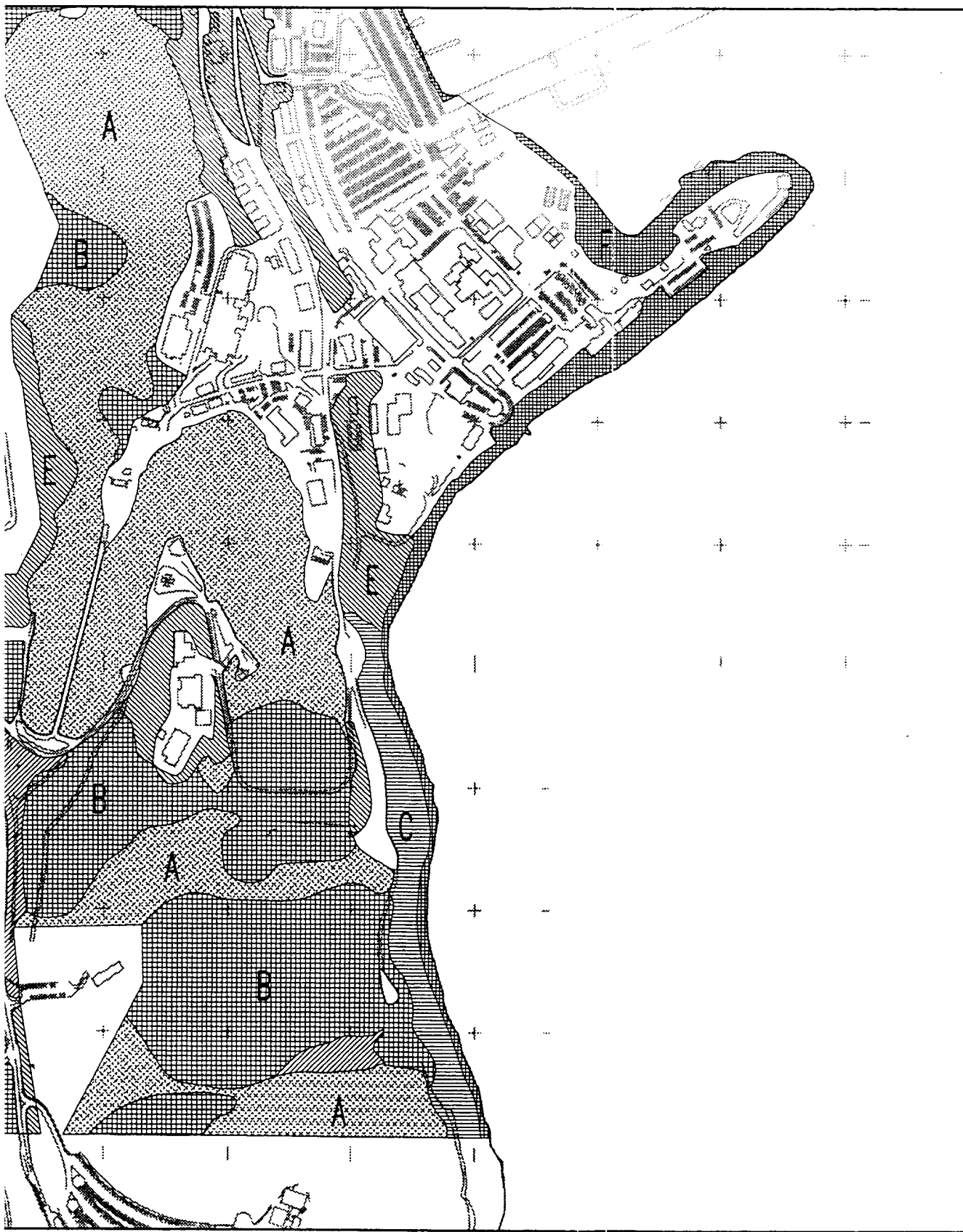


Vegetation and Habitat Types Present on Point Loma Navy Properties, San Diego CA, 1992

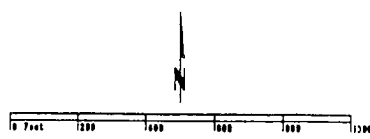














A	 Southern Maritime Chaparral Chamise • West-stemmed Ceanothus Mission Manzanita Laurel Sumac Toyon Black Sage Adenostoma fasciculatum Ceanothus verrucosus Xylococcus bicolor Malosma laurina Heteromeles arbutifolia Salvia mellifera	C	 Southern Coastal Bluff Scrub California Desert-Thorn Seabligh Coastal Salt Grass Lyrium californicum Scaevola californica Distichlis spicata  Grassland Leely Bent-grass Foothill Needlegrass Agrostis diegoensis Stipa lepidota  Southern Fore-dune Vegetation Beach Evening Primrose Beach Burr Weed Red Sand Verbena Comissonia cheiranthifolia ssp. suffruticosa Ambrosia bipinnatifida Abronia maritima	D	 Disturbed Common Riggut Fastol Chess Hottentot Fig Gortland Daisy Australian Saltbush Bromus diandrus Bromus rubens Carpobrotus edulis Chrysanthemum coronarium Atriplex semibaccata
B	 Maritime Sage Scrub California Sagebrush Flat-top Buckwheat Laurel Sumac Lemonadeberry • Cliff Spurge Artemisia californica Eriogonum fasciculatum Malosma laurina Rhus integrifolia Euphorbia misera	E	 Cultivated / Landscaped Murray Red Gum Hottentot Fig Golden Wattle Quail Brush Eucalyptus camaldulensis Carpobrotus edulis Acacia longifolia Atriplex laetifolia	F	 Intertidal Zone  Eelgrass Beds Mapped from MCCOSC 1992.
<p>• Denotes a sensitive species widely distributed within this vegetation / habitat class. Species is considered present unless shown absent by site specific survey.</p>		Urban / Not Included in Study Area	 Urban / Not Included in Study Area		



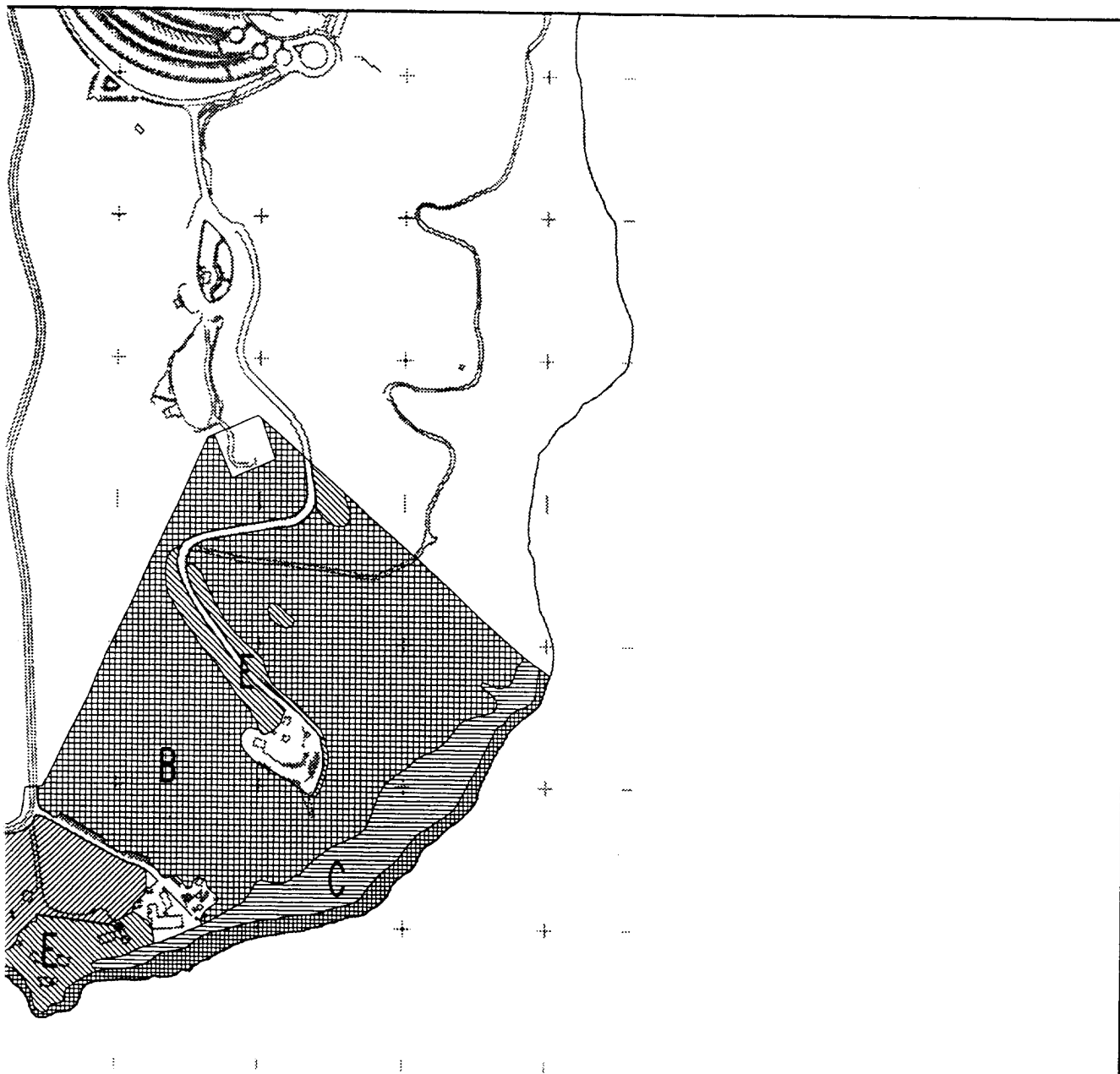
Vegetation and Habitat Types Present on Point Loma Navy Properties, San Diego CA, 1992



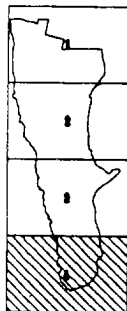


<p>A  Southern Maritime Chaparral</p> <ul style="list-style-type: none"> • Chimise • Wart-stemmed Ceonothus • Mission Manzanita • Laurel Sumac • Toyon • Black Sage <p>B  Maritime Sage Scrub</p> <ul style="list-style-type: none"> • California Sagebrush • Flat-top Buckwheat • Laurel Sumac • Lemonadeberry • Cliff Spurge 	<p>C  Southern Coastal Bluff Scrub</p> <ul style="list-style-type: none"> • California Desert-Thorn • Seabligh • Coastal Salt Grass <p> Grassland</p> <ul style="list-style-type: none"> • Leafy Bent-grass • Foothill Needlegrass <p> Southern Fore-dune Vegetation</p> <ul style="list-style-type: none"> • Beach Evening Primrose • Beach Burr Weed • Red Sand Verbena <p> Urban / Not included in Study Area</p>	<p>D  Disturbed</p> <ul style="list-style-type: none"> • Common Riggul • Fastigi Chess • Hottentot Fig • Gerland Daisy • Australian Saltbush <p>E  Cultivated / Landscaped</p> <ul style="list-style-type: none"> • Murray Red Gum • Hottentot Fig • Golden Wattle • Quail Brush <p>F  Intertidal Zone</p> <p> Eelgrass Beds</p>	<ul style="list-style-type: none"> • <i>Adenostoma fasciculatum</i> • <i>Ceanothus verrucosus</i> • <i>Xylococcus bicolor</i> • <i>Malaema laurina</i> • <i>Heteromeles arbutifolia</i> • <i>Sotria mellifera</i> <ul style="list-style-type: none"> • <i>Lycium californicum</i> • <i>Suaeda californica</i> • <i>Distichlis spicata</i> <ul style="list-style-type: none"> • <i>Agrostis diegoensis</i> • <i>Stipa lapida</i> <ul style="list-style-type: none"> • <i>Comissonia cheiranthifolia</i> ssp. <i>suffruticosa</i> • <i>Ambrosia bipinnatifida</i> • <i>Abronia maritima</i> <ul style="list-style-type: none"> • <i>Bromus diandrus</i> • <i>Bromus rubens</i> • <i>Carpobrotus edulis</i> • <i>Chrysanthemum coronarium</i> • <i>Atriplex semibaccata</i> <ul style="list-style-type: none"> • <i>Eucalyptus camaldulensis</i> • <i>Carpobrotus edulis</i> • <i>Acacia longifolia</i> • <i>Atriplex lentiformis</i>
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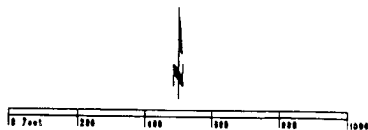
* Denotes a sensitive species widely distributed within this vegetation / habitat class. Species is considered present unless shown absent by site specific survey.

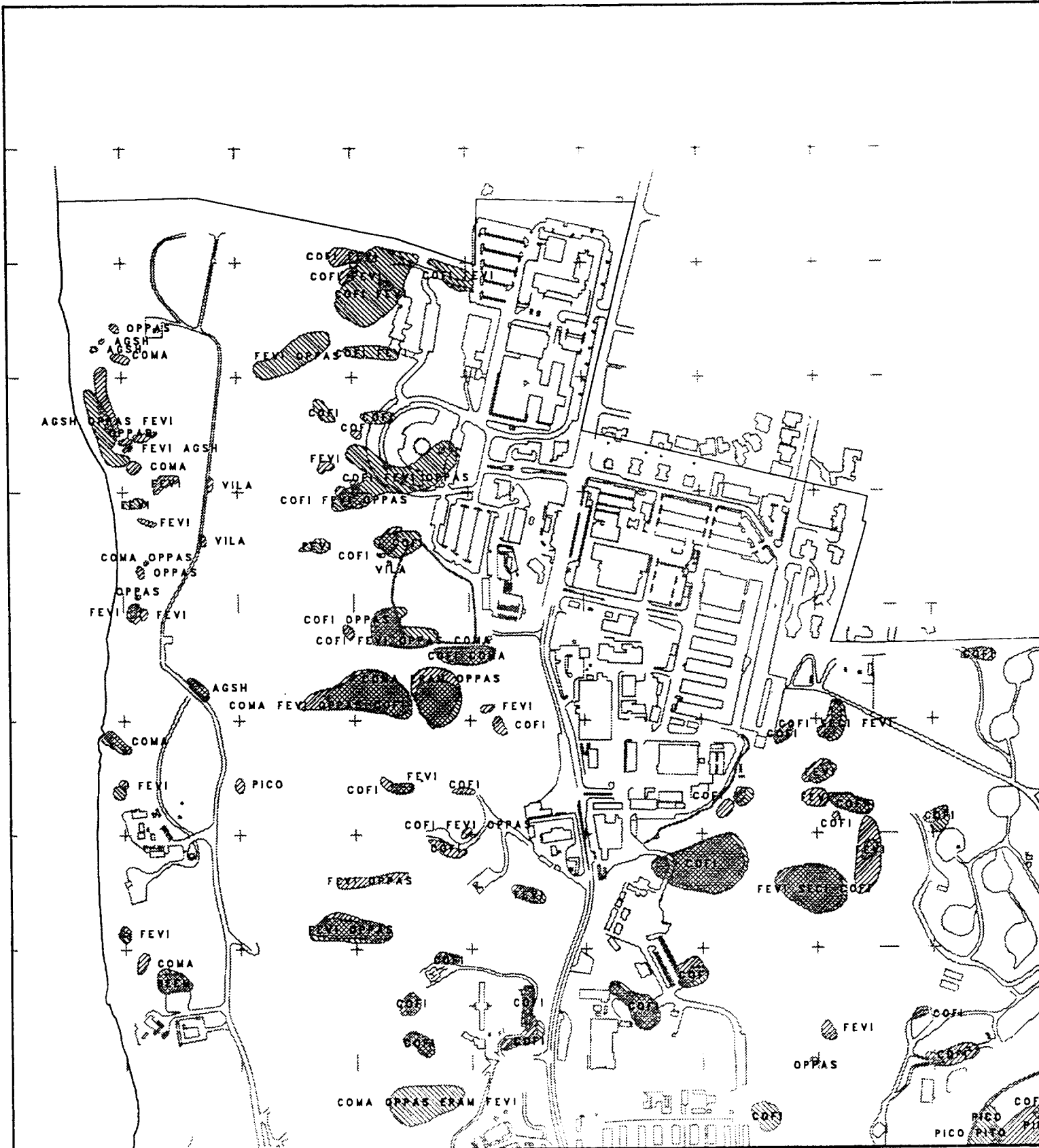


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Vegetation and Habitat Types Present on
Point Loma Navy Properties, San Diego CA, 1992





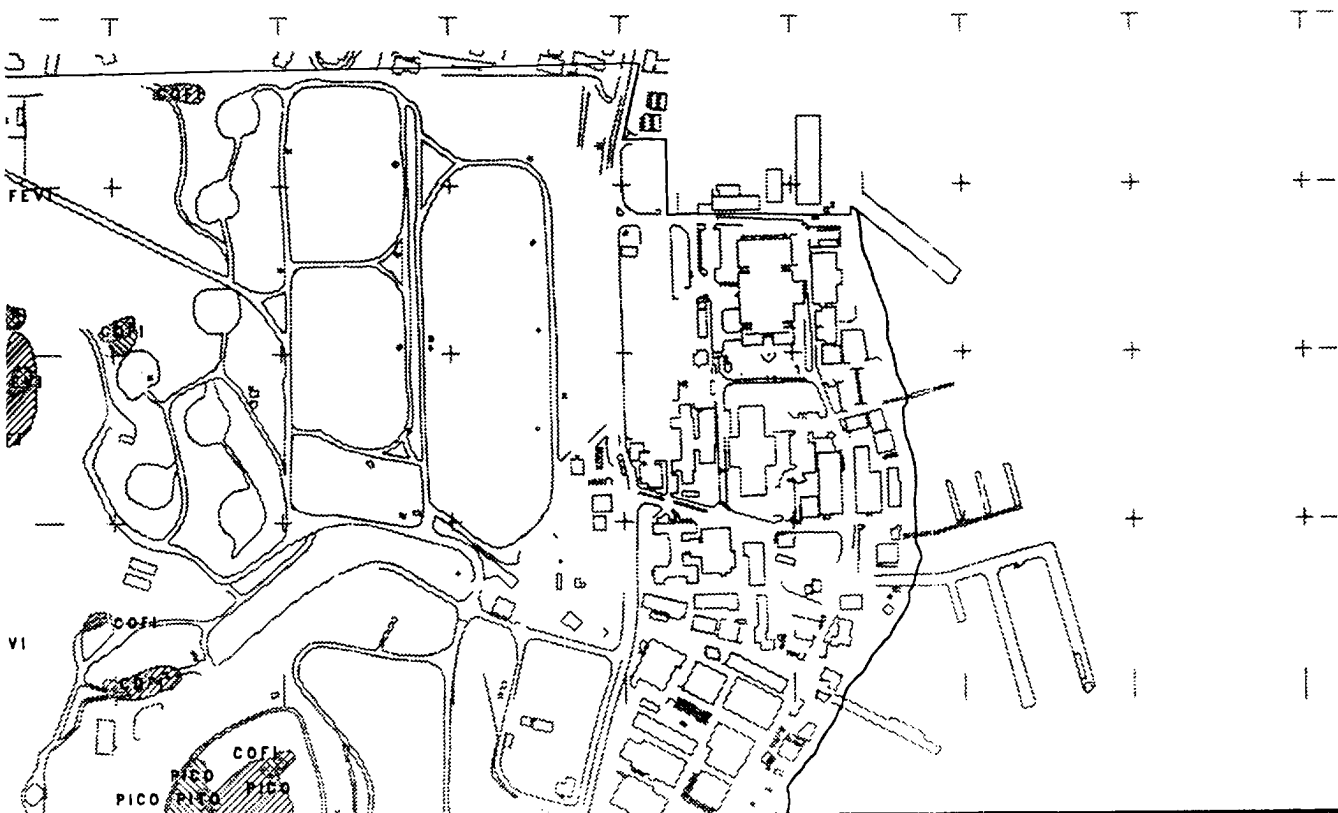
- Sensitive Plant Species Mapped in 1981
- Sensitive Plant Species Mapped in 1992
- Sensitive Plant Species Mapped in 1981 and 1992

* The distribution of EUMI is closely associated with the distribution of Maritime Sage Scrub and the distribution of CEVE is closely associated with the distribution of Southern Maritime Chaparral. EUMI and CEVE should be considered present in those vegetation types unless shown to be absent by site specific surveys.

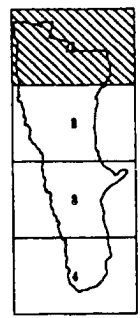
- AGSH
- BEEM
- CAMA
- CEVE
- COFI
- COMA
- DIOC
- ERAM
- EUMI
- FEVI
- FRBI
- OPPAS
- PICO
- PITO
- SECI
- VILA

- Agave shawii*
- Berberocactus emeryi*
- Calandrinia maritima*
- Ceanothus verrucosus*
- Corethrogyne filaginifolia*
var. *incana*
- Crocosmia maritima*
- Dichondra occidentalis*
- Erysimum amophilum*
- Euphorbia misera*
- Ferocactus viridescens*
- Fritillaria biflora*
- Opuntia parryi* var. *serpentina*
- Piperia cooperi*
- Pinus torreyana*
- Selaginella cinerascens*
- Viguiera laciniata*

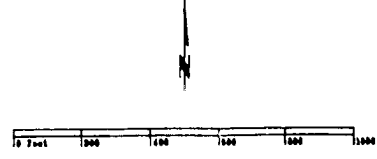
- Shaw's agave
- Golden-spined cactus
- Sea klasses
- Wart-stemmed ceanothus
- San Diego sand aster
- San Diego sea dahlia
- Western ponyfoot
- Coast wallflower
- Cliff spurge
- San Diego barrel cactus
- Chocolate lily
- Snake cholla
- Cooper's rein orchid
- Torrey pine
- Ashy spike-moss
- San Diego sunflower

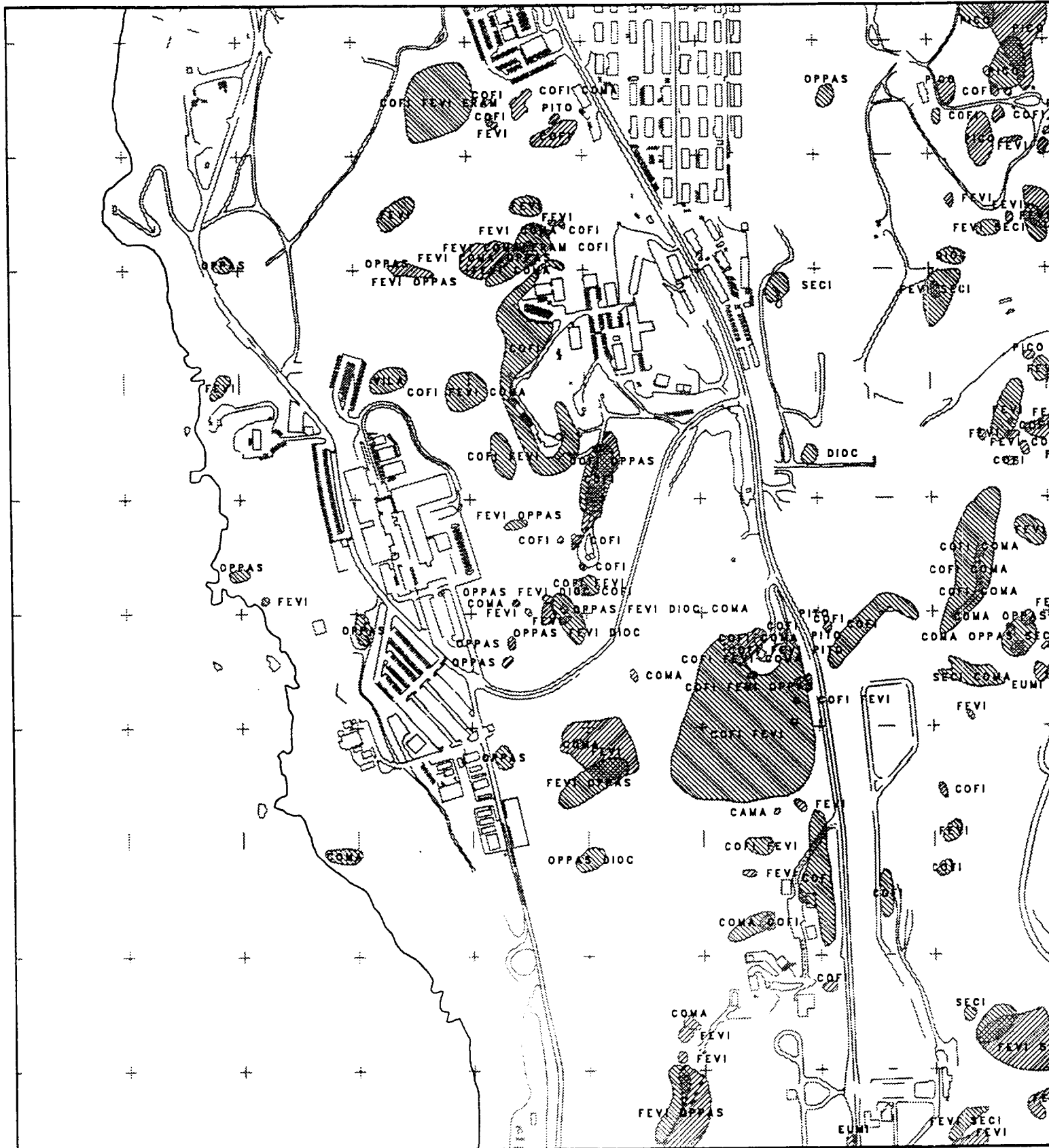


- Diego agave
- spined cactus
- grass
- stemmed caenothus
- Diego sand aster
- Diego sea dahlia
- fern ponyfoot
- wallflower
- spurge
- Diego barrel cactus
- white lily
- cholla
- yer's rein orchid
- y pine
- spike-moss
- Diego sunflower



Sensitive Plant Species on Point Loma Navy Properties, San Diego CA, 1992





▨ Sensitive Plant Species Mapped in 1981

▩ Sensitive Plant Species Mapped in 1982

▧ Sensitive Plant Species Mapped in 1981 and 1982

* The distribution of EDM1 is closely associated with the distribution of Maritime Sage Scrub and the distribution of CEVE is closely associated with the distribution of Southern Maritime Chaparral. EUMI and CEVE should be considered present in those vegetation types unless shown to be absent by site specific surveys.

AGSH
BEEM
CAMA
• CEVE
COFI

COMA
DIOC
ERAM
• EUMI
FEVI
FRBI
OPPAS
PICO
PITO
SECI
VILA

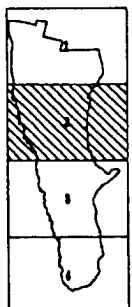
Agave shawii
Bergerocactus emoryi
Calandrinia maritima
Ceanothus verrucosus
Corethrogyne filaginifolia
var. *incana*
Cercopitris maritima
Dichondra occidentalis
Erysimum ammodithium
Euphorbia misera
Ferocactus viridescens
Fritillaria biflora
Opuntia parryi var. *serpentina*
Piperia cooperi
Pinus torreyana
Selaginella cinerascens
Viguiera laciniata

Shaw's agave
Golden-spined cereus
Sea klasses
Wart-stemmed ceanothus
San Diego sand aster

San Diego sea dahlia
Western ponyfoot
Coast wallflower
Cliff spurge
San Diego barrel cactus
Chocolate lily
Snake cholla
Cooper's rein orchid
Torrey pine
Ashy spike-moss
San Diego sunflower

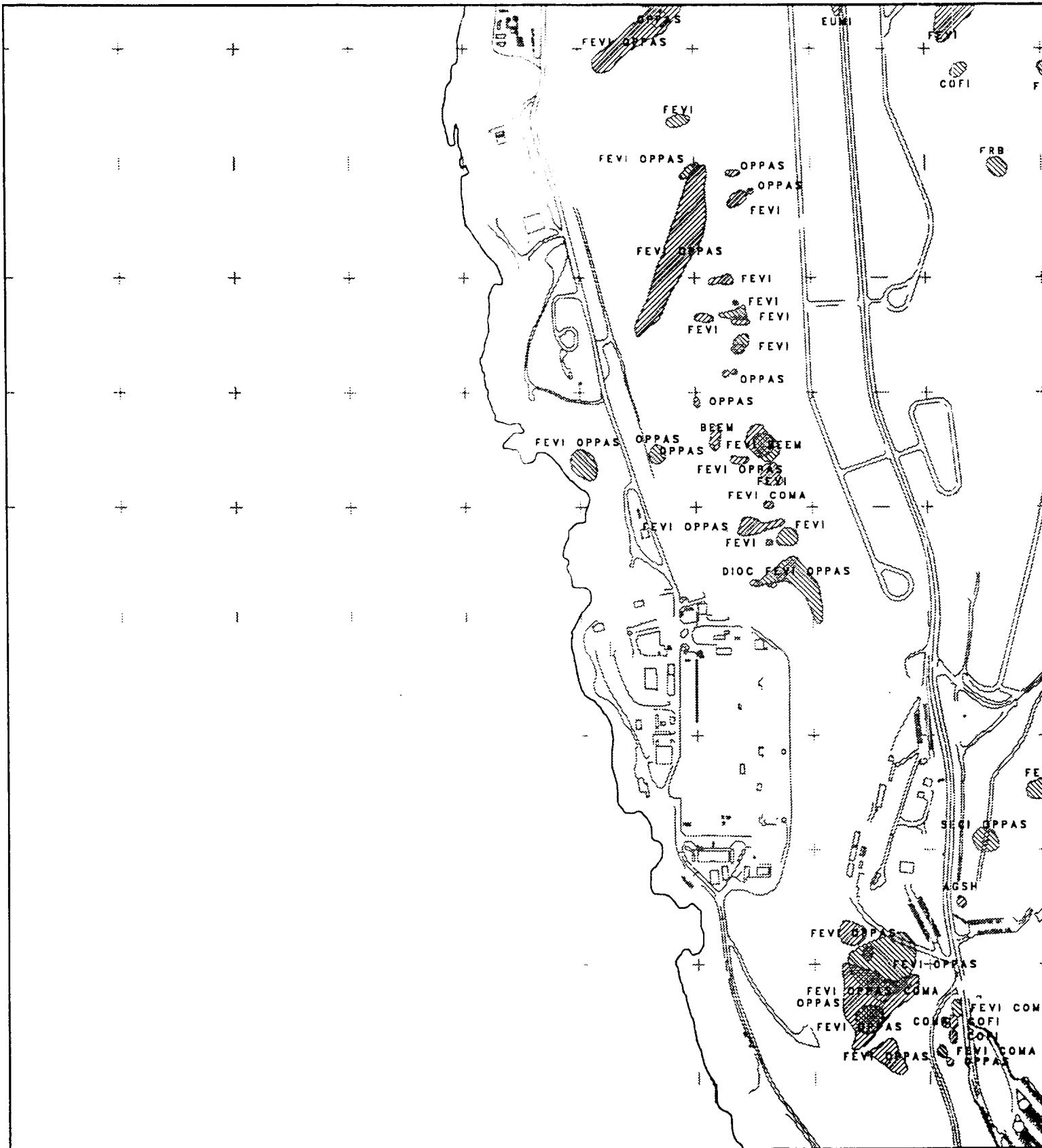


- gove
- lined cereus
- ss
- mmad ceanothus
- o sand aster
- o sea dahlia
- ponyfoot
- lilflower
- rgo
- o barrel cactus
- lilly
- olla
- rain orchid
- lne
- ke-moss
- o sunflower



Sensitive Plant Species on Point Loma Navy Properties, San Diego CA, 1992





Sensitive Plant Species Mapped in 1981

Sensitive Plant Species Mapped in 1982

Sensitive Plant Species Mapped in 1981 and 1982

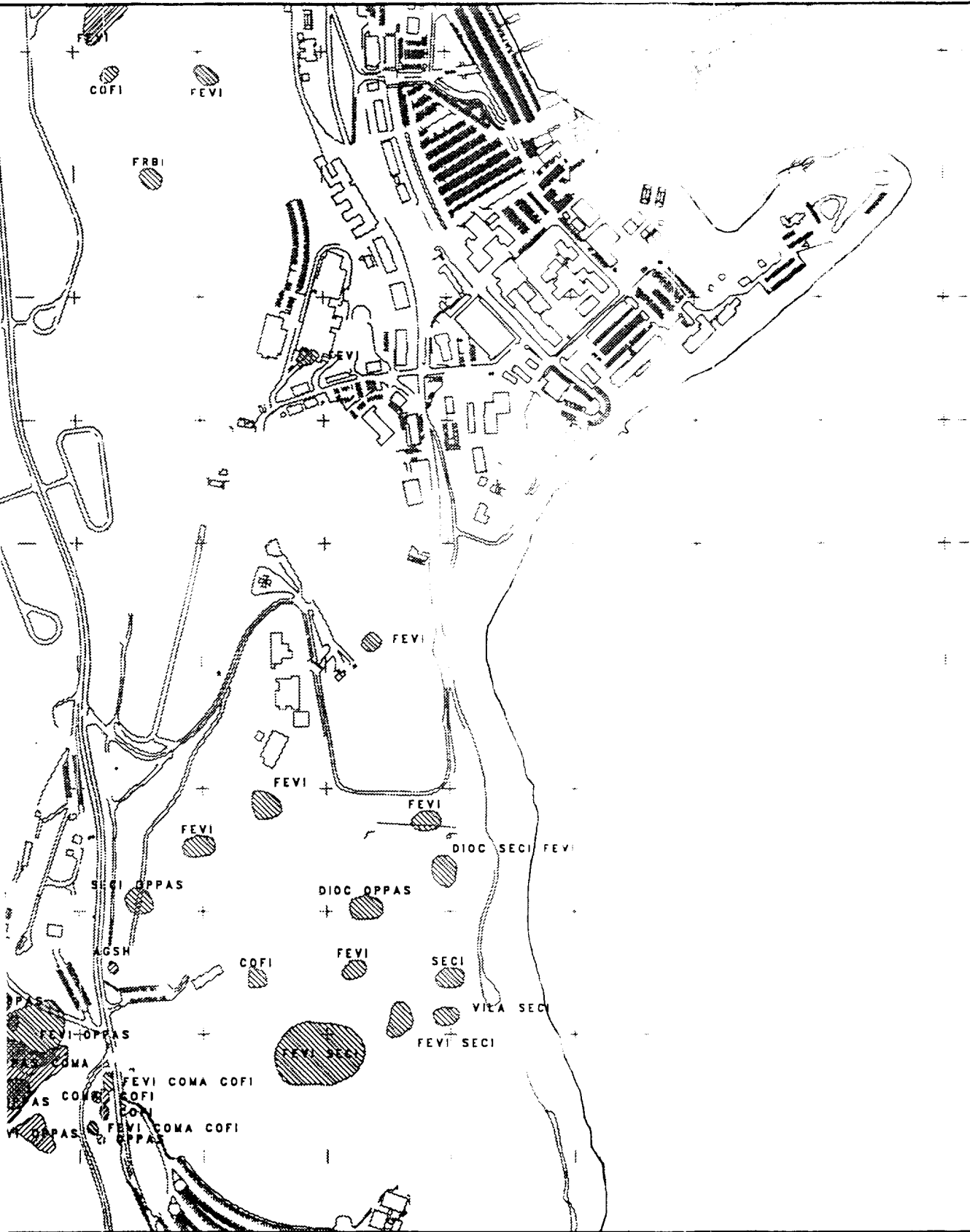
* The distribution of EUMI is closely associated with the distribution of Maritime Sage Scrub and the distribution of CEVE is closely associated with the distribution of Southern Maritime Chaparral. EUMI and CEVE should be considered present in these vegetation types unless shown to be absent by site specific surveys.

AGSH
BEEM
CAMA
CEVE
COFI
COMA
DIOC
ERAM
EUMI
FEVI
FRBI
OPPAS
PICO
PITO
SECI
VILA

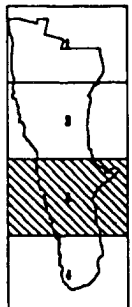
Agave shawii
Bergerecactus emoryi
Calandrinia maritima
Ceanothus verrucosus
Cerithrogyne filaginifolia
var. *incana*
Cercopsis maritima
Dichondra occidentalis
Erysimum amplexatum
Euphorbia misera
Ferocactus viridescens
Fritillaria biflora
Opuntia parryi var. *serpentina*
Piperia cooperi
Pinus torreyana
Selaginella cinerascens
Vigilera laciniata

Show's agave
Golden-spined cactus
Sea kisses
Wart-stemmed ceanothus
San Diego sand aster

San Diego sea dahlia
Western ponyfoot
Coast wallflower
Cliff spurge
San Diego barrel cactus
Chocolate lily
Snake cholla
Cooper's rein orchid
Torrey pine
Ashy spike-moss
San Diego sunflower

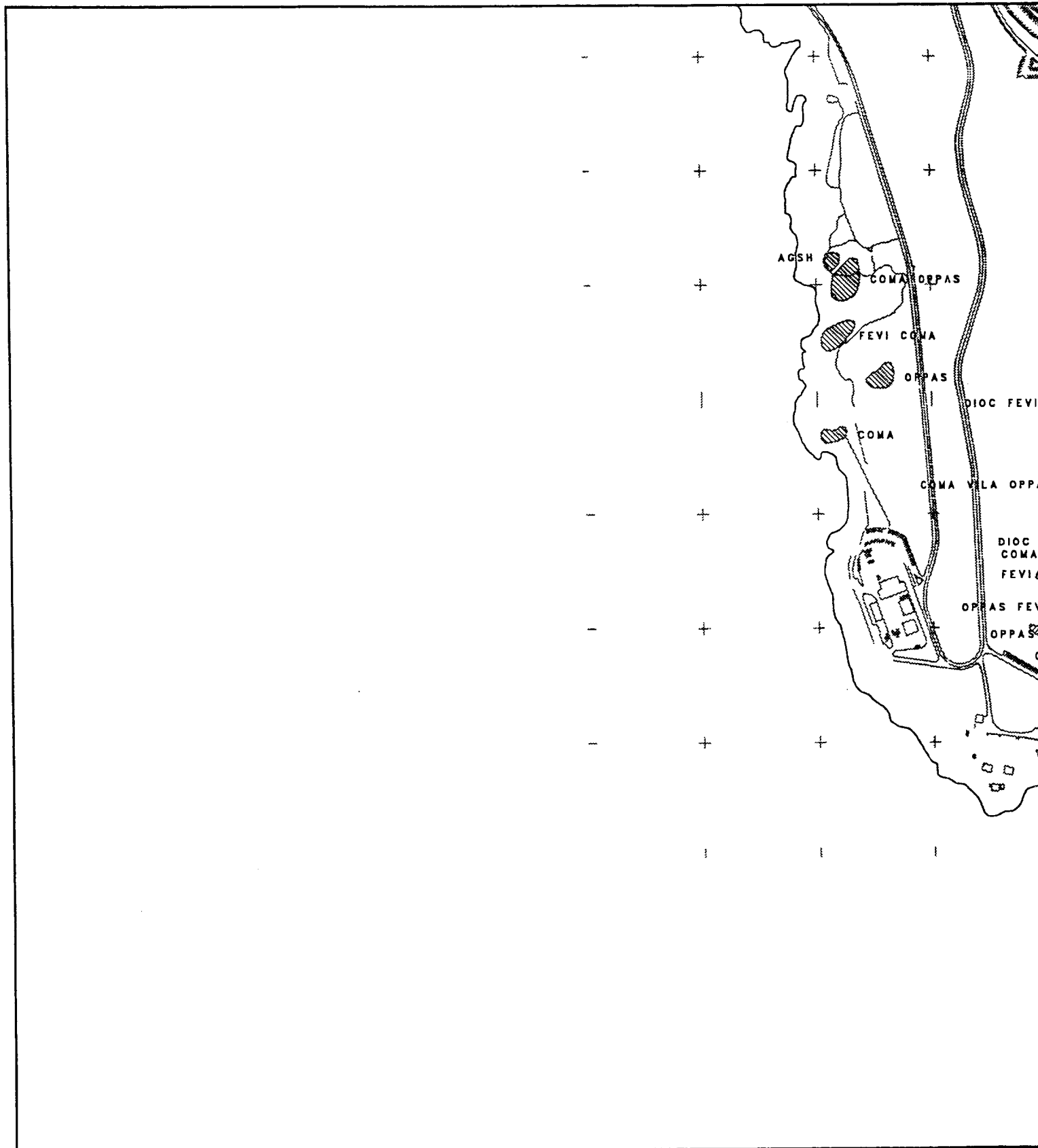





- 1/8 agave
- 1/8 n-spined cactus
- 1/8 clematis
- 1/8 stemmed ceanothus
- 1/8 Diego sand aster
- 1/8 Diego sea dahlia
- 1/8 iron ponyfoot
- 1/8 wallflower
- 1/8 spurge
- 1/8 Diego barrel cactus
- 1/8 late lily
- 1/8 cholla
- 1/8 ir's rain orchid
- 1/8 y pine
- 1/8 spike-moss
- 1/8 Diego sunflower



Sensitive Plant Species on Point Loma Navy Properties, San Diego CA, 1992





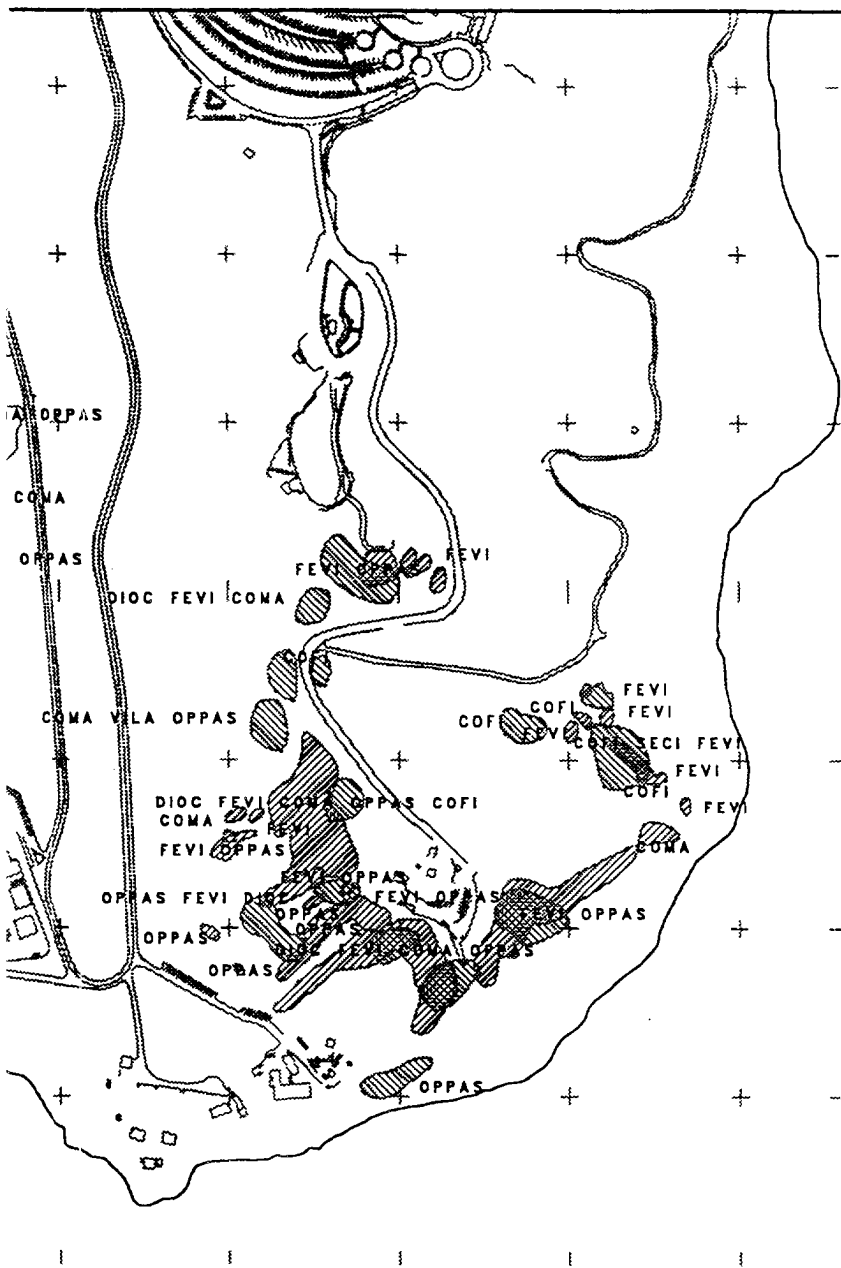
-  Sensitive Plant Species Mapped in 1981
-  Sensitive Plant Species Mapped in 1982
-  Sensitive Plant Species Mapped in 1981 and 1982

* The distribution of EDMI is closely associated with the distribution of Maritime Sage Scrub and the distribution of CEVE is closely associated with the distribution of Southern Maritime Chaparral. EDMI and CEVE should be considered present in those vegetation types unless shown to be absent by site specific surveys.

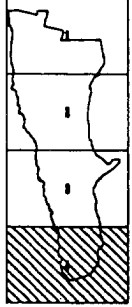
- AGSH
- BEEM
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- CEVE
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- ERAM
- EUMI
- FEVI
- FRBI
- OPPAS
- PICO
- PITO
- SECI
- VILA

- Agave shawii*
- Bergerocactus emoryi*
- Calandrinia maritima*
- Ceanothus verrucosus*
- Corethrogyne filaginifolia*
var. *incana*
- Coreopsis maritima*
- Dichondra occidentalis*
- Erysimum ammophilum*
- Euphorbia misera*
- Ferocactus viridescens*
- Fritillaria biflora*
- Opuntia parryi* var. *serpentina*
- Piperia cooperi*
- Pinus torreyana*
- Selaginella cinerascens*
- Viguiera laciniata*

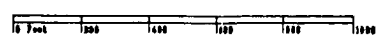
- Show's agave
- Golden-spined cereus
- Sea kisses
- Wart-stemmed ceanothus
- San Diego sand aster
- San Diego sea dahlia
- Western ponyfoot
- Coast wallflower
- Cliff spurge
- San Diego barrel cactus
- Chocolate lily
- Snake cholla
- Cooper's rein orchid
- Torrey pine
- Ashy spike-moss
- San Diego sunflower



- o gavel
- o pined cereus
- es
- mmmed ceanothus
- o sand aster
- o sea dahlia
- ponyfoot
- illflower
- rge
- o barrel cactus
- s lilly
- olla
- rain orchid
- lne
- ke-moss
- o sunflower



Sensitive Plant Species on Point Loma Navy Properties, San Diego CA, 1992





- ▨ Sensitive Wildlife Species Mapped in 1981
- ▨ Sensitive Wildlife Species Mapped in 1992
- ▨ Sensitive Wildlife Species Mapped in 1981 and 1992
- ▲ Species Mapped in 1981
- Species Mapped in 1992

Reptiles

Orange-throated whiptail

Cnemidophorus hyperythrus

Birds

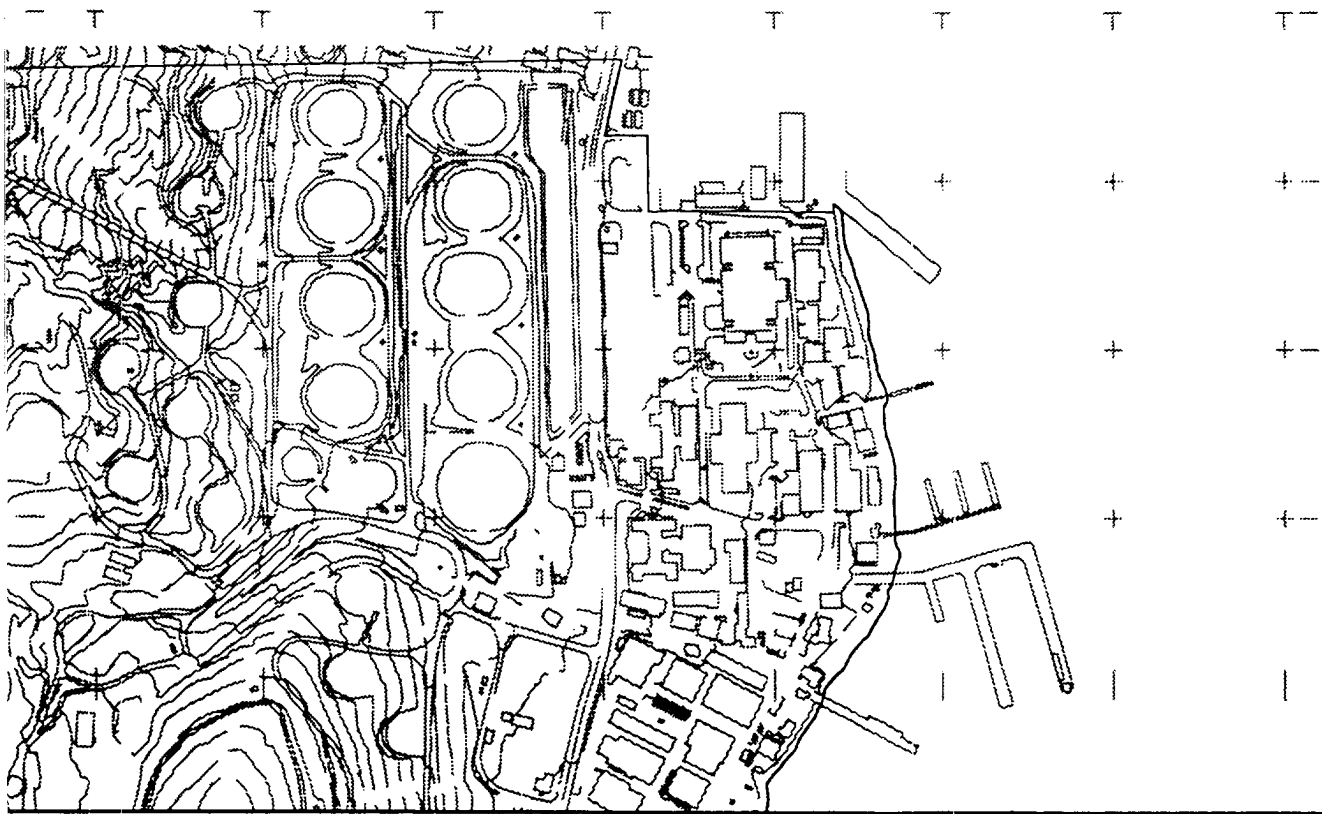
Brown pelican
 Western gull
 Heerman's gull
 Brandt's cormorant
 Double-crested cormorant
 Black-crowned night-heron
 Great egret
 Western grebe
 Surf scoter
 Loggerhead shrike

Pelecanus occidentalis
Larus occidentalis
Larus heermanni
Phalacrocorax penicillatus
Phalacrocorax auritus
Ardea herodias
Casmerodius albus
Aschmophorus occidentalis
Melanitta perspicillata
Lanius ludovicianus

Mammals

California sea lion

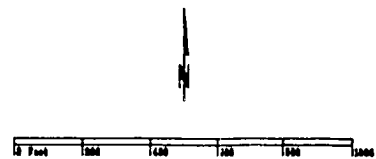
Zalophus californicus

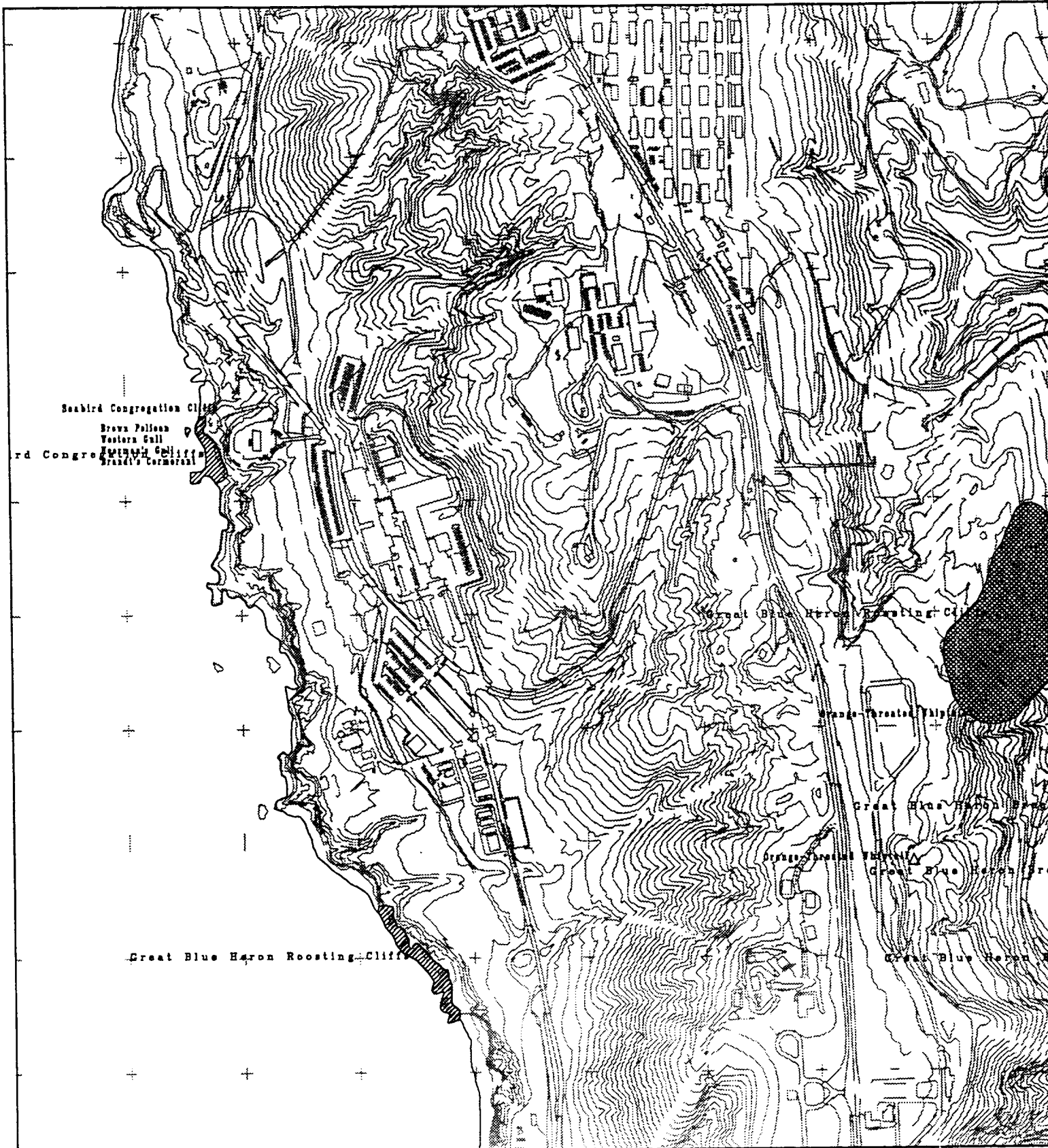


midoplerus hyperythrus
ianus occidentalis californicus
us occidentalis
us heermanni
lacrocorax pentillatus
lacrocorax curtius
sa hesperia
merodius albus
amopherus occidentalis
antia perspicillata
ius ludovicianus
ophus californicus



Sensitive Wildlife Species on Point Loma
Navy Properties, San Diego CA, 1992





Seabird Congregation Cliffs
 Brown Pelican
 Western Gull
 Heermann Gull
 Brandt's Cormorant

Wormat Bank Heron Roosting Cliffs




Orange-throated Whiptail

Great Blue Heron

Orange-throated Whiptail
 Great Blue Heron

Great Blue Heron Roosting Cliffs

Great Blue Heron

-  Sensitive Wildlife Species Mapped in 1981
-  Sensitive Wildlife Species Mapped in 1992
-  Sensitive Wildlife Species Mapped in 1981 and 1992
- ▲ Species Mapped in 1981
- Species Mapped in 1992

Reptiles

Orange-throated whiptail

Cnemidophorus hyperythrus

Birds

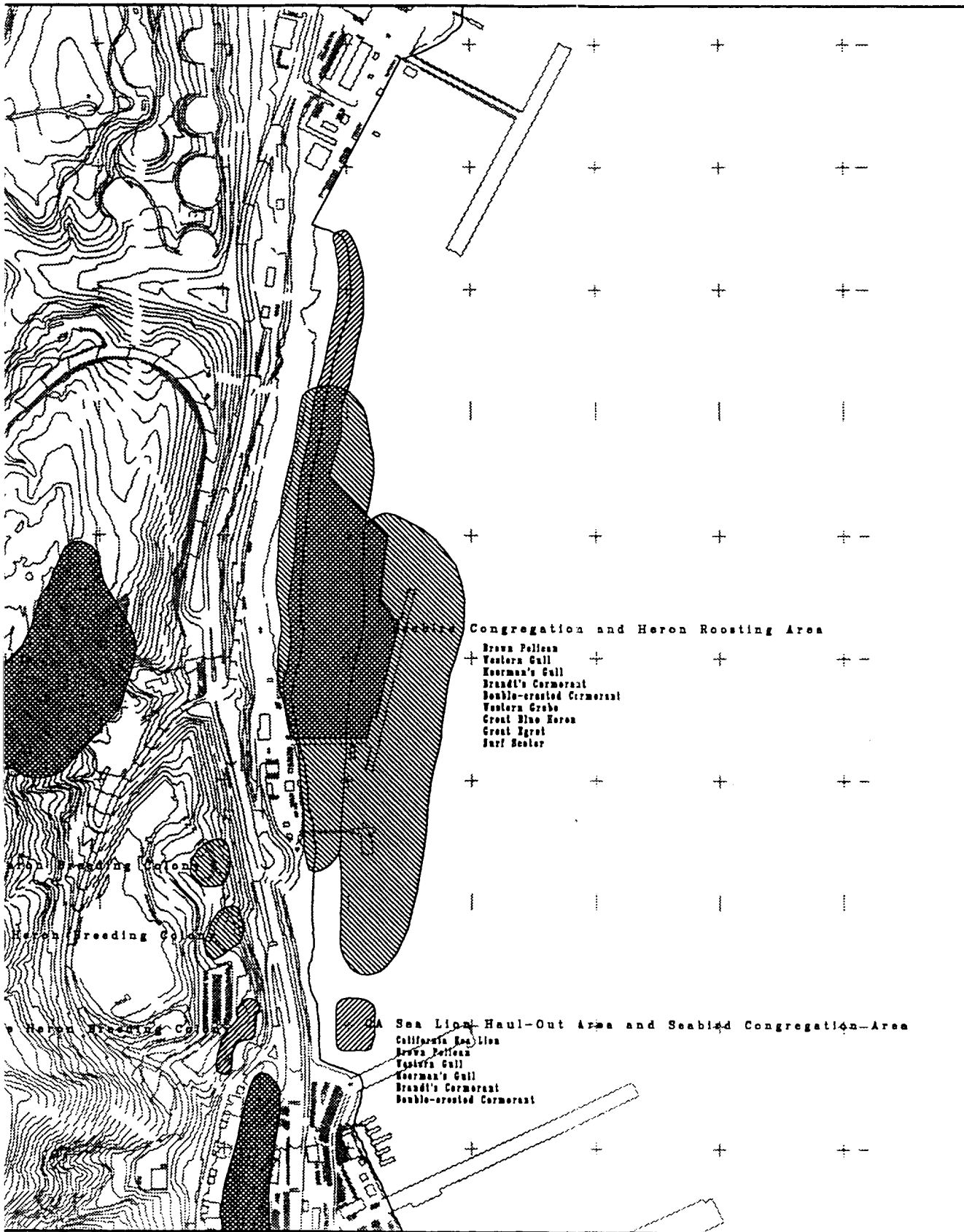
Brown pelican
 Western gull
 Heermann's gull
 Brandt's cormorant
 Double-crested cormorant
 Black-crowned night-heron
 Great egret
 Western grebe
 Surf scoter
 Loggerhead shrike

Pelecanus occidentalis
Larus occidentalis
Larus heermanni
Phalacrocorax penicillatus
Phalacrocorax auritus
Ardea herodias
Casmerodius albus
Aechmophorus occidentalis
Melanitta perspicillata
Larus ludovicianus

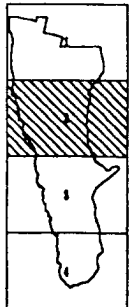
Mammals

California sea lion

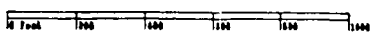
Zalophus californicus

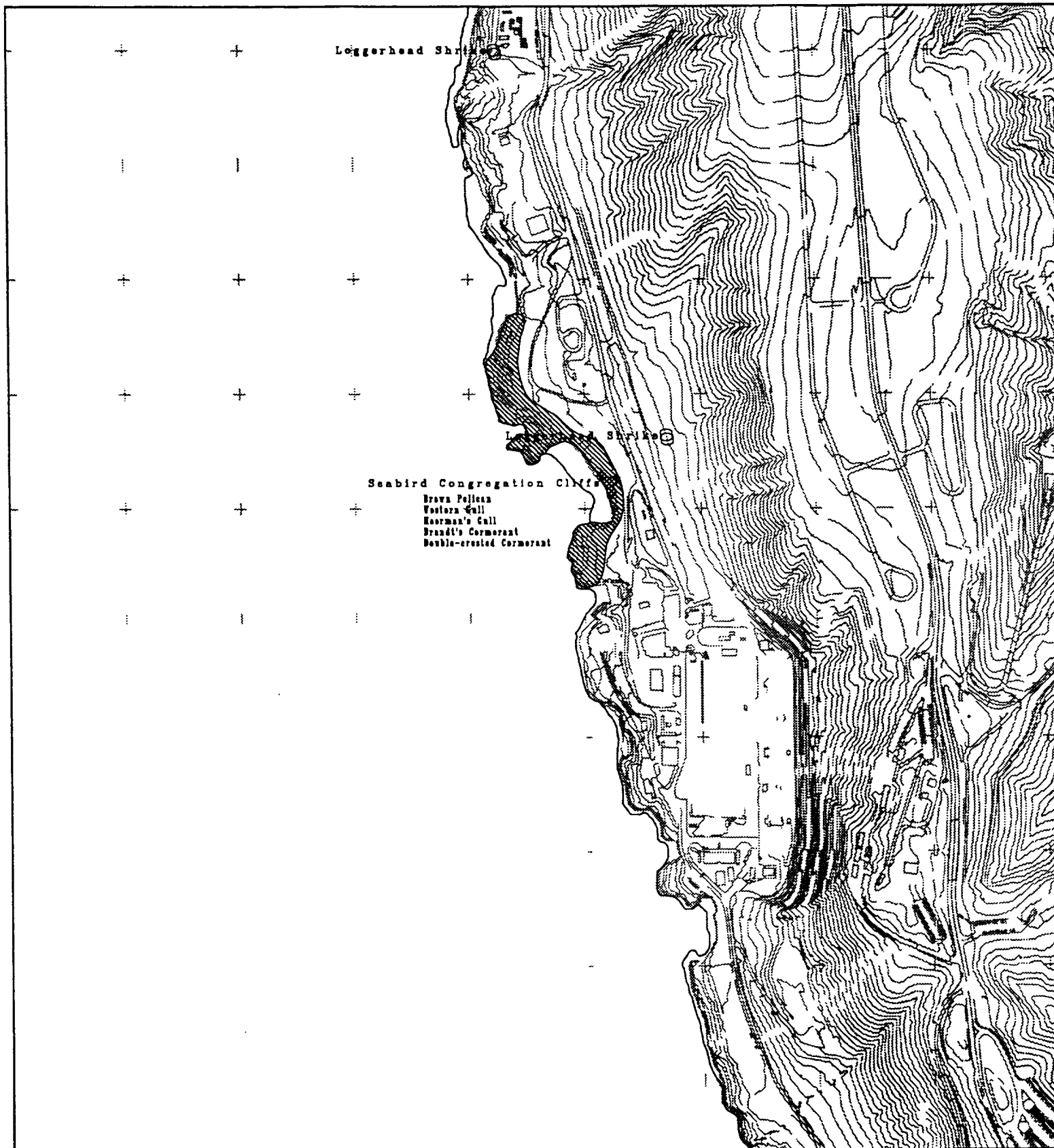


- A. hyperythrus*
- A. occidentalis californicus*
- A. californicus*
- A. neri*
- A. pentacillatus*
- A. auritus*
- A. albus*
- A. occidentalis*
- A. spicillata*
- A. leucurus*
- A. forficatus*



Sensitive Wildlife Species on Point Loma
Navy Properties, San Diego CA, 1992





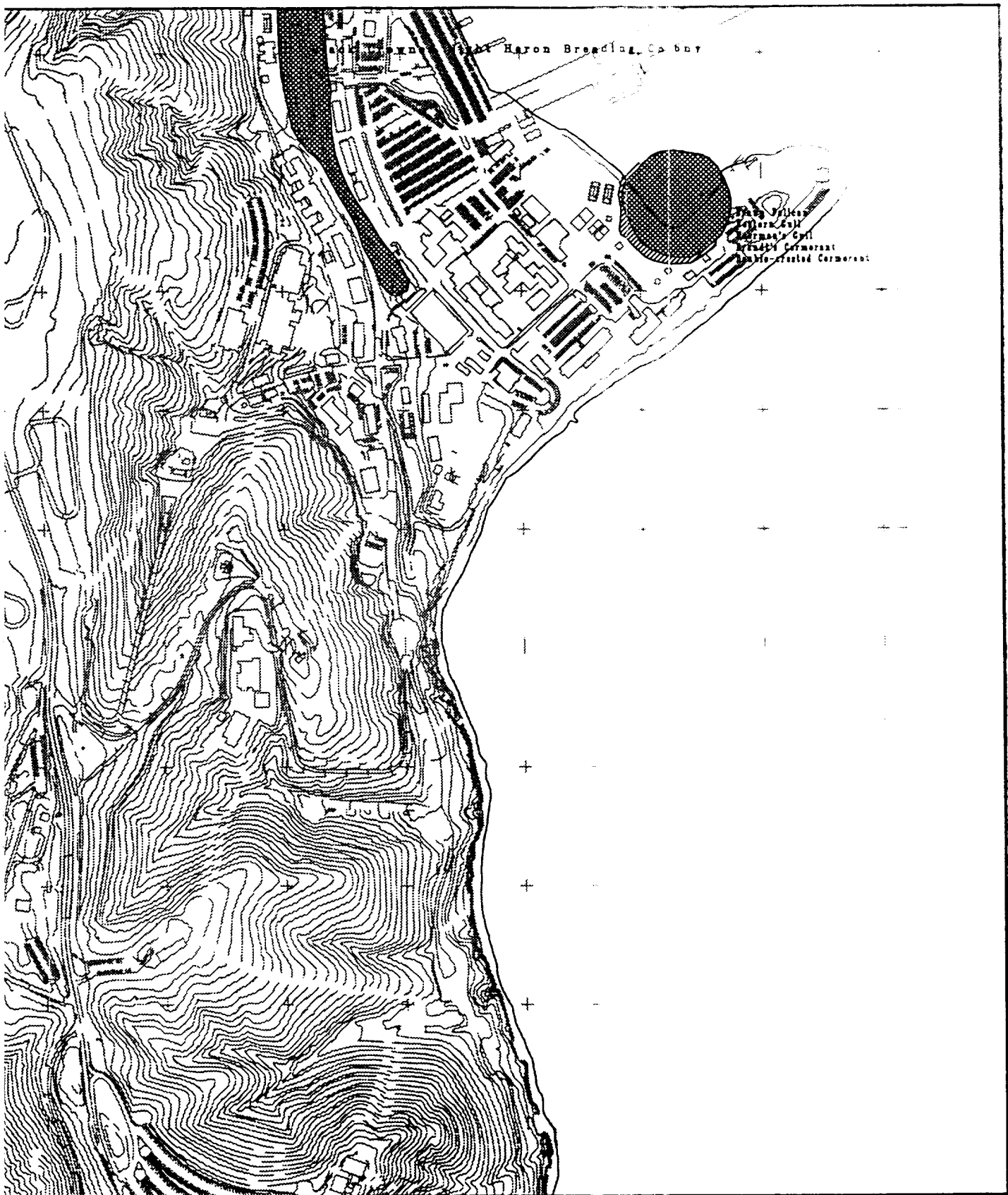
Loggerhead Shrike

Seabird Congregation Cliffs

- Brown Pelican
- Western Gull
- Heerman's Gull
- Brandt's Cormorant
- Double-crested Cormorant

- Sensitive Wildlife Species Mapped in 1981
- Sensitive Wildlife Species Mapped in 1992
- Sensitive Wildlife Species Mapped in 1981 and 1992
- ▲ Species Mapped in 1981
- Species Mapped in 1992

- | | |
|---------------------------|-----------------------------------|
| Reptiles | |
| Orange-throated whiptail | <i>Cnemidophorus hyperythrus</i> |
| Birds | |
| Brown pelican | <i>Pelecanus occidentalis</i> |
| Western gull | <i>Larus occidentalis</i> |
| Heerman's gull | <i>Larus heermanni</i> |
| Brandt's cormorant | <i>Phalacrocorax penicillatus</i> |
| Double-crested cormorant | <i>Phalacrocorax auritus</i> |
| Black-crowned night-heron | <i>Ardea herodias</i> |
| Great egret | <i>Casmerodius albus</i> |
| Western grebe | <i>Aechmophorus occidentalis</i> |
| Surf scoter | <i>Melanitta perspicillata</i> |
| Loggerhead shrike | <i>Lanius ludovicianus</i> |
| Mammals | |
| California sea lion | <i>Zalophus californicus</i> |

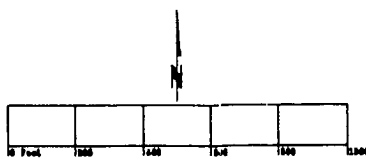


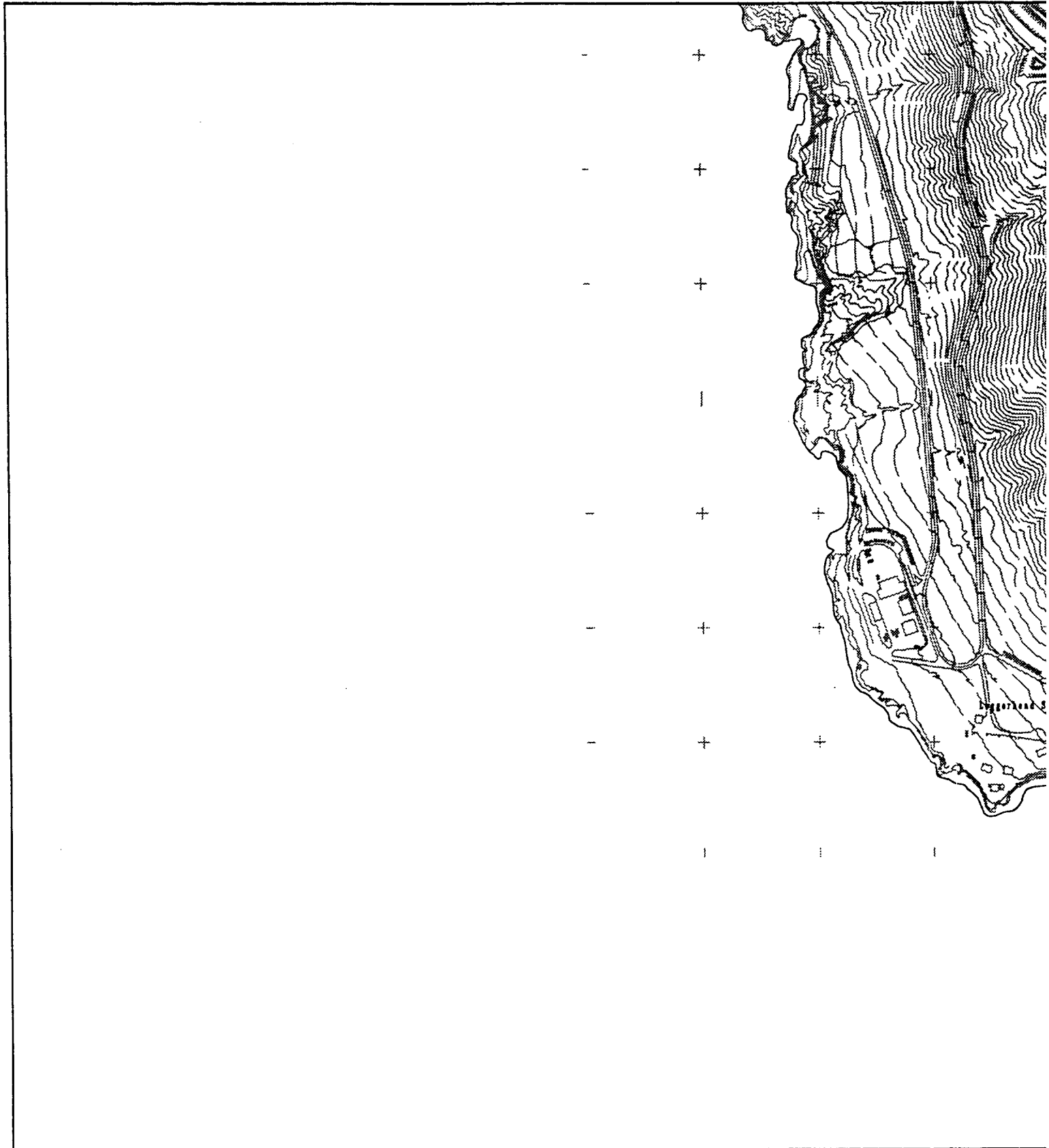
Idophorus hyperythrus




Aus californicus
occidentalis californicus
occidentalis
heermanni
oreoceras pentostylatus
oreoceras aurifus
herodias
irodius sibus
tophorus occidentalis
titia perspicillata
is ludovicianus



Sensitive Wildlife Species on Point Loma Navy Properties, San Diego CA, 1992





-  Sensitive Wildlife Species Mapped in 1981
-  Sensitive Wildlife Species Mapped in 1992
-  Sensitive Wildlife Species Mapped in 1981 and 1992

- ▲ Species Mapped in 1981
- Species Mapped in 1992

Reptiles

Orange-throated whiptail *Cnemidophorus hyperythrus*

Birds

Brown pelican *Pelecanus occidentalis*
 Western gull *Larus occidentalis*
 Heerman's gull *Larus heermanni*
 Brandt's cormorant *Phalacrocorax penicillatus*
 Double-crested cormorant *Phalacrocorax auritus*
 Black-crowned night-heron *Ardea herodias*
 Great egret *Casmerodius albus*
 Western grebe *Aschmophorus occidentalis*
 Surf scoter *Melanitta perspicillata*
 Loggerhead shrike *Lanius ludovicianus*

Mammals

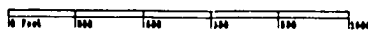
California sea lion *Zalophus californicus*



- s. hyperythrus*
- identalis californicus*
- italis*
- nni*
- penicillatus*
- aurifus*
- is*
- albus*
- occidentalis*
- spicillata*
- calanus*
- fornicus*



Sensitive Wildlife Species on Point Loma
Navy Properties, San Diego CA, 1992



ADVANCED SCIENCES, INC.

**Appendix N-Insects on Point Loma Navy Property,
San Diego, California, 1994**

Insects on Point Loma Navy Property San Diego, California

Sensitive Insect Survey Historical Survey for Sensitive Insects Comprehensive Insect Inventory

October, 1994

prepared for

Subbase Environmental
Naval Command, Control and Ocean Surveillance Center
Research, Development, Test and Evaluation Division 522
53475 Strothe Road, RM 258
San Diego, California 92152-6310

prepared by

Bruyea Biological Consulting
Guy P. Bruyea, David C. Hawks
11089 Miners Trail
Moreno Valley, California 92557

Barnes Enterprises
Martin M. Barnes
1946 Prince Albert Drive
Riverside, California 92507

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Distribution authorized to DOD components only;
premature dissemination (October 30, 1994). Other
requests shall be referred to Commanding Officer,
Naval Command, Control and Ocean Surveillance
Center RDT & E Division, San Diego, Ca. 92152-5000.

Abstract

Beginning on October 1, 1993, and extending through September, 1994, Bruyca Biological Consulting (BBC) conducted an intensive year-long field survey for sensitive and other insects on Subase and other Naval properties on the Point Loma peninsula, San Diego, California. This project was performed under contract (N66001-93-M-4908) by the Naval Command, Control and Ocean Surveillance Center (NCCOSC) Research, Development, Test and Evaluation (RDT & E) Division.

This survey resulted in the discovery of one sensitive insect species on Point Loma Navy property, the Wandering Skipper (*Panoquina errans*), a Federal C2 Candidate species for listing. This butterfly occurs on the sandy beach located to the north of the Magnetic Silencing Facility (Fig. 1) in close association with its larval hostplant, Salt Grass (*Distichlis spicata*). Although it was believed that several other sensitive insect species might occur on Point Loma, no others were located.

Several thousand insect specimens were collected and/or observed on Navy property during the survey. To date, these specimens represent 20 orders, 135 families, and several hundred species of insects. An insect inventory compiled during the one-year study is included along with detailed information about selected species of interest.

Concurrent with the above BBC project, Dr. Martin M. Barnes (MMB) conducted a thorough literature and museum specimen search for historic insect records for the Point Loma peninsula. This project also was performed under contract (N66001-93-M-5015) by NCCOSC. The BBC and MMB projects have been combined for the purposes of providing a unified report on the insects of Point Loma Navy property.

Historical records were located in several museums and literature sources for insect taxa representing 9 orders, 61 families and 135 species. A complete listing of these records is provided along with detailed information on selected species of interest. Two sensitive species have been documented to exist at Ocean Beach which is located on the Point Loma peninsula to the north of Navy property. These are the Margined Scarab Beetle (*Dinacoma marginata*) and the Federal C2 Candidate Sand Dune Tiger Beetle (*Cicindela latesignata*). There is no indication that either of these species were/are present on Navy property, although this remains a possibility.

Acknowledgments

The authors wish to express their appreciation to the numerous entomologists and field biologists whose kind assistance with museum access, specimen identification, and information on sensitive and endangered insects made this project possible. We extend our thanks to David K. Faulkner, Curator, Entomology Department, San Diego Museum of Natural History (SDMNH); Dr. Serguei Triapitsyn, Curator, and Saul Frommer, Assistant Curator, University of California, Riverside, Entomological Research Museum (UCR); Dr. Norman Penny, Curator, California Academy of Sciences, San Francisco (CAS); Dr. Lynn Kimsey and staff, University of California, Davis, Bohart Museum; Dr. John Chemsak, University of California, Berkeley, Essig Museum; and Dr. Brian Brown, Dr. Roy Snelling and Brian Harris, Los Angeles County Museum of Natural History (LACM).

We are especially indebted to Mr. Lee Guidry of Point Loma, California, for allowing us to examine his private collection of Point Loma insects. Mr. Guidry has been collecting insects on the Point Loma peninsula for over twenty years and has provided many important records of historical interest included herein. Mr. Guidry also provided (through discussion) information and field observations of his collecting experience on the peninsula and adjacent locations.

Although many of the insect identifications were made by the Principal Investigators, Dr. Martin M. Barnes, David C. Hawks and Guy P. Bruyey, a thorough documentation of the insects collected during this survey and those found in museums would not be possible without the expertise of several entomologists that deserve acknowledgment. Mr. Ron Leuschner was very helpful in determining many species of moths, especially micro-lepidoptera; Dr. Serguei Triapitsyn, UCR (parasitic Hymenoptera); Saul Frommer, UCR (Diptera); David K. Faulkner, SDMNH (Diptera); Robert E. Orth, UCR (Staphylinidae); Gregory R. Ballmer, UCR (Diptera); Dr. Norman Penny, CAS (Neuroptera); Dr. Ken Cooper, UCR (Hymenoptera); Dr. John D. Pinto, UCR (parasitic Hymenoptera); and Mr. Roy Snelling, LACM (Hymenoptera).

We would also like to thank Margorie Nelson of the United States Fish and Wildlife Service for her assistance with the current status of the Federal C1 Candidate Quino Checkerspot Butterfly (*Euphydryas editha quino*) in San Diego County. Mr. Gregory R. Ballmer (UCR), was very helpful with locality information and literature on Federally protected sensitive and endangered insect species in southern California.

Finally, our special thanks to Mary F. Platter-Rieger, Subbase Environmental, Naval Command, Control and Ocean Surveillance Center, Point Loma, California. Mary's dedication to the protection, understanding and documentation of native flora and fauna on Navy lands is truly inspiring. Our thanks to her suggestions and guidance throughout the course of this project.

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1. Introduction

From October 1, 1993, through September, 1994, contracts to investigate the insect inhabitants of Navy property on Point Loma, San Diego, California, were performed by Bruyey Biological Consulting (BBC) and Barnes Enterprises personnel. These projects consisted of a thorough survey for sensitive and other insects currently inhabiting Navy property on Point Loma performed by Guy P. Bruyey and David C. Hawks of BBC, and a survey of literature and museum records representing the historical presence of insects on Point Loma performed by Martin M. Barnes. Separate species lists are provided for current and historical records. However, records are combined in the detailed accounts of sensitive and other selected insect species.

1.1 Insect Habitats on Point Loma

Navy-owned property on the Point Loma peninsula includes approximately 633 acres of undeveloped native coastal vegetation and wildlife habitats. In biogeographical terms, Point Loma may be viewed as an ecological "island" since it is surrounded by the waters of the Pacific Ocean to the west and south, the San Diego Bay to the east, and by private developed "non-habitat" to the north (Fig. 2). This peninsula especially represents an isolating island to organisms with poor dispersal capabilities such as many species of insects. For this reason (among others), it is of interest to develop a baseline inventory of past and present insect inhabitants of Point Loma, thereby enabling future entomological inventory and other research to make appropriate comparisons of insect population or species composition characteristics through time.

The following information is abstracted from the document prepared by Advanced Sciences, Inc. (1993). The Point Loma peninsula has a Mediterranean climate with cool wet winters and warm dry summers. It receives a total annual average rainfall of 9.5 inches. Plant communities found on Navy property consist primarily of drought-tolerant brushland types, which are well adapted to the semiarid maritime climate that is typical of coastal southern California. Plant communities inhabiting Point Loma are comprised of a diverse assemblage of more than 117 native and 53 introduced plant species. Five basic natural plant communities, totaling approximately 600 acres, have been identified and mapped on Navy property. These are: 1) Southern Maritime Chaparral, 2) Maritime Sage Scrub, 3) Southern Coastal Bluff Scrub, 4) California Grassland, and 5) Southern Fore-dune Vegetation.

Except in the cases of relatively few predators, omnivorous herbivores, or highly vagile species (such as dragonflies and some butterflies), insect species are closely linked to a particular hostplant or habitat type. Several of the insect species described in detail in this report exemplify some of the many strategies and niche partitioning characteristics of insects inhabiting Point Loma.

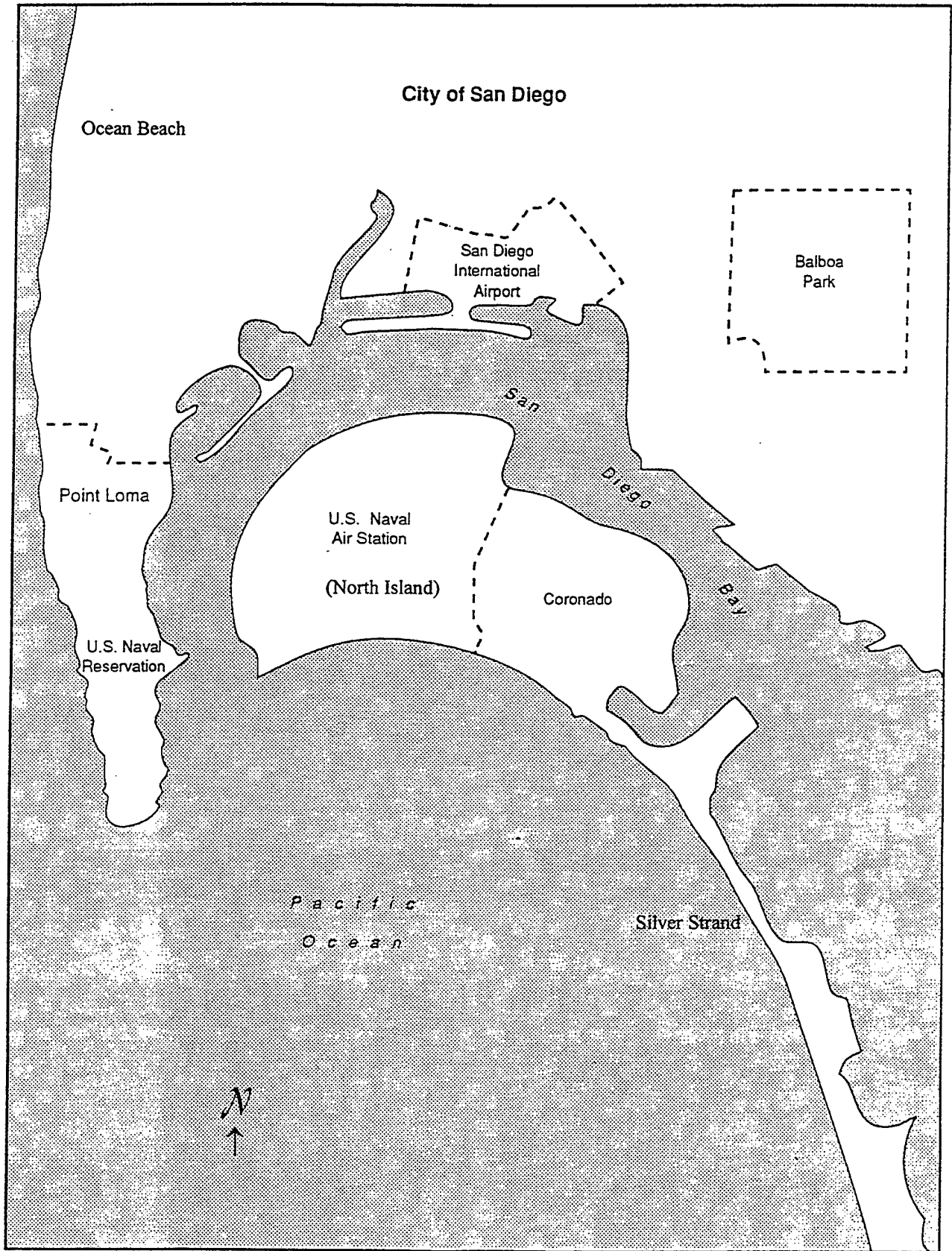


Figure 2. San Diego Bay area including Point Loma and other sites discussed in report.

1.2 Sensitive Insect Survey

A primary goal of field work conducted by BBC was to determine the presence, distribution and ecology of any sensitive insect species found on Navy property on Point Loma. In this vein, greater field time was expended surveying areas believed to contain potential habitat for sensitive insects due to the presence of known hostplants or other habitat characteristics. Six sensitive insect species were selected as possibly occurring on Navy property on Point Loma due to the previously documented occurrence of potential habitat, or because known sites are located in the vicinity of Point Loma. These are the Federal C1 Candidate Quino Checkerspot Butterfly (*Euphydryas editha quino*), four Federal C2 Candidates as follows: Sandy Beach Tiger Beetle (*Cicindela hirticollis gravida*), Sand Dune Tiger Beetle (*Cicindela latesignata*), Hermes Copper Butterfly (*Lycaena hermes*), Wandering Skipper Butterfly (*Panoquina errans*), and the Margined Scarab Beetle (*Dinacoma marginata*) which is believed worthy of protection by several entomologists and is under consideration for Federal status by the U. S. Fish and Wildlife Service (M. Nelson, USFWS, pers. comm.).

1.3 Historical Records Survey

Concurrent with field studies at Point Loma, Dr. Martin M. Barnes conducted literature and museum searches for historical records of insects found on Point Loma. Specifically, the scope of this study was to determine the historical presence and location on Point Loma of all insects currently considered sensitive by the U. S. Fish and Wildlife Service and/or other organizations, and all other insects of potential concern or interest. In the cases of sensitive insect species believed to possibly occur on Point Loma, all records from localities in coastal southern San Diego County were obtained. This information allowed for comparisons to be made between known conditions on Point Loma and those of these other nearby sites.

1.4 Current Insect Inventory (1993-1994)

In addition to the survey for sensitive species, BBC conducted an intensive survey for other insect species occurring on Navy property on Point Loma. Ecological and life history information was collected when possible. A reference collection of preserved insect specimens from this study was prepared and identified to whatever level was possible by BBC personnel and other insect taxonomists. The collection will be housed at the University of California, Riverside, Entomological Research Museum. Identifications are ongoing, and updated species lists will be prepared on a regular basis and provided to Subase Environmental. Comparisons of present and historical records were made for the purposes of this report. However, due to ongoing specimen identification, these comparisons must be considered preliminary.

2. Methods

2.1 Insect Inventory Methods

2.1.1 Insect Sampling Techniques

Collection methods can be divided into two categories, "passive" and "active" methods. Passive methods involve selecting trapping sites, installing traps, and harvesting trap catches on a regular basis. Active methods involve visually searching for and/or selectively collecting specimens found on plants or other substrates or at attraction sources such as ultraviolet lights or bait stations. Some sites on the peninsula were established as permanent sampling and monitoring sites while other areas were sampled by a systematic rotation of methodologies.

Passive collection methods consist of pitfall and yellow pan traps, which were installed more or less randomly in several localities, and flight intercept traps, which were set up in strategic localities to afford the best possible sampling in the various habitat communities. Traps were designed and installed in such a way that non-target organisms (vertebrates) could not be captured or harmed. These traps were maintained regularly, and samples were collected approximately every other week during the one-year survey period. When possible, and especially during periods of high activity for flying insects, trapping locations were rotated (within a given habitat type) every two to four weeks.

Diurnal surveys on foot were conducted throughout as much of the Navy property on Point Loma as possible. BBC personnel surveyed at least a portion of each of the major habitat types during each visit. Special emphasis was placed on surveying areas believed to represent potential habitat for sensitive insect species due to the presence of known hostplants, suitable soil types or other ecological conditions believed to be important. During these field surveys, BBC researchers collected and observed invertebrates found flying, on various substrates such as on plants, on the ground, in leaf litter, or in aquatic situations. Leaf litter was collected each month from each of the habitat types and the extremely small invertebrates contained therein were extracted using berlese funnels. Additional small invertebrates were sampled from plants with the aid of sweep nets and beating sheets. Some invertebrates, such as ants, were best collected with the use of an aspirator. Life history and other host association data was collected when possible. During at least one night per month (and two to three times per month from May through August), BBC researchers set up a 175 watt mercury vapor lamp (powered by a gas generator) and a ground sheet at locations anticipated to produce cross-sectional samples of nocturnal (primarily flying) insects.

2.1.2 Curation of Insect Specimens

All specimens collected during the year-long survey were prepared and labeled and were classified to whatever level possible. A reference collection was established and will be utilized for ongoing identification work.

Most adult insect specimens were mounted on insect pins, labeled, and stored in California Academy style specimen drawers, which in turn are housed within 24 drawer specimen storage cabinets. Soft bodied insects (such as Termites) have been stored in glass vials containing 70% ethanol. The reference collection will be maintained and curated at the office of Bruyera Biological Consultants until all identifications have been received from qualified taxonomic specialists.* At that time, this collection of Point Loma insect specimens will be transferred to the University of California, Riverside, Entomological Research Museum. A subset of the reference collection may be deposited at the Los Angeles County Museum of Natural History.

* The identification process for this material may take from several months to several years.

2.2 Historical Insect Records Methods

2.2.1 Historical Literature Survey

A literature search of pertinent publications concerning sensitive and other insect species of Point Loma was conducted. Of particular value was the entomological library of the San Diego Museum of Natural History. All other applicable literature was located in the Bio-Agricultural Library at the University of California, Riverside. Computerized literature searches were conducted utilizing various databases such as Agricola, Biosis and Melvyl (a catalog of University of California systemwide holdings). The Agricola (Agricultural Online Access) database contains bibliographic records of materials acquired by the National Agricultural Library and cooperating institutions in the agricultural and related sciences. Agricola covers various fields of agriculture including agricultural economics, entomology, horticulture, plant diseases, soils and other topics. Agricola provides worldwide coverage of the agricultural literature. Biosis includes citations and abstracts from more than 9,000 periodicals. Subject coverage includes traditional areas of biology, including botany, zoology, molecular biology, and microbiology as well as related fields such as plant and animal systematics and ecology. Information on the historical presence of sensitive insects found on or near Point Loma was abstracted for the present report. Historical records of non-sensitive insects are provided only for those species recorded from Point Loma.

2.2.2 Historical Specimen Survey

Intensive searches for Point Loma insect specimen records were performed at all major California entomological collections. These are: San Diego Museum of Natural

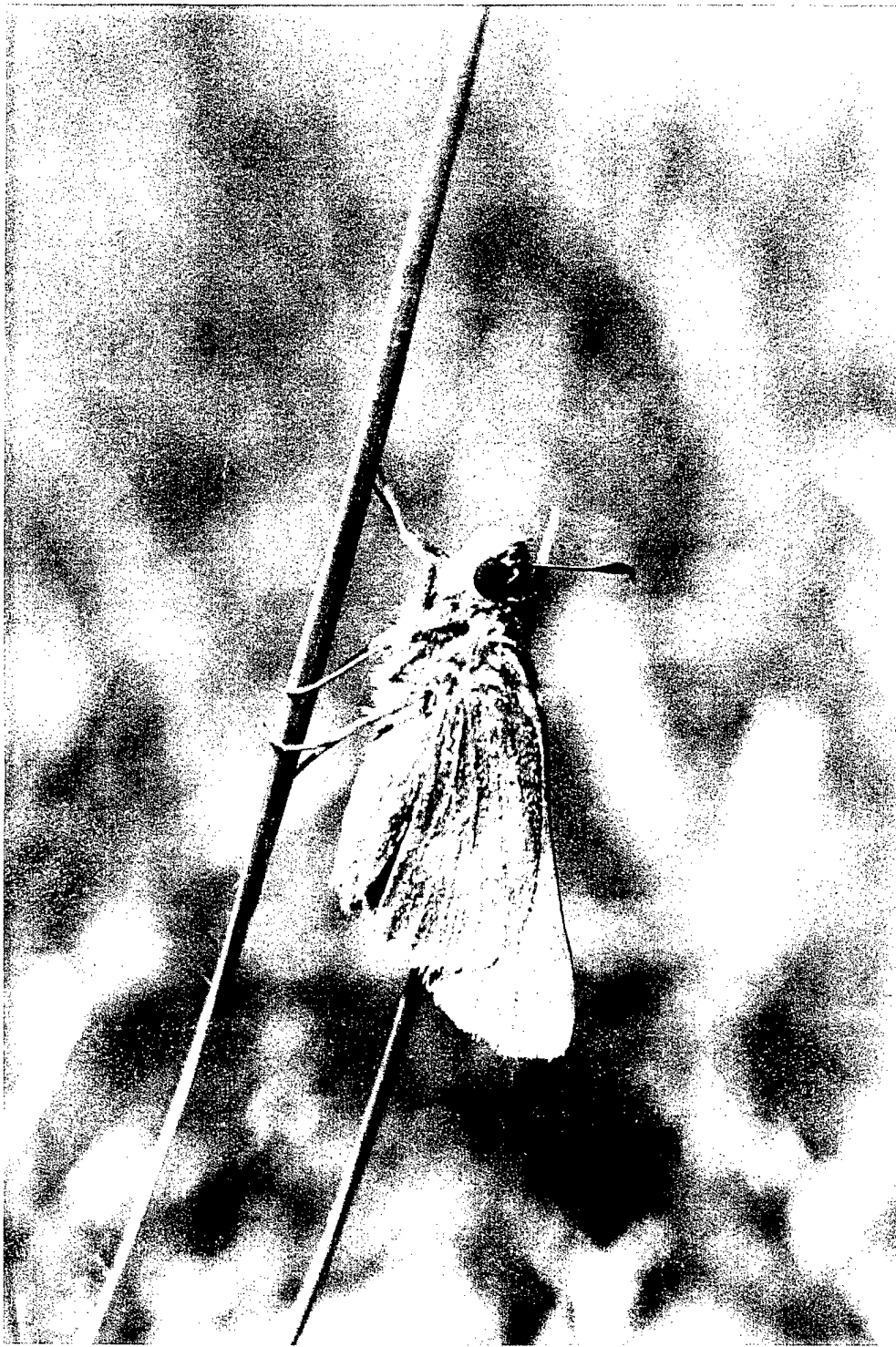


Figure 1. The Wandering Skipper Butterfly (*Panoquina errans*), a Federal C2 Candidate Species for listing by the U. S. Fish & Wildlife Service, perched on its larval hostplant, Salt Grass (*Distichlis spicata*), on Point Loma Navy property.
Photograph by Guy P. Bruyea, April, 1994.

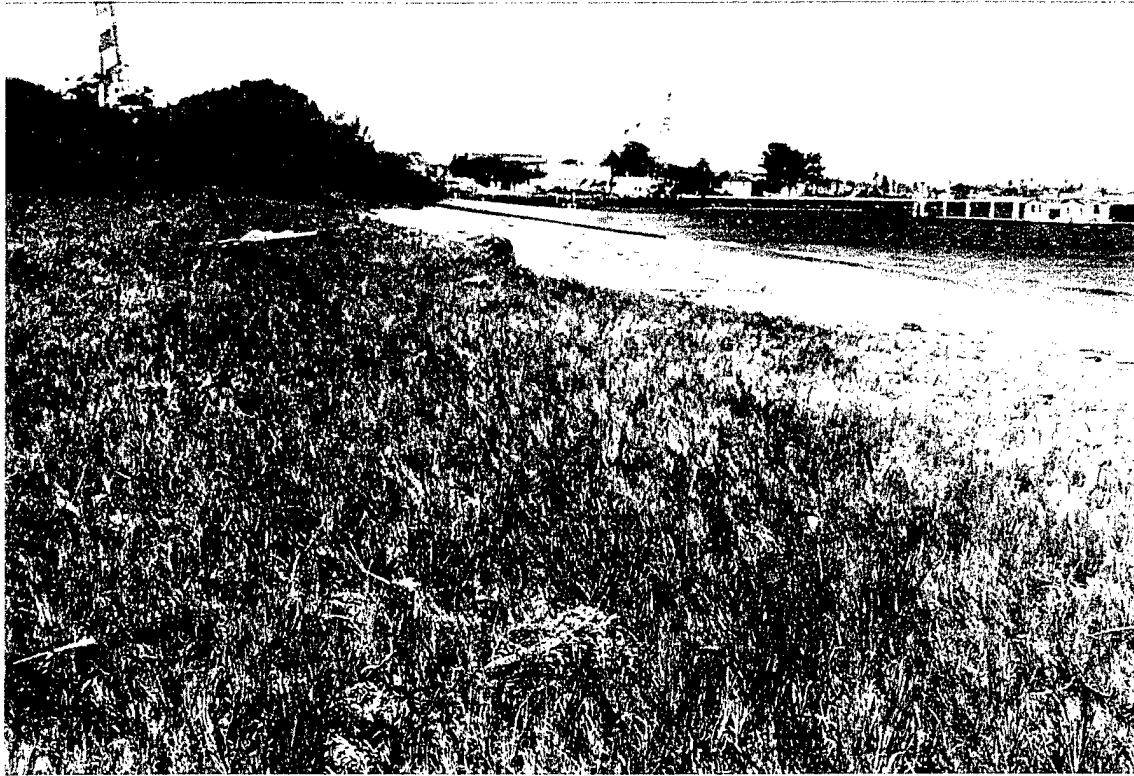


Figure 4. Salt Grass (*Distichlis spicata*) habitat on Point Loma Navy property just north of the Magnetic Silencing Facility. View is facing north towards NRaD buildings. This beach area on San Diego Bay is home to the Federal C2 Candidate Wandering Skipper, *Panoquina errans*.
Photograph by Guy P. Bruyey, April, 1994.



Figure 5. Female Wandering Skipper Butterfly (*Panoquina errans*), center, ovipositing on Salt Grass (*Distichlis spicata*). Note the Ice Plant (*Mesembryanthemum edule*) that has invaded this *Distichlis* habitat on Point Loma Navy property (see also Figure 4).
Photograph by Guy P. Bruyee, April, 1994.

History, California Academy of Sciences, University of California (Riverside, Berkeley, and Davis), and the Los Angeles County Museum of Natural History. The private collection of Mr. Lee Guidry, who has collected insects on the Point Loma peninsula for over 20 years, also was examined. Special attention was given to the six sensitive insect species believed to possibly occur on or near Point Loma. Specimen records of non-sensitive insects were noted only for those species recorded from the Point Loma peninsula.

A number of unidentified insect specimens from Point Loma were found in a few of these collections, and these were borrowed for identification purposes. Some of these have been identified and are included in this report. Others await identification by appropriate specialists.

3.1 Sensitive Insect Survey

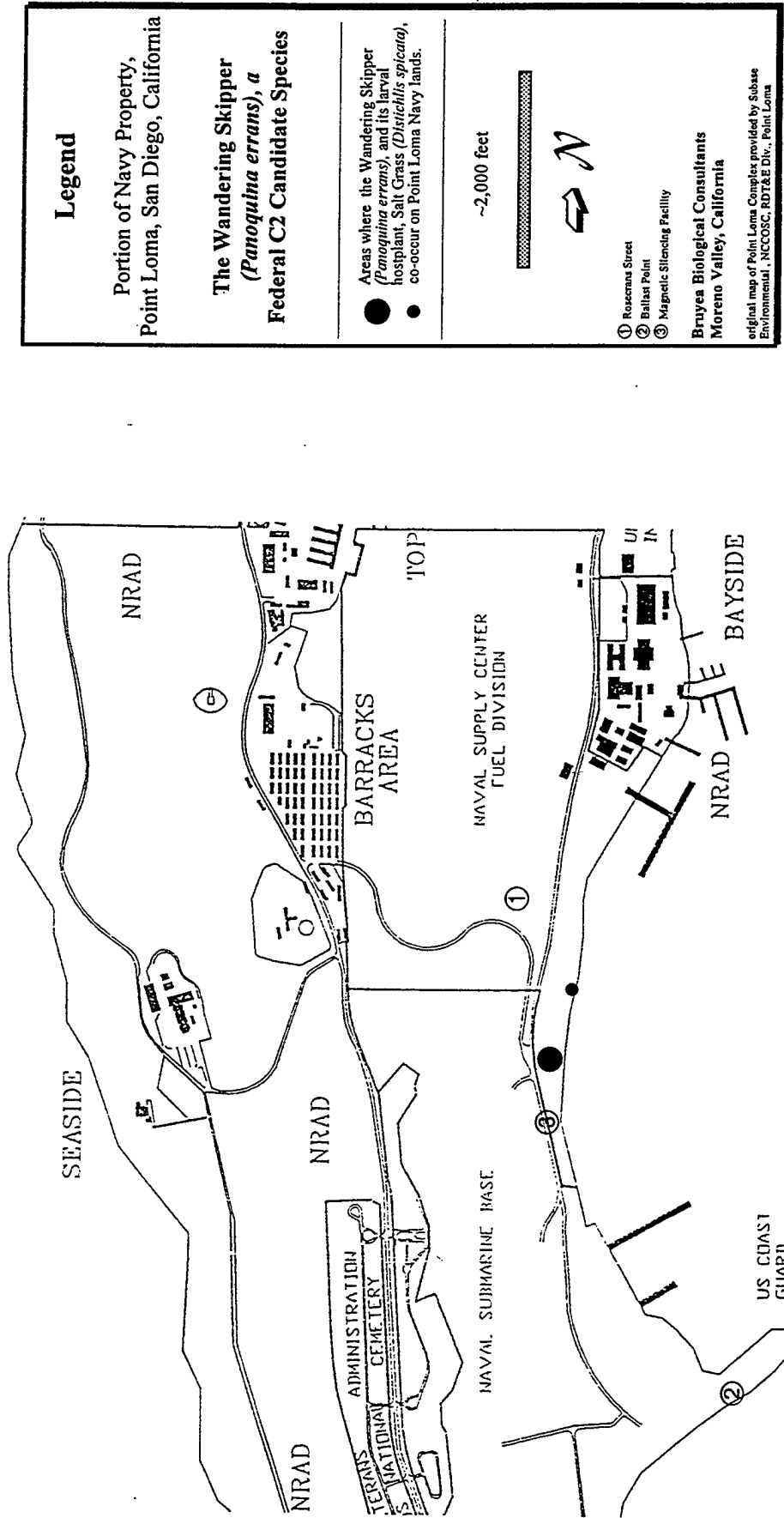
The sensitive insect survey performed by BBC personnel documented the presence of one sensitive insect species on Point Loma Navy property: the C2 Federal Candidate Wandering Skipper Butterfly, *Panoquina errans* (Fig. 1). Detailed information on this species, and its occurrence on Navy property is provided below. We also include recommendations for *P. errans* habitat conservation and improvement (section 3.2.2).

3.1.1 The Wandering Skipper, *Panoquina errans* (Skinner)

This small (about one-inch wingspread) butterfly is listed as a Federal C2 Candidate species by the United States Fish and Wildlife Service. This species occurs in localized colonies along the coast of southern California from the Santa Barbara area southward along both coasts of Baja California, Mexico. It is associated only with its larval hostplant, Salt Grass, *Distichlis spicata* (L.) Greene, which grows primarily in sandy habitats along beaches, bluffs and estuaries. In southern California, this species is active as an adult during several generations from March to November.

Several specimens of *P. errans* were first found by BBC personnel in October, 1993, on the bayside beach area located just north of the Magnetic Silencing Facility (Figs. 3, 4). In 1994, adult *P. errans* at this colony site were observed from March through September. These butterflies are associated with two patches of *Distichlis spicata*, located approximately ten meters from the water's edge. The southernmost patch of Salt Grass occupies approximately one-half acre, while the second patch occupies perhaps ten square meters. *Distichlis* was also discovered to occur in a small area near the tower on "Fuel Farm" property. However, no *P. errans* individuals were observed at this site and we believe that other characteristics of this site make it unsuitable as habitat. The beach area described above may prove to be the only locality for this insect on Point Loma.

Figure 3. Locational Chart of the Wandering Skipper (*Panoquina errans*) on Point Loma Navy Lands



The early stages of this butterfly were described by Comstock (1930). The egg is white, spherical and has a flattened bottom. The mature larva is green with a dark green mid-dorsal stripe and a lateral band of yellowish-white. The pupae are attached by a silk girdle and cremaster and are oriented head up on *Distichlis* stems. The pupa is greenish-brown in color and has a prominent palpal case projecting forward from the head. Adult butterflies at the Navy property colony were observed flying mostly within the boundaries of the Salt Grass patches, and perching on grass stems, Ice Plant and other vegetation. *Panoquina* individuals often were observed to obtain nectar from flowers of California Buckwheat (*Eriogonum fasciculatum*) and Golden Bush (*Haplopappus* sp.), sometimes outside of the *Distichlis* patches.

3.1.2 Conservation of *Panoquina errans* Habitat on Navy Property

The beach Salt Grass habitat located north of the Magnetic Silencing Facility is the only site of its kind on Point Loma Navy property. As such, it is important to preserve and desirable to improve this area for the invertebrates and other organisms that live there. Of primary importance is the maintenance and improvement (if possible) of the patches of Salt Grass (*Distichlis spicata*), which is the larval hostplant of the Federal C2 Candidate Wandering Skipper Butterfly, *Panoquina errans*. The most conspicuous potential threat to these Salt Grass patches is from non-native Ice Plant (*Mesembryanthemum edule*) which has invaded this beach and some portions of the *Distichlis* areas (Fig. 5). In some areas the Ice Plant has completely replaced all native plant species. BBC recommends that the Ice Plant be incrementally removed from Salt Grass habitat, and that these removal areas be monitored in order to establish that the Salt Grass will, indeed, reinvade or become more dense. If removal from small areas (perhaps 10-square-meter patches, initially) produces desirable results, then we recommend removing all Ice Plant from the beach area, as it serves no purpose there and is highly competitive against most native plant species. Trash, cables, and other unnecessary man-made objects also should be removed from the beach area, if possible.

3.1.3 Sensitive Species Accounts

Although the following sensitive species were not found on Navy property during the present survey, one or more may eventually be found to occur. As described earlier, cool, overcast weather conditions during the spring and summer of 1994 may have reduced the effectiveness of our survey efforts. Table 3-1 lists status and hostplant or habitat requirements of each of these species.

Quino Checkerspot (*Euphydryas editha quino*)

The Quino Checkerspot Butterfly is known to exist only as a few, probably isolated, colonies in southwestern Riverside County. It once occurred abundantly at several other sites in San Diego, Orange and Riverside Counties. An intensive survey for

Table 3-1

Sensitive Insect Species of Concern During the 1993-1994 Sensitive and Historical Surveys

Scientific Name	Common Name	Federal Category	Hostplant or Habitat needs
<i>Euphydryas editha quino</i>	Quino Checkerspot Butterfly	C1 ^a	<i>Plantago erecta</i>
<i>Lycaena hermes</i>	Hermes Copper Butterfly	C2	<i>Rhamnus crocea</i>
<i>Panoquina errans</i> *	Wandering Skipper	C2	<i>Distichlis spicata</i>
<i>Cicindela hirticollis gravida</i>	Sandy Beach Tiger Beetle	C2	sandy beach/dune
<i>Cicindela latesignata</i>	Sand Dune Tiger Beetle	C2	sandy beach/dune
<i>Dinacoma marginata</i>	Margined Scarab Beetle	NL	sandy areas

^a A hearing was recently conducted in October, 1994, to address the proposed rule to Federally list the Quino Checkerspot Butterfly as Endangered. The Federal Status of this insect may be elevated in as few as 12 months.

* present on Point Loma Navy Lands

C1. Category 1 Candidate. Taxa for which the United States Fish and Wildlife Service has, in its possession, sufficient information to support a proposal to list as endangered or threatened.

C2. Category 2 Candidate. Taxa for which the United States Fish and Wildlife Service has, in its possession, information indicating that listing is possibly appropriate but for which the Service lacks substantial information upon which to base a proposal to list as endangered or threatened.

NL. Not Listed. Taxa for which the United States Fish and Wildlife Service is compiling information and has not decided on a Federal Category designation to date.

E. e. quino south of Lake Mathews near Riverside by Hawks and Bruyca in 1992 failed to locate this species although it had occurred there as recently as the mid-1980's (G. F. Pratt, pers. obs.). In the San Diego area, several strong colonies existed until the early 1980's. All of these colonies are now believed to be extinct, perhaps due to habitat fragmentation, drought, or other factors. Causes for the apparently sudden near extinction of the Quino Checkerspot remains a mystery. However, Ballmer and Hawks (in prep.) have proposed that one of the explanations for the demise of Quino Checkerspots is the possible effect on the early stages by non-native predators such as earwigs and sowbugs which appear to be spreading into natural areas from the ever-growing southern California urban areas.

The Quino Checkerspot is associated with clearings and clay meadows inhabited by the larval hostplants, *Plantago erecta* and *Orthocarpus purpurascens*, in coastal sage scrub and chaparral habitats. A great deal is known about the life history of *E. e. quino* (e.g. Emmel & Emmel, 1973, and Orsak, 1977), with the exception of larval overwintering site characteristics and parasite/predator relationships.

Although a known hostplant, *Plantago erecta*, occurs on Point Loma, no historical records exist indicating that this species ever occurred on the peninsula. Furthermore, current survey work by BBC failed to locate this species on Navy property. BBC personnel are familiar with habitat characteristics of past and present Quino Checkerspot colony sites and it is our opinion that habitat for this butterfly does not exist on Navy property on the Point Loma peninsula.

Sandy Beach Tiger Beetle (*Cicindela hirticollis grvida*)

Sand Dune Tiger Beetle (*Cicindela latesignata*)

These Tiger Beetle species are inhabitants of sandy beach and dune habitats along the coast of southern California and northern Baja California. Several San Diego area localities exist for these species, although there is no indication that either species was/is present on Navy property on Point Loma. The Sand Dune Tiger Beetle, however, was known to exist at Ocean Beach just to the north of Navy property, and both species are known from Silver Strand and other San Diego Bay sites to the east and southeast of Point Loma. Larval and adult tiger beetles are voracious predators. The larvae live in burrows in hard-packed or damp sand from which they capture with their large mandibles other small insects that pass by. Adults actively search for prey by rapidly running and flying over their beach or dune habitats.

We believe that the best potential habitat on Navy property for one or both of these tiger beetle species is on the sandy beach just north of the Magnetic Silencing Facility (site of *Panoquina errans* colony). BBC personnel surveyed this beach at least twice each month without observing adults or larval burrows of either species of *Cicindela*. The colonizing capabilities of these species is not known. However, it seems

possible that one or both may be able to colonize this beach in the future, if they are indeed presently absent.

Margined Scarab Beetle (*Dinacoma marginata*)

Interestingly, the probable type-locality (i.e. the original collection locality for the species) according to Blaisdell, 1930, is Ocean Beach, which is north of Navy property on Point Loma. The original description by Casey, 1886, lists the type-locality as "southern California," but Blaisdell claims that the type specimens "undoubtedly" were collected by Mr. Field in June and July at dusk in Ocean Beach. More recent records of this species are from Del Mar, although suitable habitat (coastal stabilized sandy areas) may still exist at Ocean Beach.

Efforts to locate this species on Navy property were unsuccessful, although suitable habitat may exist in the area to the south of Sunset Cliffs. This three-quarter inch long beetle is difficult to survey for based upon observations by Hawks and several other coleopterists. This is due to its crepuscular (at dusk) flight behavior, its weak attraction to ultraviolet collecting lights, and the fact that nothing is known of its life history.

Hermes Copper (*Lycaena hermes*)

This distinctive yellow and brown butterfly is unique in that it has no close relatives and occurs only in scattered, localized colonies in western San Diego County and northern Baja California. Several colony sites in San Diego have been extirpated by urbanization and other development. However, it is not in danger of extinction at this time due to the existence of several very strong populations in the foothills of the Laguna Mountains that are not threatened by development.

The larva of Hermes Copper feeds on the leaves of the Spiny Redberry (*Rhamnus crocea*) during the Spring months when its hostplant has new tender growth. The adult butterflies are active during May and June. The adults obtain nectar from the flowers of California Buckwheat (*Eriogonum fasciculatum*) and other plants. While *Rhamnus crocea* and suitable nectar sources are present on Point Loma Navy property, this butterfly was not located during surveys by BBC personnel. Additionally, no historical records exist indicating the presence of this species on Point Loma.

3.2 Historical Records

Results of the search for historical records of insects of Point Loma consist of information from the literature as well as from museum and private collection specimens. The search for historical records of insects found on the Point Loma peninsula resulted in records of taxa representing 9 Orders, 61 families, and 135 species. A number of other species were identified only to the genus level (16 genera) or the family level (9 families).

These are presented in list form in Table 3-2. In addition to computerized searches involving specific key words, the following periodicals and field notes were searched for information on insects of Point Loma:

Transactions of the San Diego Society of Natural History
Proceedings of the San Diego Society of Natural History
Environment Southwest, San Diego Society of Natural History
Bulletin of the California Insect Survey
Journal of Research on the Lepidoptera
Journal of the Lepidopterists' Society
Journal of the Coleopterists' Society
Pan Pacific Entomologist
Journal of the California Academy of Sciences
Wasmann Journal of Biology
Field Notes of Mr. Fred Thorne, dated 1927 to 1979. Entomology Department,
San Diego Museum of Natural History.

Very little has been published on insects of the Point Loma peninsula. A summary of available information from both literature and specimen collection sources concerning the six sensitive insect species is provided below.

Sandy Beach Tiger Beetle (*Cicindela hirticollis gravida*)
Sand Dunes Tiger Beetle (*Cicindela latesignata*)

No Point Loma records have been found to date, although many records of these two species exist from nearby localities such as North Island, Silver Strand and Imperial Beach. One record of *C. latesignata* from Ocean Beach (north of Navy property) was found in the California Academy of Sciences collection.

Margined Scarab Beetle (*Dinacoma marginata*)

As mentioned earlier (section 3.1.3), the probable type-locality is Ocean Beach (Blaisdell, 1930), which is north of Navy property on Point Loma. The original description by Casey, 1886, lists the type-locality as "southern California," but Blaisdell claims that the type specimens "undoubtedly" were collected by Mr. Field in June and July at dusk in Ocean Beach. The only other more recent (1960's) San Diego County records of this species are from Del Mar. There is no historical evidence that this species occurred on Point Loma Navy property.

Wandering Skipper (*Panoquina errans*)

No *historical* Point Loma records have been found. However, specimens are known from Coronado, National City, Imperial Beach, and other coastal areas of San Diego County. As discussed earlier, *P. errans* presently occurs on Point Loma Navy property.

Quino Checkerspot (*Euphydryas editha quino*)
Hermes Copper (*Lycaena hermes*)

No historical records indicating the occurrence of these species on Point Loma were found.

3.3 Current Insect Inventory (1993-1994)

The insect inventory survey work was conducted from 1 October 1993 to 30 September 1994. During this period several thousand insect specimens were collected and/or observed on Point Loma Navy property. As indicated in the discussion of the survey for sensitive insects, weather conditions on Point Loma during the survey period were unseasonably cool and overcast which undoubtedly hindered our surveying efforts.

The results of the insect survey by BBC personnel are presented in list form in Table 3-3. To date, specimens and observations collected during this survey represent 20 orders, at least 135 families, and several hundred species of insects. 173 taxa have been identified to the species level. Many species have been identified to the generic level only (86 genera), and others only to the family level (38 families). Many specimens are still in the process of being identified by a number of taxonomic specialists throughout North America. As additional identifications become available, BBC will amend this list and make all updates available to Subbase Environmental, NCCOSC.

3.3.1 Accounts of Selected Species

The following four species are discussed in detail since their occurrence on Point Loma is unusual or of special interest. None of these species are considered to be sensitive. Table 3-4 also provides information on other species of insects recorded from Point Loma, but that are probably not true inhabitants of the peninsula.

Comstock's Agave Skipper (*Agathymus comstocki*)

This large (about two-inch wingspread) skipper butterfly possibly once flew on Point Loma in association with its larval hostplant, *Agave shawii*. According to Emmel & Emmel (1973), this *Agave* species was once abundant on Point Loma prior to housing and other development. They believe that *A. comstocki* probably occurred on the peninsula. Presently, this giant skipper is found only in Baja California in association with *Agave shawii*. No Point Loma specimens are known to exist.

Pipevine Swallowtail (*Battus philenor*)

A single worn specimen of this butterfly was found in the SDMNH collection which was collected on Point Loma in the summer of 1924. This record is of interest

because this species is native to Mexico and southeastern Arizona, and occurs only as a rare stray in southern California. Its hostplant, Pipevine (*Aristolochia* sp.), is not found in southern California.

Clavipe's Day Sphinx Moth (*Aellopos clavipes*)

One specimen of this tropical Sphinx Moth was collected by Mr. Lee Guidry on Point Loma in 1977. This species was described from Guadalajara, Mexico, and is known only as a rare stray into the United States. Several specimens are known from southern Texas. However, Mr. Guidry's Point Loma specimen represents the first known record of this species for the state of California. The life history of *A. clavipes* is unknown; however, it is highly unlikely that this species could become established on Point Loma or elsewhere in southern California.

Eucalyptus Longhorn Borer (*Phoracantha semipunctata*)

This Australian beetle was accidentally introduced into southern California in the early 1980's. The first recorded sighting was near El Toro in Orange County in 1984 (Hogue, 1993). One specimen from Point Loma was found in the SDMNH collection dated 1988. The insect survey by BBC also identified this species as being resident on Navy property on Point Loma. Prior to the introduction of this beetle, *Eucalyptus* trees were virtually free of insect pests. However, in the short time that this species has been present in southern California, it has killed many *Eucalyptus* trees.

These beetles probably only attack trees weakened by lack of moisture, disease, or other stresses. Damage by the larvae may be extensive because of their large size (length of up to two inches), and because they form deep, broad galleries under the bark and, as they reach maturity, they girdle the tree and may kill it. Investigations are currently underway to establish feasible and effective biological control measures against this beetle, including the possible introduction of a parasitic wasp from Australia that selectively attacks the larvae of this species. However, at this time, the best control measure against this pest is by providing adequate irrigation to the *Eucalyptus* trees.

3.4 Comparisons of Present and Historical Records of Insect Species on Point Loma

To date, 135 species of Point Loma insects have been identified from historical, literature, and specimen collection sources. 173 species of insects have been identified from the present (1993-1994) insect survey of Navy property on Point Loma. It is of potential interest to make the following comparisons between the historical and current insect species lists: 1) 78 of the historical species records were duplicated by the present survey, 2) 57 historical species records were not duplicated by the present inventory, and 3) 95 species identified during the present inventory are not part of the historical record.

These numbers undoubtedly will change substantially as more species are identified in both categories. BBC cannot suggest at this time that any resident insect species formerly known to occur on Point Loma is now absent. Future concentrated surveys may be able to address this problem.

Table 3-2

**Historical Survey for Sensitive Insects on
Point Loma Navy Property**

List of Species Records

Table 3-2

Historical Survey for Sensitive Insects on Point Loma Navy Property

List of Species Records

Abbreviations:

SDMNH	San Diego Museum of Natural History, Department of Entomology
Guidry	Private collection of Lee Guidry, Point Loma, California
UCR	University of California, Riverside, Entomological Research Museum
UCD	University of California, Davis, Bohart Museum of Entomology
UCB	University of California, Berkeley, Essig Museum of Entomology
CAS	California Academy of Sciences, Department of Entomology, San Francisco
LACM	Los Angeles County Museum of Natural History, Department of Entomology

The first entry for each sensitive insect species is bold-faced

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Order Dermaptera			
Family Forficulidae			
<i>Forficula auricularia</i>	Point Loma	SDMNH	
Family Carcinophoridae			
<i>Euborellia annulipes</i>	Point Loma	SDMNH	
Family Labiduridae			
<i>Labidura riparia</i>	Point Loma	SDMNH	
Order Isoptera			
Family Rhinotermitidae			
<i>Reticulitermes hesperus</i>	Point Loma	SDMNH	
Family Kalotermitidae			
<i>Incisitermes minor</i>	Point Loma	SDMNH	
Order Hemiptera			
Family Miridae			
<i>Engytatus modestus</i>	Point Loma	SDMNH	also in Guidry collection abundant in low sand dunes (Van Duzee, 1914). also in Guidry collection
<i>Plagiognathus verticallis</i>	Ocean Beach	(Literature)	
<i>Rhinacloa forticornis</i>	Point Loma	SDMNH	

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Pentatomidae			
<i>Murgantia histrionica</i>	Point Loma	SDMNH	
Order Homoptera			
Family Cicadidae			
<i>Okanogana vanduzeei</i>	Point Loma	SDMNH	
Order Neuroptera			
Family Chrysopidae			
<i>Chrysoperla sp.</i>	Point Loma	SDMNH	
Family Hemerobiidae			
<i>Micromus sp.</i>	Point Loma	SDMNH	
Order Coleoptera			
Family Cicindelidae			
<i>Cicindela hirticollis gravida</i>	Silver Strand	SDMNH	Federal C2 Candidate species 5 May 1934
<i>C. hirticollis gravida</i>	Border Field	SDMNH	July/August 1982
<i>C. hirticollis gravida</i>	Coronado	CAS	Blaisdell Collection. No date.
<i>C. hirticollis gravida</i>	Silver Strand	CAS	June, 1934
<i>C. hirticollis gravida</i>	"San Diego"	CAS	no other information
<i>C. hirticollis gravida</i>	Silver Strand	CAS	Rump Collection. 5 July, 1946.
<i>C. hirticollis gravida</i>	W. Salt Works, San Diego	UCB	July
<i>C. hirticollis gravida</i>	Oceanside	UCB	August
<i>C. hirticollis gravida</i>	North Island	SDMNH	6 May 1934 and 3 June 1930
<i>Cicindela latesignata</i>	Ocean Beach	CAS	Federal C2 Candidate species. April. Blaisdell Collection
<i>C. latesignata</i>	Sorrento Beach	CAS	June.
<i>C. latesignata</i>	Torrey Pines	CAS	August
<i>C. latesignata</i>	Silver Strand	CAS	August
<i>C. latesignata</i>	Mission Valley	CAS	June. Moore Collection.
<i>C. latesignata</i>	La Jolla	CAS	no date.
<i>C. latesignata</i>	Del Mar	CAS	April
<i>C. latesignata</i>	Silver Strand	CAS	July, 1946. Rump Collection.
<i>C. latesignata</i>	Los Penasquitos Creek, vic. Del Mar	CAS	August, 1956. Rump Collection.
<i>C. latesignata</i>	San Marcos Creek, 4mi. S. Carlsbad	CAS	27 August, 1960. Rump Collection.
<i>C. latesignata</i>	Los Penasquitos Creek, vic. Del Mar	UCD	1 July, 1956.
<i>C. latesignata</i>	Sorrento Beach	UCD	June
<i>C. latesignata</i>	Del Mar	UCB	August
<i>C. latesignata</i>	San Diego Bay	UCB	March
<i>C. latesignata</i>	Border Field	UCB	August
<i>C. latesignata</i>	Mission Bay	UCB	July

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
<i>Cicindela latesignata</i>	Aztec Terrace, San Diego	UCB	January (date questionable)
<i>Cicindela gabbi</i>	Chula Vista	CAS	Federal C2 Candidate species. July, 1954. Rump Collection.
<i>C. gabbi</i>	Tijuana River Estuary	LACM	no date.
Family Chrysomelidae			
<i>Altica foliacea</i>	Point Loma	SDMNH	
<i>Diabrotica balteata</i>	Point Loma	SDMNH	
<i>Diachus auratus</i>	Point Loma	SDMNH	also in Guidry collection
Family Coccinellidae			
<i>Cycloneda munda</i>	Point Loma	SDMNH	
<i>Hippodamia convergens</i>	Point Loma	SDMNH	
<i>Orcus chalybeus</i>	Point Loma	SDMNH	
Family Scarabaeidae			
<i>Dinacoma marginata</i>	Ocean Beach	(Literature)	Ocean Beach is probable type-locality (Blaisdell, 1930). Probable Federal Candidate status in near future.
<i>D. marginata</i>	Del Mar	SDMNH	July 1958
<i>D. marginata</i>	Ocean Beach	CAS	Van Dyke Collection. No date.
<i>D. marginata</i>	Ocean Beach	CAS	Clark Collection. No date.
<i>D. marginata</i>	Ocean Beach	CAS	Ricksecker Collection. No date
<i>D. marginata</i>	"San Diego"	CAS	Blaisdell Collection. 28 June, 1897.
			Probably from Ocean Beach (see text).
<i>Serica sp.</i>	Point Loma	SDMNH	
Family Cerambycidae			
<i>Ipochus fasciculatus</i>	Point Loma	SDMNH	also in Guidry collection
<i>Phoracantha semipunctata</i>	Point Loma	SDMNH	first collected in 1988 (imported <i>Eucalyptus</i> pest)
Family Staphylinidae			
<i>Caftus canescens</i>	Ocean Beach	(Literature)	(Orth, et al, 1980).
<i>C. canescens</i>	Sunset Cliffs	(Literature)	(Orth, et al, 1980).
<i>C. lithocharinus</i>	Sunset Cliffs	(Literature)	(Orth, et al, 1980).
<i>C. lithocharinus</i>	Ocean Beach	(Literature)	(Orth, et al, 1980).
<i>C. luteipennis</i>	Ocean Beach	(Literature)	(Orth, et al, 1980).
<i>C. luteipennis</i>	Sunset Cliffs	(Literature)	(Orth, et al, 1980).
<i>C. semintins</i>	Ocean Beach	(Literature)	(Orth, et al, 1980).
<i>C. sulcicollis</i>	Ocean Beach	(Literature)	(Orth, et al, 1980).
<i>C. semintins</i>	Sunset Cliffs	(Literature)	(Orth, et al, 1980).
<i>Hadrotus crassus</i>	Sunset Cliffs	(Literature)	In decaying seaweed. (Moore, 1964).

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Tenebrionidae			
<i>Eleodes omissus</i>	Point Loma	SDMNH	
<i>E. nigropilosus</i>	Point Loma	SDMNH	
<i>Helops confluens</i>	Point Loma	SDMNH	
Tenebrionidae species	Ballast Point, Point Loma	Archeological Survey, Point Loma	
Family Mordellidae			
<i>Mordella</i> sp.	Point Loma	SDMNH	also in Guidry collection
Order Lepidoptera			
Family Hesperiidae			
<i>Agathymus comstocki</i>	Point Loma (?)	(Literature)	possible former resident, now believed extinct in U.S. Hostplant, <i>Agave shawii</i> (Emmel & Emmel, 1973).
<i>Erynnis funeralis</i>	Point Loma	Guidry	
<i>Erynnis tristis</i>	Point Loma	Guidry	
<i>Hylephila phyleus</i>	Point Loma	UCR	
<i>Lerodia eufala</i>	Point Loma	Guidry	
<i>Panoquina errans</i>	Imperial Beach	SDMNH	Federal C2 Candidate species
<i>Panoquina errans</i>	National City	SDMNH	
<i>Panoquina errans</i>	Coronado	SDMNH	
<i>Paratrytone melane</i>	Point Loma	SDMNH	
<i>Polites sabuleti</i>	Point Loma	SDMNH	
<i>Polygonus leo</i>	Point Loma	Guidry	Sight record only
<i>Pyrgus albescens</i>	Point Loma	Guidry	
<i>Pyrgus scriptura</i>	Point Loma	Guidry	
<i>Urbanus proteus</i>	Point Loma	Guidry	Possible Mexican stray
Family Papilionidae			
<i>Battus philenor</i>	Point Loma	SDMNH	Mexican stray collected 1924
<i>Papilio cresphontes</i>	Point Loma	Guidry	Possible Mexican stray
<i>Papilio eurymedon</i>	Point Loma	SDMNH	
<i>Papilio zelicaon</i>	Point Loma	SDMNH	
<i>Papilio zelicaon</i>	Point Loma	Guidry	Reared ex ova on <i>Foeniculum vulgare</i>
Family Pieridae			
<i>Eurema nicippe</i>	Point Loma	SDMNH	Guidry, ex larva on <i>Cassia</i> sp.
<i>Nathalis iole</i>	Point Loma	Guidry	
<i>Phoebis sennae</i>	Point Loma	SDMNH	Guidry, ex larva on <i>Cassia</i> sp.
<i>Pieris protodice</i>	Point Loma	Guidry	
<i>Pieris rapae</i>	Point Loma	Guidry	
Family Danaidae			
<i>Danaus plexippus</i>	Point Loma	SDMNH	Migrant; hostplant (<i>Asclepias</i> sp.) not present

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Lycaenidae			
<i>Brephidium exilis</i>	Point Loma	SDMNH	Also in Guidry collection
<i>Euphilotes battoides</i> <i>bernardino</i>	Point Loma	Guidry	
<i>Leptotes marina</i>	Point Loma	SDMNH	
<i>Philotes sonorensis</i>	Point Loma	SDMNH	
<i>Strymon melinus</i>	Point Loma	SDMNH	
Family Nymphalidae			
<i>Agraulis vanillae</i>	Point Loma	SDMNH	Also in Guidry collection
<i>Nymphalis antiopa</i>	Point Loma	SDMNH	Also in Guidry collection
<i>Precis coenia</i>	Point Loma	SDMNH	
<i>Vanessa annabella</i>	Point Loma	SDMNH	All 4 species of <i>Vanessa</i> represented in the Guidry collection also.
<i>Vanessa atalanta</i>	Point Loma	SDMNH	
<i>Vanessa cardui</i>	Point Loma	SDMNH	
<i>Vanessa virginiensis</i>	Point Loma	SDMNH	
Family Sphingidae			
<i>Aellopus clavipes</i>	Point Loma	Guidry	Mexican stray; state record
<i>Agrius cingulata</i>	Point Loma	Guidry	Possible Mexican stray
<i>Erinnyis ello</i>	Point Loma	SDMNH	Also in Guidry collection; possible Mexican stray
<i>Eumorpha achemon</i>	Point Loma	Guidry	
<i>Hyles lineata</i>	Point Loma	Guidry	
<i>Manduca</i> <i>quinquemaculata</i>	Point Loma	Guidry	Ex larva on Tomato
<i>M. sexta</i>	Point Loma	Guidry	Ex larva on Tomato
<i>Pachysphinx</i> <i>occidentalis</i>	Coronado	SDMNH	
<i>Smerinthus cerisyi</i>	Point Loma	SDMNH	Also in Guidry collection
Family Arctiidae			
<i>Apantesis proxima</i>	Point Loma	SDMNH	
<i>Estigmene acraea</i>	Point Loma	Guidry	
Family Diopitidae			
<i>Phryganidia</i> <i>californica</i>	Point Loma	SDMNH	reared ex larva on <i>Quercus agrifolia</i>
Family Pyralidae			
<i>Jocara trabalis</i>	Point Loma	UCR	
<i>Pyrausta depalis</i>	Point Loma	UCR	
<i>Uresiphita reversalis</i>	Point Loma	SDMNH	Reared on Scotch Broom
<i>Vitula edmondsae</i>	Point Loma	SDMNH	Ex <i>Bombus</i> sp. nest, on pollen
Family Geometridae			
<i>Camptogramma</i> <i>neomexicana</i>	Point Loma	UCR	
<i>Euphyia implicata</i>	Point Loma	UCR	
<i>Sabulodes caberata</i>	Point Loma	SDMNH	

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Lasiocampidae			
<i>Gloveria medusa</i>	Point Loma	Guidry	Ex larva on <i>Eriogonum fasciculatum</i>
<i>G. medusa</i>	Point Loma	SDMNH	
Family Noctuidae			
<i>Agrotis ipsilon</i>	Point Loma	SDMNH	
<i>Apamea cenefacta</i>	Point Loma	UCR	
<i>Ascalapha odorata</i>	Point Loma	UCR	Also in Guidry collection; possible Mexican stray
<i>Autographa biloba</i>	Point Loma	SDMNH	
<i>Autographa californica</i>	Point Loma	SDMNH	
<i>Euacontia semirufa</i>	Point Loma	UCR	
Noctuid species	Point Loma	UCR	
<i>Peridroma saucia</i>	Point Loma	UCR	
<i>Pseudaletia unipuncta</i>	Point Loma	SDMNH	also at UCR
<i>Trichoplusia ni</i>	Point Loma	UCR	
Order Diptera			
Family Stratiomyidae			
<i>Hermetia illucens</i>	Point Loma	SDMNH	
Family Asilidae			
<i>Cophura vanduzeei</i>	Point Loma	SDMNH	also in Guidry collection
<i>Proctacanthus coquillettii</i>	Ballast Point, Point Loma	Archeological Survey, Point Loma	
Family Mydidae			
<i>Pseudonomoneura hirta</i>	Point Loma	SDMNH	also in Guidry collection
Family Tephritidae			
<i>Neotephritia finalis</i>	Point Loma	SDMNH	also in Guidry collection
<i>Trupanea bisetosa</i>	Point Loma	SDMNH	or <i>T. nigricornis</i>
<i>T. wheeleri</i>	Point Loma	SDMNH	also in Guidry collection
Family Platystomatidae			
<i>Pogonartalis doclea</i>	Point Loma	SDMNH	also in Guidry collection
Family Conopidae			
<i>Phyocephala texana</i>	Point Loma	SDMNH	also in Guidry collection. Parasite, ex: workers of <i>Bombus sonorus</i> (Hymenoptera: Apidae).
Family Bombyliidae			
<i>Bombylius sp.</i>	Point Loma	SDMNH	also in Guidry collection
<i>Hemipenthes sp.</i>	Point Loma	SDMNH	
<i>Heterostylum sp.</i>	Point Loma	SDMNH	
<i>Villa sp.</i>	Point Loma	SDMNH	

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Tachinidae			
<i>Archytas apicifer</i>	Point Loma	SDMNH	
Family Muscidae			
Muscidae species	Point Loma	SDMNH	
Family Anthomyiidae			
Anthomyiid species	Point Loma	SDMNH	
Family Empididae			
Empididae species	Point Loma	SDMNH	
Family Drosophilidae			
Drosophilidae sp.	Point Loma	SDMNH	
Family Psychodidae			
<i>Clogmia albipunctata</i>	Point Loma	SDMNH	
Family Calliphoridae			
<i>Cochliomyia macellaria</i>	Point Loma	SDMNH	
<i>Phaenicia sericata</i>	Point Loma	SDMNH	
Family Rhagionidae			
Rhagionidae species	Point Loma	SDMNH	
Family Scatopsidae			
Scatopsidae species	Point Loma	SDMNH	
Family Cecidomyiidae			
Cecidomyiidae species	Point Loma	SDMNH	
Order Hymenoptera			
Family Formicidae			
<i>Darymyrmese pyramiens</i>	Point Loma	(Literature)	(Leonard, 1911)
<i>Eciton sumichrasti</i>	Point Loma	(Literature)	(Leonard, 1911)
<i>Myrmecocystus mimicus</i>	Point Loma	(Literature)	(Leonard, 1911, Snelling, 1976). Collects nectar from flowers of <i>Mesembryanthemum aequilaterale</i>
<i>M. testaceous</i>	Point Loma	(Literature)	Leonard, 1911, Honey Ant Survey. Current taxonomy by Snelling, 1976.
Family Braconidae			
Braconidae species	Point Loma	SDMNH	many species, undetermined

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Aphidiidae			
<i>Ephedrus sp.</i>	Point Loma	SDMNH	
Family Tenthredinidae			
<i>Cladius difformis</i>	Point Loma	SDMNH	ex larva on Rose
Family Ichneumonidae			
<i>Compsocryptus sp.</i>	Point Loma	SDMNH	
<i>Horogenes sp.</i>	Point Loma	SDMNH	
<i>Trachyspherus sp.</i>	Point Loma	SDMNH	
Family Scelionidae			
Scelionidae sp.	Point Loma	SDMNH	ex: <i>Murgantia histrionica</i> (Hemiptera: Pentatomidae)
Family Platygasteridae			
<i>Amitus sp.</i>	Point Loma	SDMNH	ex Aleyrodidae sp. (Homoptera) on <i>Citrus</i>
Family Mutillidae			
<i>Dasymutilla californica</i>	Point Loma	SDMNH	
Family Colletidae			
<i>Hylaeus sp.</i>	Point Loma	SDMNH	
Family Apidae			
<i>Bombus sonorus</i>	Point Loma	SDMNH	also in Guidry collection.
Family Sphecidae			
<i>Bembix americana</i>	Point Loma	SDMNH	
<i>B. comata</i>	Point Loma	SDMNH	
<i>Bicyrtes ventralis</i>	Point Loma	SDMNH	
<i>Gorytes phaleratus</i>	Point Loma	SDMNH	
<i>Larropsis tenuicornis</i>	Point Loma	SDMNH	
<i>Mimesa punctifrons</i>	Point Loma	SDMNH	
<i>Oxybelus uniglumis</i>	Point Loma	SDMNH	
<i>Podalonia occidentalis</i>	Point Loma	SDMNH	
<i>P. argentifrons</i>	Point Loma	SDMNH	
<i>Psammaecius sp.</i>	Point Loma	SDMNH	
<i>Sphex lucae</i>	Point Loma	SDMNH	
<i>S. ichneumonius</i>	Point Loma	SDMNH	
<i>Tachysphex amplus</i>	Point Loma	SDMNH	
<i>T. apicalis</i>	Point Loma	SDMNH	
<i>T. texanus</i>	Point Loma	SDMNH	
Family Vespidae			
<i>Ancistrocerus sp.</i>	Point Loma	SDMNH	
<i>Vespula pensylvanica</i>	Point Loma	SDMNH	

<u>Species</u>	<u>Locality</u>	<u>Collection</u>	<u>Comments</u>
Family Pompilidae			
<i>Anoplius nigrinus</i>	Point Loma	SDMNH	
<i>A. toluca</i>	Point Loma	SDMNH	
<i>Aporinellus basalis</i>	Point Loma	SDMNH	
<i>A. completus</i>	Point Loma	SDMNH	
<i>A. medianus</i>	Point Loma	SDMNH	
<i>A. taeniatus</i>	Point Loma	SDMNH	
<i>A. yucatanensis</i>	Point Loma	SDMNH	
<i>Aporus luxus</i>	Point Loma	SDMNH	
<i>A. hirsutus</i>	Point Loma	SDMNH	

Table 3-3

**Sensitive Insect Survey of
Point Loma Navy Property**

Current Insect Inventory (1993-1994)

Table 3-3

Sensitive Insect Survey of Point Loma Navy Property

Current Insect Inventory (1993-1994)

Insect orders and families are presented phylogenetically according to Borror, Triplehorn and Johnson (1989). Genera and species are listed alphabetically. Common names are provided where possible.

- **Order Collembola (Springtails)**

Isotomidae

Isotoma sp.

- **Order Thysanura (Silverfish)**

Lepismatidae

Lepisma saccharina

- **Order Microcoryphia (Bristletails)**

Machilidae

Machilinus sp.

- **Order Ephemeroptera (Mayflies)**

Baetidae

- **Order Odonata (Dragonflies and Damselflies)**

Dragonflies

Aeshnidae (Darners)

Anax junius (Multicolored Darner)

Aeshna multicolor (Common Green Darner)

Libellulidae (Skimmers)

Libellula croceipennis

Libellula saturata (Big Red Skimmer)

Pachydiplax longipennis

Sympetrum corruptum (Pastel Skimmer)

Tramea lascerata

Damselflies

Coenagrionidae (Dancers)

Argia sp.

Enallagma sp.

Ischnura sp.

- **Order Orthoptera (Grasshoppers, Mantids, Roaches, etc.)**

Grasshoppers

Acrididae

Melanoplus sp.

Schistocerca nitens (Gray Bird Grasshopper)

Trimarotropis sp.

Katydids

Tettigoniidae

Scudderia mexicana (Fork-tailed Bush Katydid)

Crickets

Gryllidae

Acheta domesticus (European House Cricket)

Gryllus sp. (Field Crickets)

Oecanthus sp. (Tree Crickets)

Praying Mantids

Mantidae

Iris oratoria (European Mantis)

Stagmomantis californica (California Mantis)

Roaches

Blattellidae

Blattella vaga (Field Roach)

Blattella germanica (German Cockroach)

Blattidae

Blatta orientalis (Oriental Cockroach)

Periplaneta americana (American Cockroach)

• **Order Dermaptera (Earwigs)**

Forficulidae

Forficula auricularia (European Earwig)

Carcinophoridae

Euborellia annulipes (Ring-legged Earwig)

Labiduridae

Labidura riparia

• **Order Isoptera (Termites)**

Termitidae

Amitermes wheeleri

Kalotermitidae

Incisitermes minor (Western Drywood Termite)

Rhinotermitidae

Reticulitermes hesperus (Western Subterranean Termite)

• **Order Embioptera (Webspinners)**

Oligotomidae

• **Order Psocoptera (Psocids and Lice)**

Liposcelidae

• **Order Mallophaga (Bird Lice)**

- **Order Thysanoptera (Thrips)**

- Thripidae

- Frankliniella occidentalis* (Western Flower Thrips)

- **Order Hemiptera (True Bugs)**

- Pentatomidae (Stink Bugs)

- Brochymena* sp.

- Chlorochroa sayi* (Say's Stink Bug)

- Murgantia histrionica* (Harlequin Bug)

- Thyanta* sp.

- Thyreocoridae (Negro Bugs)

- Corimelaena* sp.

- Cydnidae (Burrower Bugs)

- Pangaeus* sp.

- Coreidae (Leaf-footed Bugs)

- Anasa tristis* (Squash Bug)

- Leptoglossus* sp. (Leaf-legged Bugs)

- Rhopalidae (Scentless Plant Bugs)

- Arhyssus* sp.

- Lygaeidae (Seed Bugs)

- Geocoris* sp. (Big-headed Bugs)

- Lygaeus kalmii* (Milkweed Bug)

- Nyssius raphanus* (False Chinch Bug)

- Largidae (Largid Bugs)

- Largus cinctus* (Bordered Plant Bug)

- Tingidae (Lace Bugs)

- Reduviidae (Assassin Bugs)

- Apiomerus crassipes* (Bee Assassin)

- Zelus* sp.

- Anthocoridae (Minute Pirate Bugs)

- Miridae (Plant Bugs)

- Lygus* sp.

- Rhinacloa* sp.

- **Order Homoptera (Cicadas, Hoppers, Aphids, etc.)**

- Cicadidae (Cicadas)

- Okanogana vanduzeei* (Van Duzee's Cicada)

- Membracidae (Treehoppers)

- Cercopidae (Froghoppers)

- Aphrophoridae (Spittlebugs)

- Aphrophora* sp.

- Cicadellidae (Leafhoppers)

- Homalodisca lacerta* (Smoke Tree Leafhopper)

- Flatidae (Flat Planthoppers)

- Psyllidae (Jumping Plant Lice)

- Aleyrodidae (Whiteflies)

- Aphididae (Aphids)

- Microsiphum rosae* (Rose Aphid)

Margarodidae (Cottony-cushion Scales)

Icerya purchasi (Cottony-cushion)

Coccidae (Soft Scales)

Diaspididae (Armored Scales)

Aonidiella aurantii (California Red Scale)

Pseudococcidae (Mealybugs)

Pseudococcus sp.

• Order Neuroptera (Lacewings, Antlions, etc.)

Chrysopidae (Green Lacewings)

Chrysoperla sp.

Hemerobiidae (Brown Lacewings)

Hemerobius sp.

Micromus sp.

Myrmeleontidae (Ant Lions)

Brachynemurus sp.

• Order Coleoptera (Beetles)

Carabidae (Ground Beetles)

Calosoma semilaeve

Calathus ruficollis

Tanystoma maculicolle

Staphylinidae (Rove Beetles)

Cafius sp.

Scarabaeidae (Scarab Beetles)

Cotinus mutibilis (Green June Beetle)

Cyclocephala sp. (May Beetles)

Diplotaxis sp.

Serica sp.

Elateridae (Click Beetles)

Conoderus exsul

Cantharidae (Soldier Beetles)

Dermestidae (Carpet Beetles)

Anthrenus sp.

Bostrichidae (Twig Borers)

Lyctidae (Powder-Post Beetles)

Melyridae (Soft-winged Flower Beetles)

Coccinellidae (Ladybird Beetles)

Chilocorus orbus (Two-stabbed Ladybird)

Coccinella californica (California Ladybird)

Cycloneda munda

Hippodamia convergens (Convergent Ladybird)

Olla v-nigrum (Ashy Gray Ladybird)

Tenebrionidae (Darkling Beetles)

Cratidus osculans

Eleodes nigropilosis

Eleodes omissus

Eleodes sp.

Helops confluens

Zopheridae (Ironclad Beetles)

Phloeodes pustulosus

Mordellidae (Tumbling Flower Beetles)

Mordella sp.

Cerambycidae (Longhorn Beetles)

Ipochnus fasciculatus

Lepturinae sp.

Phoracantha semipunctata (Eucalyptus Longhorn Borer)

Bruchidae (Seed Beetles)

Acanthoscelides limbatus

Chrysomelidae (Leaf Beetles)

Altica foliacea

Coscinoptera sp.

Diabrotica balteata

Diabrotica undecimpunctata (Spotted Cucumber Beetle)

Diachus auratus

Lema trilineata

Microrhopala rubrolineata

Saxinus saucia

Trirhabda sp.

Curculionidae (Weevils)

Asynonychus godmanni (Fuller's Rose Weevil)

Listroderes sp. (Vegetable Weevils)

Scolytidae (Bark Beetles)

• Order Lepidoptera (Butterflies and Moths)

Butterflies

Hesperiidae (Skippers)

Apatelodes campestris (Field Skipper)

Erynnis funeralis (Funeral Duskywing)

Erynnis tristis (Mournful Duskywing)

Heliopetes ericetorum (Large White Skipper)

Hylephila phyleus (Fiery Skipper)

Lerodea eufala (Eufala Skipper)

Ochlodes sylvanoides (Woodland Skipper)

Panoquina errans (Wandering Skipper) Federal C2 Candidate Species

Paratrytone melane (Umber Skipper)

Polites sabuleti (Sandhill Skipper)

Pyrgus albescens (Western Checkered Skipper)

Papilionidae (Swallowtail Butterflies)

Papilio cressphontes (Giant Swallowtail)

Papilio rutulus (Tiger Swallowtail)

Papilio zelicaon (Anise Swallowtail)

Pieridae (Whites and Sulfurs)

Colias eurytheme (Alfalfa Sulfur)

Eurema nicippe (Nicippe Yellow)

Nathalis iole (Dainty Dwarf)

Phoebis sennae marcellina (Senna Sulfur)

Pieris protodice (Checkered White)

Pieris rapae (European Cabbage White)

Lycaenidae (Blues & Hairstreaks)

- Brephidium exilis* (Pygmy Blue)
- Callophrys dumetorum* (Bramble Hairstreak)
- Euphilotes battoides bernardino* (Bernardino Blue)
- Everes amyntula* (Western Tailed Blue)
- Glaucopteryx lygdamus australis* (Southern Blue)
- Incisalia augustinus iroides* (Western Elfin)
- Leptotes marina* (Marine Blue)
- Plebejus acmon* (Acmon Blue)
- Strymon melinus pudica* (Common Hairstreak)

Riodinidae (Metalmark Butterflies)

- Apodemia mormo virgulti* (Mormon Metalmark)

Nymphalidae (Brush-footed Butterflies)

- Agraulis vanillae incarnata* (Gulf Fritillary)
- Nymphalis antiopa* (Mourning-Cloak)
- Precis coenia* (Buckeye)
- Vanessa annabella* (West Coast Lady)
- Vanessa atalanta* (Red Admiral)
- Vanessa cardui* (Painted Lady)
- Vanessa virginiensis* (Virginia Lady)

Danaidae (Milkweed Butterflies)

- Danaus plexippus* (Monarch)

Moths

Gelechiidae (Gelechiid Moths)

Tortricidae (Tortricid Moths)

- Amorbia cuneana*

Pterophoridae (Plume Moths)

Pyralidae (Pyralid Moths)

- Amyelois transitella* (Navel Orange Worm)
- Jocara trabalis*
- Plodia interpunctella* (Indian Meal Moth)
- Pyralis farinalis* (Meal Moth)
- Pyrausta depalis*
- Uresiphita reversalis* (Genista Moth)

Geometridae (Measuring Worm Moths)

- Camptogramma neomexicana*
- Drepanulatrix* sp.
- Euphyia implicata*
- Eupithecia* sp.
- Itame* sp.
- Pero macdunnoughi* (MacDunnough's Pero)
- Platea californica*
- Sabulodes aegrotata* (Omnivorous Looper)
- Semiothisa* sp.
- Stamnodes* sp.

Lasiocampidae (Lappet Moths & Tent Caterpillars)

- Gloveria medusa* (Medusa Moth)

Saturniidae (Giant Silk Moths)

- Hemileuca electra electra* (Electra Buckmoth)

Sphingidae (Sphinx Moths)

- Hyles lineata* (White-lined Sphinx)
- Manduca sexta* (Tobacco Hornworm)

Lymantriidae (Tussock Moths)

- Orgyia cana* (Western Tussock Moth)

Arctiidae (Tiger Moths)

- Apantesis proxima* (Mexican Tiger Moth)
- Arachnis picta* (Painted Arachnis)

Noctuidae (Owlet Moths)

- Agrotis ipsilon* (Black Cutworm)
- Agrotis subterranea* (Granulate Cutworm)
- Apamea cenefacta*
- Autographa biloba* (Chocolate Looper)
- Autographa californica* (Alfalfa Looper)
- Euacontia semirufa*
- Helicoverpa zea* (Corn Earworm)
- Heliothis virescens*
- Hemeroplanis finitima*
- Orthodes sp.*
- Peridroma saucia* (Variegated Cutworm)
- Pseudaletia unipuncta* (Armyworm)
- Spodoptera exigua* (Beet Armyworm)
- Spodoptera ornithogalli* (Yellow-striped Armyworm)
- Trichoplusia ni* (Cabbage Looper)
- Zale lunata* (Moon Umber)

• Order Diptera (Flies)

Tipulidae (Crane Flies)

- Tipula planicornis* (Common Crane Fly)

Psychodidae (Moth Flies)

- Clogmia albipunctata* (Bathroom Fly)

Culicidae (Mosquitos)

Chironomidae (Water Midges)

Bibionidae (March Flies)

Stratiomyidae (Soldier Flies)

- Hermetia illucens* (Window Fly)

Tabanidae (Deer Flies)

- Tabanus punctifer* (Big Black Horse Fly)

Mydidae (Mydas Flies)

- Pseudonomoneura hirta*

Asilidae (Robber Flies)

- Cophura vanduzeei*
- Mallophora faurix* (Bumblebee Robber Fly)
- Proctacanthus coquillettii*

Bombyliidae (Bee Flies)

- Bombylius sp.*
- Conophorus sp.*
- Heterostylum sp.*
- Villa sp.*

Dolichopodidae (Long-legged Flies)

Phoridae (Humpbacked Flies)
Syrphidae (Flower Flies)
 Copestylum mexicana (Cactus Fly)
 Eristalis tenax (Drone Fly)
Conopidae (Thick-headed Flies)
 Physocephala texana (Bumble Bee Conopid)
Platystomatidae (Picture-winged Flies)
 Pogonartalis doclea
Tephritidae (Fruit Flies)
 Trupanea sp.
Coelopidae (Seaweed Flies)
 Coelopa sp.
Ephydriidae (Shore Flies)
Drosophilidae (Pomace Flies)
 Drosophila melanogaster (Vinegar Fly)
 Drosophila sp.
Chloropidae (Chloropid Flies)
Agromyzidae (Leaf-miner Flies)
Anthomyiidae (Anthomyiid Flies)
 Fucellia sp. (Beach Flies)
Muscidae (Muscid Flies)
 Musca domestica (House Fly)
 Stomoxys calcitrans (Stable Fly)
Calliphoridae (Blow Flies)
 Calliphora sp. (Blue Bottle Flies)
 Phaenicia sericata (Green Bottle Fly)
 Cochliomyia macellaria (Blow Fly)
Sarcophagidae (Flesh Flies)
Tachinidae (Tachinid Flies)
 Archytas apicifer

- Order **Siphonaptera** (Fleas)

- Order **Hymenoptera** (Bees, Wasps and Ants)

Tenthredinidae (Sawflies)
Braconidae (Braconid Wasps)
Aphidiidae (Aphid Wasps)
 Aphidius sp.
Ichneumonidae (Ichneumonid Wasps)
 Horogenes sp.
 Ophion sp.
Trichogrammatidae (Trichogrammatid Wasps)
 Paracentrobia sp.
 Trichogramma sp.
Eulophidae (Eulophid Wasps)
Encyrtidae (Encyrtid Wasps)
Pteromalidae (Pteromalid Wasps)
Cynipidae (Gall Wasps)

Scelionidae (Scelionid Wasps)

Platygasteridae (Platygasterid Wasps)

Chrysididae (Cuckoo Wasps)

Formicidae (Ants)

Camponotus sp.

Formica sp.

Iridomyrmex humilis

Liometopum occidentalae

Pogonomyrmex californicus

Pseudomyrmex apache

Solenopsis molesta

Solenopsis xyloni

Tiphiidae (Tiphiid Wasps)

Brachycistis sp.

Mutillidae (Velvet Ants)

Chyphotes sp.

Dasymutilla californica (California Velvet Ant)

Sphaerophthalma sp.

Pompilidae (Spider Wasps)

Anoplius sp.

Aporinellus sp.

Aporus sp.

Pepsis sp.

Vespidae (Paper Wasps, Yellowjackets, etc.)

Ancistrocerus sp.

Polistes dorsalis (Western Paper Wasp)

Polistes fuscatus (Golden Paper Wasp)

Vespula pensylvanica (Yellowjacket)

Sphecidae (Sphecid Wasps)

Ammophila sp. (Thread-waisted Wasps)

Bembix americana (American Sand Wasp)

Bembix comata (Sand Wasp)

Chalybion californicum (Blue Mud Wasp)

Chlorion aerarium (Large Blue Mud Dauber)

Podalonia argentifrons

Podalonia sp.

Prionyx sp.

Psammaecius sp.

Sceliphron caementarium (Mud Dauber)

Sphex ichneumoneus

Tachysphex sp.

Colletidae (Colletid Bees)

Colletes sp. (Plasterer Bees)

Hylaeus sp. (Yellow-faced Bees)

Halictidae (Halictid Bees)

Agapostemon sp. (Metallic Sweat Bees)

Dialictus sp.

Dufourea sp.

Halictus sp.

Lasioglossum sp.

Andrenidae (Andrenid Bees)

Andrena sp.

Megachilidae (Leafcutting Bees)

Anthidium sp.

Chalicodoma sp.

Megachile sp.

Osmia sp.

Anthophoridae (Cuckoo, Digger and Carpenter Bees)

Anthophora sp. (Digger Bees)

Diadasia sp.

Melissodes sp.

Xylocopa varipuncta (Valley Carpenter Bee)

Apidae (Bumble Bees and Honey Bees)

Apis mellifera (Honey Bee)

Bombus californicus (California Bumble Bee)

Bombus edwardsii (Edward's Bumble Bee)

Bombus sonorinus (Sonoran Bumble Bee)

Bombus vosnesenskii (Vosnesenski's Bumble Bee)

Table 3-4

Non-Resident Insects Recorded From Point Loma

Table 3-4
Non-Resident Insects Recorded From Point Loma

Scientific Name	Common Name	Family	Collection Information	Comments
<i>Ascalapha odorata</i>	Black Witch Moth	Noctuidae	Point Loma, L. Guidry	Common Mexican stray; may occasionally become established on <i>Acacia</i> species
<i>Aellopos clavipes</i>	Clavipes Day Sphinx Moth	Sphingidae	Point Loma, L. Guidry	Mexican stray; State record
<i>Erinyis ello</i>	Ello Sphinx Moth	Sphingidae	Point Loma; SDMNH	possible Mexican stray
<i>Agrius cingulatus</i>	Pink-spotted Hawkmoth	Sphingidae	Point Loma; L. Guidry	possible Mexican stray
<i>Eumorphia achemon</i>	Achemon Sphinx Moth	Sphingidae	Point Loma; L. Guidry	Uncommon in southern California. Occasional stray on Point Loma.
<i>Papilio cresphontes</i>	Giant Swallowtail	Papilionidae	Point Loma; L. Guidry (observed during present survey)	Stray; can become temporarily established on <i>Citrus</i> during years with mild winter temperatures
<i>Battus philenor</i>	Pipevine Swallowtail	Papilionidae	Point Loma; 1924, SDMNH	Mexican stray; Cannot become established in San Diego County (hostplant, <i>Aristolochia</i> sp., not native to the area).
<i>Polygonus leo</i>	Skinner's Arizona Skipper	Hesperiidae	Point Loma; L. Guidry	sight record on Point Loma; other San Diego County records exist

Table 3-4 (Continued)
Non-Resident Insects Recorded From Point Loma

Scientific Name	Common Name	Family	Collection Information	Comments
<i>Urbanus proteus</i>	Long-tailed Skipper	Hesperiidae	Point Loma; L. Guidry	Mexican stray; may occasionally become established on cultivated beans (<i>Phaseolus</i> sp.).
<i>Phoebis sennae</i>	Senna Sulfur	Pieridae	Point Loma; L. Guidry (observed during present survey)	Common Mexican stray; becomes temporarily established on ornamental <i>Cassia</i> species.
<i>Nathalis iole</i>	Dainty Dwarf	Pieridae	Point Loma; numerous records (collected during present survey)	Common non-native butterfly.
<i>Eurema nicippe</i>	Nicippe Yellow	Pieridae	Point Loma; numerous records (collected during present survey)	Common non-native butterfly. Becomes temporarily established on ornamental <i>Cassia</i> species.
<i>Danaus plexippus</i>	Monarch Butterfly	Danaidae	Point Loma; SDMNH (observed during present survey)	Migratory species; may overwinter on Navy lands.
Order Odonata	Dragonfly species	Libellulidae Aeschniidae	Point Loma; numerous records	some species may in fact be migrants from adjacent locations in San Diego

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APPENDIX A

DFARS 52.227-7036 CERTIFICATION OF TECHNICAL DATA CONFORMITY

1)

In compliance with the rules set forth in the Contract/Purchase Order No. N66001-93-M-4908, page 2, of the above referenced section, the following written certification is provided for the Sensitive Insect Survey, completed by Bruyeya Biological Consulting:

The contractor, Bruyeya Biological Consulting, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N66001-93-M-4908 is complete, accurate and complies with all requirements of the contract.

Date: October 30, 1994

Name and Title of Certifying Official: Guy P. Bruyeya, Owner, Bruyeya Biological Consulting

2)

In compliance with the rules set forth in the Contract/Purchase Order No. N66001-93-M-5015, page 2, of the above referenced section, the following written certification is provided for the Historical Survey for Sensitive Insects on Point Loma, Ca., completed by Martin M. Barnes:

The contractor, Martin M. Barnes, hereby certifies that, to the best of its knowledge and belief, the technical data delivered herewith under Contract No. N66001-93-M-5015 is complete, accurate and complies with all requirements of the contract.

Date: October 30, 1994

Name and Title of Certifying Official: Martin M. Barnes, Entomological Consultant

REPORT DOCUMENTATION PAGE

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