MAMMALS OF THE PLAYA VISTA AREA - ENVIRONMENTAL SETTING

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October 1996

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1.0 INTRODUCTION

The background, methods, and results of a multiple-task mammal investigation conducted at the Playa Vista Project site (Project site) are described in this report. Sampling methods included an extensive review of pertinent literature and accession of museum scientific collections of mammals, as well as discussions with mammalogist and agencies familiar with the mammal community of the region in general and on the Project site specifically. Sherman live-trapping and pitfall trapping programs were conducted to define the affected environment, evaluate the presence/absence of a federally Endangered pocket mouse and other sensitive small mammal species, as well as to characterize the small mammal community of the Project site. Additional mammal sampling methods included the use of scent stations, track stations, infrared camera stations, and spotlight surveys to evaluate the presence/absence of a sensitive jackrabbit and to characterize the medium-sized mammal community at the Project site. Moreover, a hand-held bat detector was used to listen for the high frequency echo location and other signals emitted by bats during foraging. These sampling programs were collectively employed to evaluate the entire mammal community present at the Project site.

2.0 BACKGROUND

2.1 Historical/Ecological Perspective

Habitats present at the Project site are suitable to support a variety of mammal species, including several special-status species. Habitat values relative to mammals vary from low to high quality depending upon habitat type, level of disturbance, amount of contiguous habitat (in acres), and individual species' requirements. The general habitat conditions present on each of the Project site's four parcels are described below.

Area A: Elevations on Area A range from 9.3 to 17.4+ feet above mean sea level (MSL), and consists primarily of areas filled during excavations of the Ballona Creek channel in the early 1930s and Marina del Rey in the early 1960s. Generally, the area drains internally as the margins are higher in elevation than the central flats. Area A supports a variety of upland plant species primarily in a ruderal association, pickleweed stands, salt flats, upland/pickleweed transitional habitats, and mule fat/coyote brush scrub.

Area B: Elevations on Area B range from 2.4 to 5.0 feet above MSL in the lower flats, and extend to 50 feet above MSL along the lower slopes of the Del Rey Bluffs. The flats contain the remnants of a tidal salt marsh, and degraded sandy and sand dune habitats. Bluff areas contain various degrees of disturbed upland habitats including degraded coastal sage scrub. Area B is also characterized by pickleweed stands, salt flats, brackishwater marsh areas, and old agricultural fields.

Area C: Area C contains fill from development of the Ballona Creek Channel, Marina del Rey, berms for the long-abandoned Pacific Electric Railroad (Red Line) trolley system, and the Marina (90) Freeway. Spoil material was also deposited as a result of the raising of Culver Boulevard where it crosses Lincoln. Elevations range from 4.6 to 25.6 feet above MSL. Area C is comprised primarily of upland vegetation including non-native annual grassland, coyote brush scrub, and various herbaceous plant species in a ruderal association.

Area D: The east and west ends of Area D are within the boundaries of the previously CEQA certified First Phase Playa Vista Property. As such, the portion of Area D considered in this report consists of 241.3 acres located in the middle of the parcel. This area has been converted to an industrial site, and Area D has been extensively disturbed through farming, the importation of fill, and construction of buildings and runway facilities. The hydrology, topography and biota have been altered as a result of these activities as well as the improvements to Centinela Creek into the Centinela Ditch. The bluffs along the southern edge of Area D contain replaced and remnant natural vegetation, including degraded coastal sage scrub, with elevations ranging up to about 160 feet above MSL.

2.2 Previous Mammal Studies

Mammals of the Project site have been relatively well studied, through both focused field investigations conducted in support of previous environmental documents, as well as through extraneous scientific research conducted by students or professional mammalogists. In addition, professional mammalogists have been involved in active management efforts at the Project site during the past five years. These previous biological efforts were accessed and reviewed to identify 'gaps' in knowledge of the mammal fauna of the Project site, and are briefly summarized below. Where specifically available, locations of previous small mammal trapping studies conducted at the Project site are shown on **Figure 1 on Page 3**.

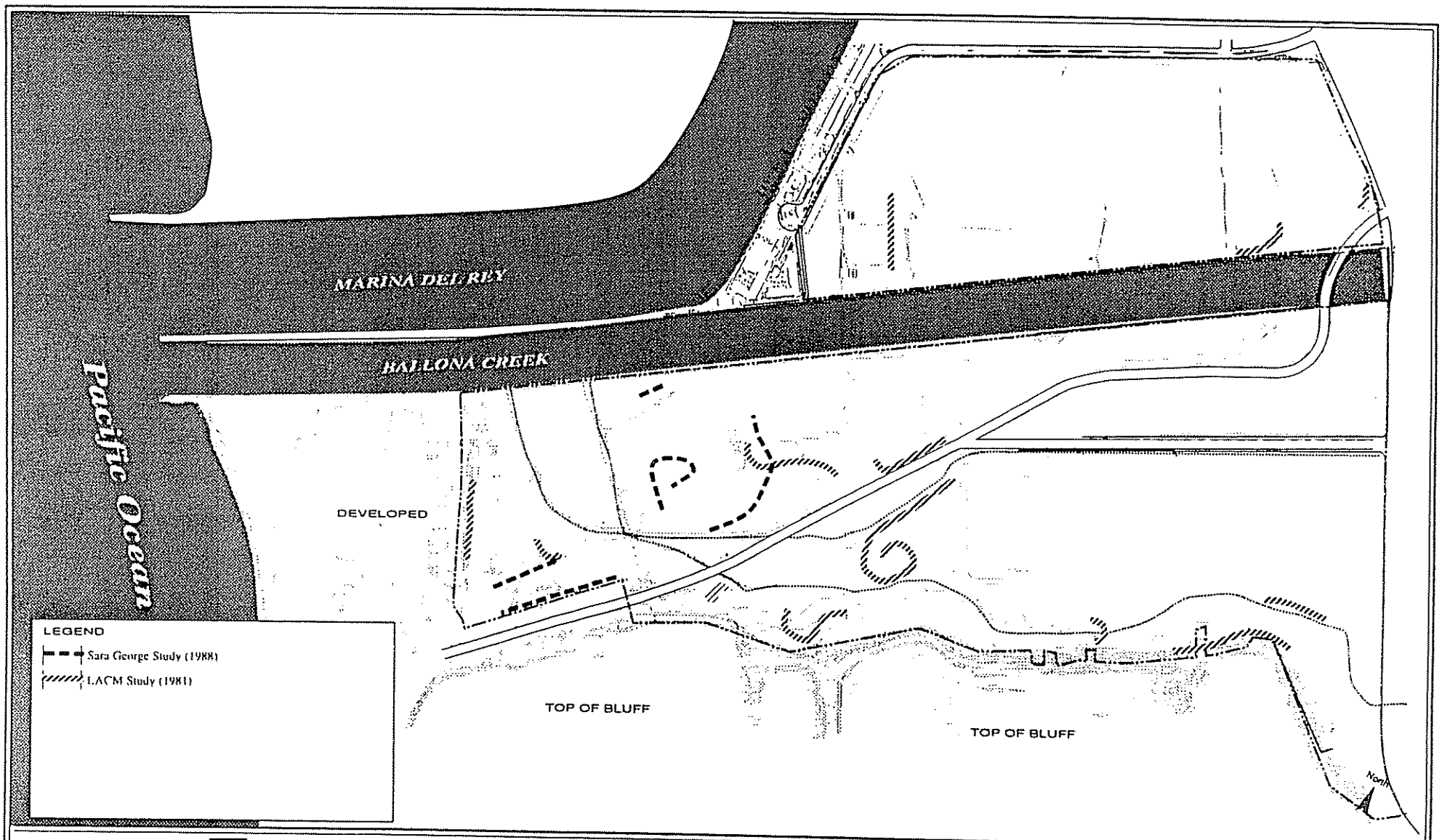


FIGURE 1
LOCATIONS OF PREVIOUS MAMMAL TRAPPING EFFORTS

CEQA Studies

The most recent biological investigation of the Project site was conducted by Frank Hovore & Associates between March 1990 and March 1991. While little specific information is provided relative to specific methodologies used to census mammals at the Project site (Frank Hovore & Associates, 1991), the report states that "All portions of Areas A, B, C, and D were investigated, and trap placements were situated to cover all potential natural habitats." This report further states that "Nearly 1,000 trapnights were accumulated, and all areas were also surveyed visually during the day." Locations of trap lines, trapping dates, and specific number of trapnights conducted during the small mammal trapping effort (which used Sherman extra-large 12-inch live traps) are not provided.

While complete results of the 1990-1991 small mammal trapping effort are not provided, a review of the Frank Hovore & Associates report (1991) suggests that five small mammal species were captured, and evidence of an additional species was observed. The following summary is based on a review of the text of the report, in which data are not presented but from which certain information can be discerned. Although not captured during the focused small mammal trapping effort, a single Southern California salt marsh shrew (*Sorex ornatus salicornicus*) was reported captured during February 1991 in Area B in a pitfall trap operated to sample insects as part of a related entomological study. During the small mammal trapping, the second most commonly captured species was the western harvest mouse (*Reithrodontomys megalotis*). This native mouse was recorded in Area B, and a small population was identified in Area C in association with ruderal habitat and isolated pickleweed patches. None was recorded in Areas A or D. Very few (most likely one or two) individuals of the dusky-footed woodrat (*Neotoma fuscipes*) were captured only in Area A, in what was described as remnant coastal sage scrub habitat. The most commonly captured small mammal was the introduced house mouse (*Mus musculus*). In Area A, house mice were captured in low numbers, while in Area B and C they were common, and were the only small mammal captured in Area D. Two individuals of the Stephens' vole (*Microtus californicus stephensi*) were captured: one each in Area A and Area B. In addition, Botta's pocket gopher (*Thomomys bottae*) was recorded during the 1990-1991 surveys as abundant.

A comprehensive survey of the flora and fauna of the Project site was conducted during 1980 and 1981, by the Natural History Museum of Los Angeles County (LACM). The results of these surveys were published in a document (LACM, Schreiber (ed.), 1981) which provided a compilation of a number of individual field investigations authored individually by one or a group of specialists. Mammals were studied by Richard Friesen, William Thomas, and Don Patton, who completed a field investigation which included 2,005 trapnights of effort (1,840 Sherman live trap and 165 Museum Special snap trap) on the Project site (Friesen et al., 1981). Trapping was limited to Areas A and B, and was conducted between July 1980 and May 1981.

In Area A, three trapping transects were established by LACM, and 365 trapnights of effort were conducted during August, September, November, 1980, and April 1981. In Area B, eight trapping transects were established (four north of Culver and Jefferson Boulevards, and four south of these roadways), and 1,640 trapnights of effort were conducted (900 in the northern portion during August, November, December, 1980 and April 1981; and 740 in the southern portion during August, September, November, 1980, and March and April 1981). One hundred traps set for one night equals 100 trapnights of effort, as does 10 traps set out for 10 nights. Habitats trapped by LACM included pickleweed stands, ruderal areas, sandy remnant dune substrates, dense grassy areas, and along surge channels.

The LACM study summarized the available information (including museum records) on the current and historic mammal populations of the Ballona Wetlands, and reported data from the 1980-1981 small mammal trapping effort. They identified nineteen species of mammals known to occur (reside or forage) in the Ballona Wetlands, and identified an additional 20 species which could potentially occur or might have historically occurred. However, few of these species were documented to occur in the study area, rather they are representative of the mammal fauna known to occur the region. The mammals recorded in Areas A and B during the 1980-1981 field study included Virginia opossum (*Didelphis virginiana*), desert cottontail (*Sylvilagus audubonii*), black-tailed jackrabbit (*Lepus californicus*), Botta's pocket gopher (*Thomomys bottae*), four species of small mammals captured during live trapping (as discussed below), possibly a common muskrat (*Ondatra zibethicus*), domestic dog (*Canis familiaris*), common gray fox (*Urocyon cinereoargenteus*), common raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), and striped skunk (*Mephitis mephitis*).

Results of the LACM live trapping effort included the capture of four small mammal species: western harvest mouse, Norway rat (*Rattus norvegicus*), house mouse and Stephens' vole. The first three taxa were captured in both Areas A and B, and consisted of only one western harvest mouse in Area A and 69 in Area B; two Norway rats each in Area A and Area B; and nine house mice in Area A and 62 in Area B. Three Stephen's voles were captured in Area B; but none was recorded in Area A. They also reported the capture of a Southern California salt marsh shrew in December 1980. It is unclear whether this specimen was taken from Area A or Area B, as it was captured in a pitfall trap operated to sample insects as part of a related entomological study in 1980-1981.

During the same general period, Envicom conducted a total of 494 trapnights of small mammal live trapping effort during September and October (presumably of 1978), and March (presumably of 1979). Various habitats at the Project site were trapped, and the only two species captured were western harvest mouse and house mouse. Over 100 individuals were captured, with the western harvest mice captured in weedy fields with pickleweed presumably in Area A or Area B, and the house mice

captured throughout all areas and habitats sampled. They also captured a young black-tailed jackrabbit. In addition, Envicom (1981) reported the occurrence of California ground squirrel (*Spermophilus beecheyi*), deer mouse (*Peromyscus maniculatus*), Norway rat, and black rat (*Rattus rattus*) although these three small mammals were not reported captured during the trapping effort.

Michael Brandman Associates (MBA) conducted reconnaissance-level field surveys during August, September, and October 1984. Apparently, MBA did not conduct a live-trapping program or other focused field survey efforts. Their report (MBA, 1984) provided essentially a summary of previously developed information. For example, MBA (1984) states "An independent evaluation in the present study concludes that probably no more than twenty species, including the domestic dog and cat, presently utilize the site."

Other Research

After the single Southern California salt marsh shrew was reported captured in late February 1991, Jesus Maldonado (LACM, presently at UCLA) conducted a small pitfall trapping program in Area B during June, 1991 (personal communication, Mr. J. Maldonado, UCLA). No Southern California salt marsh shrews were captured during this effort. However, two Stephens' voles and several western harvest mice were captured during this limited trapping effort near the bluffs of Area B.

In early November 1988, Dr. Sarah George (LACM, presently Director of the Utah Museum of Natural History), J. Maldonado, and other LACM biologists conducted small mammal live trapping in Area B. The focus of their trapping effort was to obtain specimens for use in a systematics and taxonomic study of the western harvest mouse in Southern California. Two hundred traps were set in pickleweed habitat along four trap lines on the night of November 4, 1988. A total of 32 captures were recorded during the 200 trapnight effort, including 29 western harvest mice and two Stephens' vole.

Two students, L.F. Soholt and K.G. Jollie, trapped in the Project site apparently during late 1968 and 1969 for a total effort of 532 trapnights. Results of their trapping were presented in a paper (Soholt and Jollie, 1969) provided to the Office of the Curator of Mammalogy, LACM. Two areas were trapped during the 1968-1969 study, both located in the northern portion of Area B. Forty small mammals were captured, including one Southern California salt marsh shrew, 18 western harvest mice, 19 house mice, and two Stephens' voles.

Mr. Rex Baker, a professional mammalogist, has conducted resource management activities at the Project site for about four or five years. He has spent considerable time in the field observing mammals, and was contacted for information regarding the status of red fox (*Vulpes vulpes*) and other medium-sized mammals at the Project site (personal communication, Mr. Rex Baker).

2.3 Summary of Data Requirements

The evaluation of the previously conducted mammal investigations revealed several substantial data gaps. As such, additional technical investigations were designed and conducted by Impact Sciences, Inc. primarily during 1996 to provide sufficient information to fill these gaps in biological knowledge relative to the mammal fauna at the Project site.

Specifically, comprehensive data concerning the structure of the general small mammal community were last gathered over 15 years ago, with only limited efforts expended between then and the present. In addition, data from certain of the more recent efforts seemed to indicate that certain components of this community were becoming less common. Based upon previous experience with the federally Endangered Pacific pocket mouse (*Perognathus longimembris pacificus*), Impact Sciences, Inc. felt that the Project site contained potential habitat (albeit degraded) to support this taxon. The need to evaluate the presence/absence of this sensitive pocket mouse, and to compile recent data on the structure of the small mammal community, represented a substantial gap in previously gathered data.

In addition, the current status of several sensitive mammals known to have previously occurred at the Project site was uncertain. To fill this gap, specific investigations were conducted to evaluate the status of the Southern California salt marsh shrew, Stephen's vole, and San Diego black-tailed jackrabbit (*Lepus californicus bennetti*). The status of several other small mammals which potentially occur but had not been previously recorded from the Project site was also evaluated during these investigations. These included the southern grasshopper mouse (*Onychomys torridus ramona*) and San Diego desert woodrat (*Neotoma lepida intermedia*). The status of the American badger (*Taxidea taxus*), which was not known to occur at the Project site but could potentially be present, was also evaluated.

The final gap in knowledge of the mammal fauna involved the use of the Project site by bats, roosting bats in particular. Investigations were conducted to fill this gap by searching for current bat roosts and evaluating the historic use of the Project site by roosting and foraging bats.

3.0 METHODS

3.1 Pre-Field Investigations

Literature Review

Prior to on-site investigations, a thorough review of relevant literature was conducted by Impact Sciences, Inc. biologists. To assist in identification of sensitive species which might be present on or utilize the site, the California Natural Diversity Data Base (CNDDB) computer printout reports (dated January 1995, and updated in March, 1996) for the Venice, Redondo Beach, Beverly Hills, Inglewood, Hollywood, San Pedro, Torrance, Long Beach, Malibu Beach, and Topanga USGS 7.5-minute topographic quadrangle maps were obtained from CDFG and reviewed. Other references consulted include publications provided by the California Department of Fish and Game (CDFG) Non-Game Heritage Program. Additional information accessed and reviewed regarding sensitive species included: (1) the Federal Register that documents federally listed Endangered or Threatened species; (2) literature pertaining to habitat requirements of sensitive species; (3) the CDFG Annual Report on the status of California's listed threatened and endangered plants and animals (1991), and Mammalian Species of Special Concern in California (Williams, 1986).

Museum Collection Search

Curators of scientific collections housed at the following institutions were contacted for information regarding mammal occurrence records from the Playa Vista area. Where appropriate, certain scientific collections were accessed during 1996, and specimens examined.

- Natural History Museum of Los Angeles County (LACM)
- Santa Barbara Museum of Natural History (SBMNH)
- San Diego Natural History Museum (SDNHM)
- Loyola Marymount University
- California State University Long Beach
- California State University Dominguez Hills
- Occidental College
- San Diego State University
- California State Polytechnic University San Luis Obispo
- Museum of Southwestern Biology, University of New Mexico
- Las Vegas Museum of Natural History

3.2 Agency Interaction

The Principal Investigator for the mammal investigations at the Project site, Mr. Scott Cameron, and Impact Sciences, Inc. Director of Biological Services, Mr. Brian Arnold, consulted with the USFWS and CDFG prior to the small mammal live trapping efforts. Specifically, a trapping study plan for the Pacific pocket mouse was developed and submitted to these agencies for review and concurrence. Upon completion of the initial small mammal trapping efforts, a brief report presenting the preliminary trapping results was submitted to both agencies. In addition, the Los Angeles County Department of Public Health Investigation was contacted for information concerning bats in the Playa Vista area which may have been reported to this agency by the public.

3.3 Description of Field Methods

Methodologies used during the current technical mammal investigations including focused field studies are detailed below. For certain sensitive species, state or federal resource agencies have defined specific study protocols to ensure that adequate data are collected. Where on-site investigations were conducted for such sensitive species, agency protocols were followed.

Many mammals are nocturnal and secretive, making daytime observation difficult and infrequent. Therefore, information on mammals present on the Project site was derived primarily from results of various sampling methods, as well as from known habitat preferences of individual species. Mammals were identified during walk-over surveys by direct observation and diagnostic sign such as scat, tracks, and burrows. A focused small mammal trapping plan was developed and implemented to provide current information on the small mammal fauna present at the Project site. Additional mammal sampling techniques (infrared camera stations, scent stations, hand-held and vehicle-mounted spotlight surveys, and hand-held ultra-sound bat detectors) were utilized to evaluate the presence of other sensitive mammals on the Project site.

3.3.1 Small Mammal Live-Trapping Programs

Pacific Pocket Mouse Live-Trapping Program

The current survey effort included a live-trapping program (using Sherman aluminum folding traps) for this endangered subspecies, due in part to historical occurrence records for this taxon in the immediate vicinity of the Project site, and the presence of remnant habitats potentially suitable to support this

taxon. Impact Sciences, Inc. has conducted extensive research relative to the biology of this endangered species. The live-trapping study was designed based on habitat suitability and focused on those areas assigned the highest probability for positive trapping results (approximately 100 acres). The setting of 3,232 trapnights resulted in a total of 3,215 effective trapnights of effort (after adjusting for closed or malfunctioning traps which may not have been available to capture an animal). This total included 2,782 trapnights on about 30 acres of habitats characterized as suitable, and 433 trapnights on about 70 acres of habitats characterized as marginally suitable. This effort translates to 92.7 trapnights conducted *per acre* in suitable habitats and approximately 6.2 trapnights *per acre* in marginally suitable habitats. This effort exceeded previous Pacific pocket mouse trapping efforts in terms of trapnights per acre (MBA's 1995 San Diego and Orange County effort resulted in about 5 trapnights per acre in 'low quality' habitat and approximately 35 trapnights per acre in 'prime' habitat; Brylski's 1993 Orange County effort resulted in 5.4 trapnights per acre of potential habitat). Impact Sciences, Inc. feels that the level of effort expended at the Project site provides a high degree of reliability in the evaluation of the presence/absence of this historically occurring subspecies. Moreover, the per acre effort mentioned above does not include 680 trapnights of pitfall trap effort conducted concurrently with the Sherman live-trapping, generally in areas not considered Pacific pocket mouse habitat. Pitfall traps have successfully captured Pacific pocket mice during other censusing programs.

The focused Pacific pocket mouse live-trapping effort was conducted in two-phases, an approach designed to increase the likelihood of capture success by trapping at different times during the mouse's optimal above ground activity period. The first phase of the trapping program was conducted between April 15-20, 1996 and included 1,273 effective trapnights of effort. The second phase of the trapping program was conducted during May, June, and July. Because inclement weather resulted in fewer trapnights than originally proposed in the study plan for the first phase, an additional 411 effective trapnights were conducted between May 2-4, 1996. The main effort of the second phase was conducted between June 18-22, 1996 and included 1,442 effective trapnights of effort. An additional 89 trapnights of effort was conducted on July 18, 1996 for a total of 1,942 second phase effective trapnights.

The Pacific pocket mouse trapping program concentrated on areas of sandy or friable substrates that are characterized by appropriate vegetation, topography, and other physical features. These factors are based on the current body of knowledge for this subspecies as presented in Von Bloeker (1931), Grinnell (1933), Meserve (1972), Brylski (1993), Erickson (1993), MBA (1995), and USFWS (1994), as well as personal observations made by Mr. Cameron during his involvement in extensive Pacific pocket mouse trapping programs conducted in Orange and San Diego counties. Based on extensive biological surveys, vegetation mapping, and a review of Los Angeles County General Soil Maps, the Project site was divided into sub-segments to reflect habitat areas possessing distinct levels of habitat suitability. As

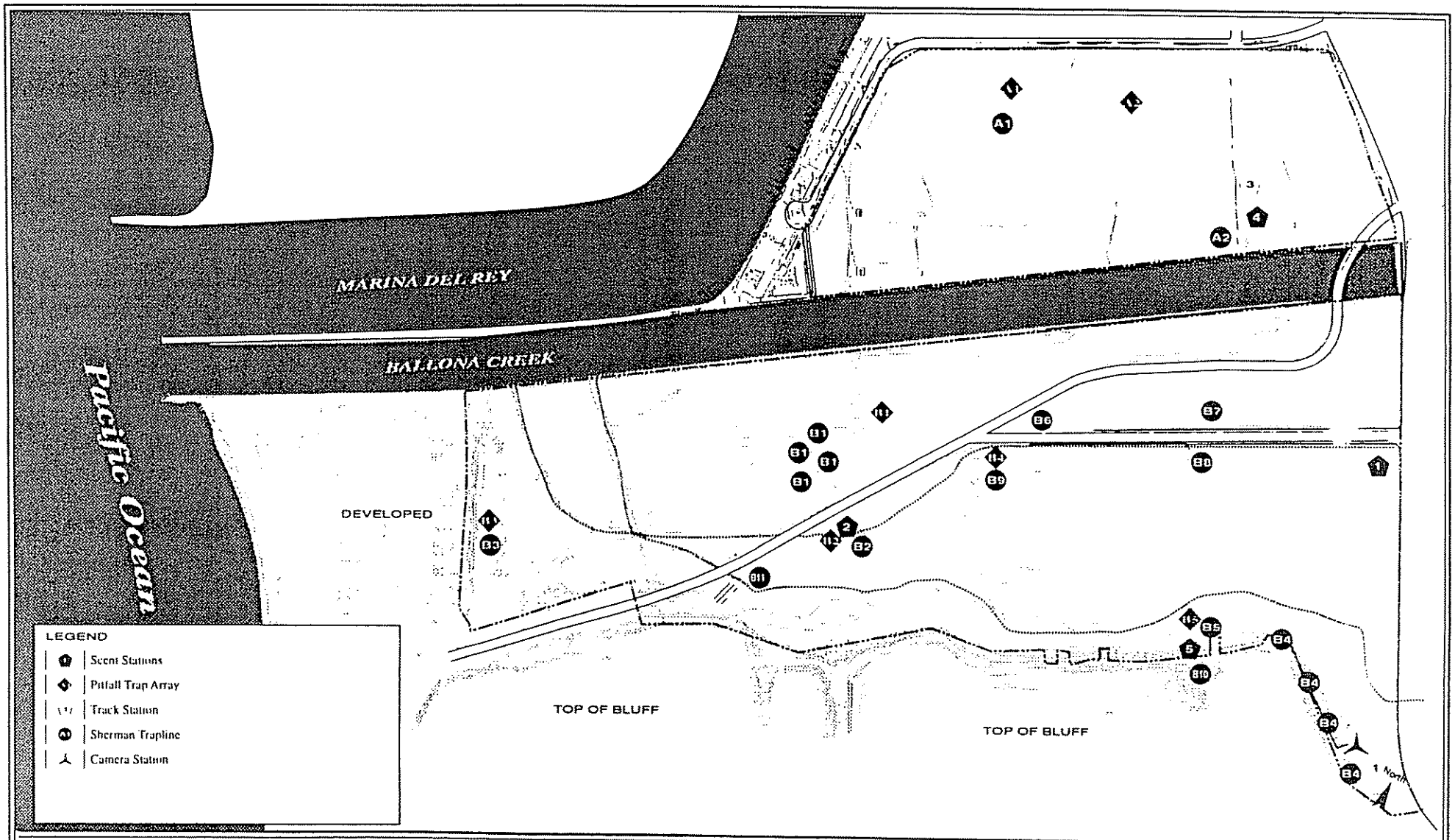
mentioned above, each area was surveyed at various levels of intensity (based on habitat suitability) The most prevalent soil type on the Project site is the Oceano Association. This soil type is characterized by sandy soils that occur on undulating dune-like areas between sea level to about 100 feet elevation. The locations of the live trap transects are shown on **Figures 2 and 3.**

Specific methodologies of the Sherman live-trapping program included: (1) ten nights of live-trapping at each location (and additional trapping locations sampled only once during the second phase), (2) traps set along transect routes at approximately 3-4 meter intervals in both suitable and marginally suitable habitats, (3) traps set at dusk, initially checked near midnight and again at dawn, and closed after the final dawn check (except during times of inclement weather), (4) traps baited with a mixture of rolled oats and wild bird seed, with paper towel batting placed in each trap, (5) traps used during the program included both extra-large (12-inch) and large (9-inch) Sherman live-traps carefully set to capture animals weighing a few grams, (6) each trapping team (two persons) monitored no more than 300 traps per night, (7) trapping was performed when the weather had been relatively dry for a period of at least five days, and the temperature was above 50 degrees Fahrenheit, (8) in accordance with standard and accepted scientific practices, all results and field notes were kept and maintained to record pertinent data (moon phase, temperatures, weather, vegetation component, etc.).

The Impact Sciences, Inc. mammal investigation team included Scott Cameron, who currently holds a valid federal endangered species permit issued under section 10(a)(1)(A) of the Endangered Species Act of 1973, as amended, to conduct live-trapping for Pacific pocket mouse (Permit Number PRT-808242), as well as a joint federal and state Scientific Collecting Permit (Permit Number 2876). Mr. Cameron participated in all phases of the mammal sampling programs except for bat surveys. Brian W. Arnold, participated in all phases of the mammal sampling programs including overall project management, and Mr. David Crawford participated in all phases of the mammal sampling programs except for bat surveys. Mr. Cameron, Mr. Arnold, and Mr. Crawford have extensive experience in conducting small mammal live-trapping studies and other mammal survey programs throughout Southern California.

Pitfall Trapping Program

Impact Sciences, Inc. performed an additional trapping program to evaluate the current status at the Project site of the Southern California salt marsh shrew, a taxon subspecifically endemic to coastal wetlands in Southern California. Portions of the Project site that support coastal salt marsh habitats dominated by pickleweed are primarily located in Areas A and B, and these were the primary focus of



Playa Vista EIS/EIR Vol. II
Affected Environment
Planning Consultants Research

Source: Impact Sciences, Inc., 6/96.

FIGURE 2
LOCATIONS OF 1996 MAMMAL SAMPLING EFFORTS AREAS A&B

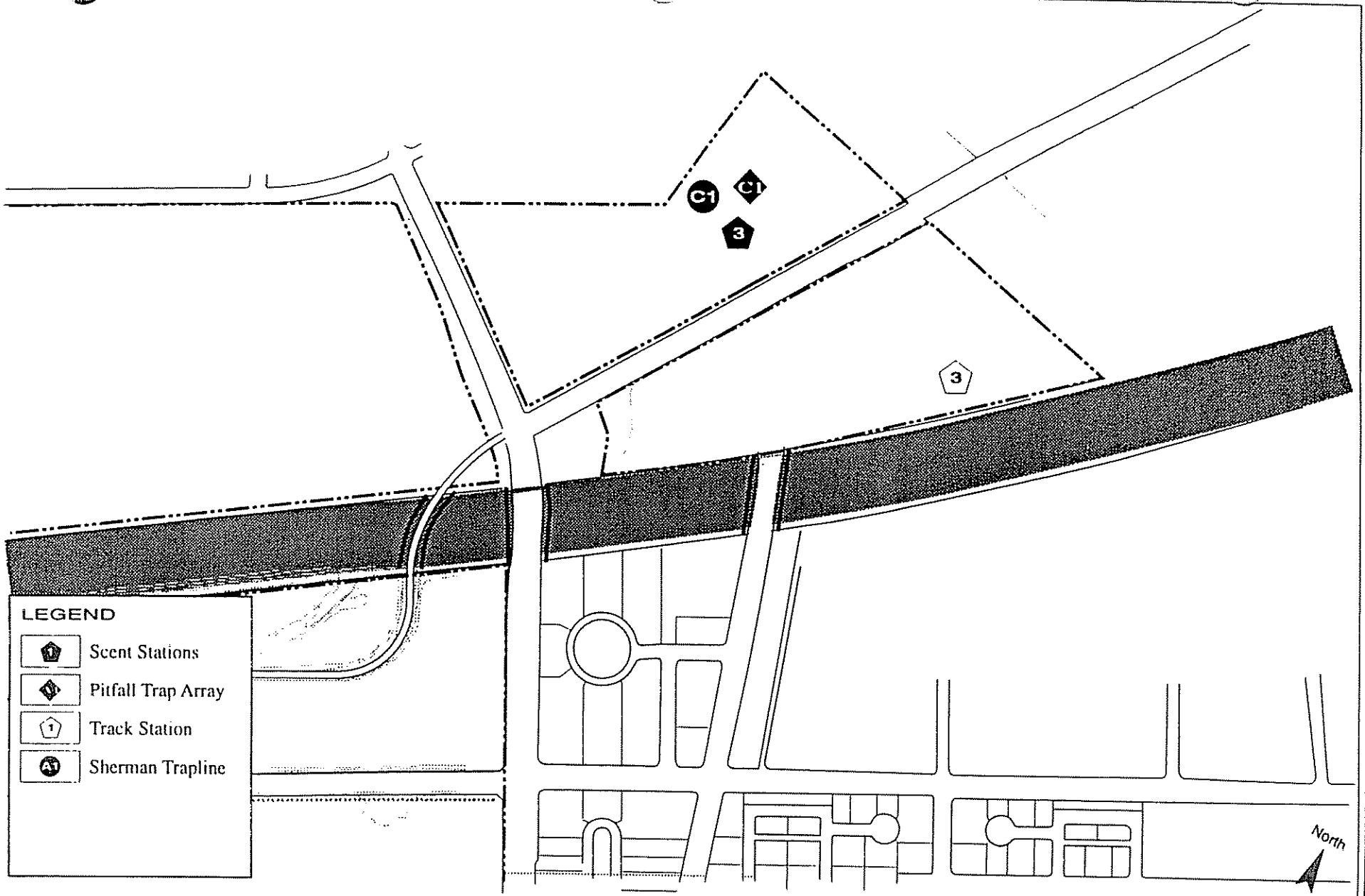


FIGURE 3
LOCATIONS OF 1996 MAMMAL SAMPLING EFFORTS AREA C

Source: Impact Sciences, Inc., 6/96

10/14/96

the mammal pitfall trapping program. The pitfall trapping study areas were selected based on specific physical features such as vegetation types. Topographic and other physical features were also considered in the placement of the pitfall study areas. Playa del Rey is a type locality for this subspecies (Von Bloeker, 1939 in Hall, 1981).

Because Sherman live-traps are not appropriate for shrew trapping, and shrews are not typically attracted to standard seed-bait mixtures, a pitfall trapping array was employed on site to more fully evaluate the potential presence of this sensitive subspecies. Each pitfall array consisted of 10 pitfall traps with six sections of plastic drift fence (6 sections x 5 meters in length x 20 centimeters in height). The central pitfall was placed approximately 2.5 meters from the nearest pitfall in each of the three pitfall/drift fence arms. The other six pitfalls were separated by five meters. The three arms of the array (Y-shaped) were separated by 120 degrees which minimizes directional bias in sampling. The pitfall traps consisted of plastic containers (approximately 8-inches deep) with "snap-on" lids so that the traps could be closed (for example, during inclement weather). Meal-worms, peanut butter, and other suitable bait attractant (including the invertebrates naturally collected in the traps) were placed in or allowed to remain in the basin of the pitfall traps. The pitfall trapping program was conducted during the same two-phase intervals as the Pacific pocket mouse trapping program. Fourteen shrew trapping arrays were established (nine placed in relatively high quality upland salt marsh habitat). Four were placed in Area A (all in high quality habitat), eight in Area B (five in high quality habitat), and two in C (no high quality shrew habitat was present). During the trapping program a total of 680 pitfall trapnights of effort was recorded, with 440 trapnights in high quality habitat. The location of the pitfall trap arrays are shown on **Figures 2 and 3**.

3.3.2 Black-Tailed Jackrabbit Walk-Over Surveys

A focused investigation was conducted to evaluate the nature and extent of the use of the Project site by the San Diego black-tailed jackrabbit. Walk-over field surveys were conducted in areas supporting grasslands and shrublands by biologists familiar with lagomorphs, and were designed to search for jackrabbits and evaluate relative abundance between the four Project site parcels. The biologists walked initial parallel belt transects over the entire area to search for black-tailed jackrabbits or their sign including scat and tracks. Four subsequent walk-over surveys were conducted in the early morning and early evening, concentrating in areas with the most appropriate habitat to support black-tailed jackrabbits.

3.3.3 *Scent Stations*

Five scent stations were established and monitored for a two-night period during January, 1996 to evaluate the use of the site by carnivores active at nighttime which may not be identified through other survey methods. Scent stations were established by carefully clearing an area approximately four feet in diameter and layering the clearing with smoothed diatomaceous earth. An opened can of cat food was placed in the center of the station. The diatomaceous earth provides a suitable substrate to allow deposition and facilitate the identification of tracks. Scent Station 1 was placed in Area B located south of Jefferson Boulevard; Scent Station 2 was placed in Area B along a disturbed wellsite road located south of Culver Boulevard and west of the Culver Boulevard and Jefferson Boulevard intersection; Scent Station 3 was placed in Area C in a weedy disturbed flat area located north of Culver Boulevard; Scent Station 4 was placed in Area A along an old dirt road located near the southeastern corner; and Scent Station 5 was placed in Area B along the Del Rey Bluffs road located adjacent to remnant coastal sage scrub habitat near Hastings Canyon. The location of scent stations are illustrated on **Figures 2 and 3**.

3.3.4 *Spotlight Surveys*

Two spotlight surveys were conducted during January 1996. Nighttime spotlight surveys were conducted by both vehicle and pedestrian spotlighting methods. Vehicular spotlight surveys were performed by slowly driving along existing dirt roads and sweeping an area with a 1,000,000 candlepower spotlight. Pedestrian spotlight surveys were conducted using 500,000 candlepower portable hand-held spotlights while walking predetermined transect routes through on-site habitats. Jackrabbits and other night-active wildlife were searched for during these surveys. The spotlight surveys were conducted only in areas where it was safe to do so, and only with the concurrence of local law enforcement agencies and the cooperation of the contracted security agency. In addition, while transiting between locations during the bat survey (see below) the biologist searched for wildlife using vehicle headlights and a 500,000 candlepower spotlight.

3.3.5 *Track Stations*

In an effort to evaluate the relative amount of wildlife use of the four different parcels, track stations were established in January 1996 along existing trails and other spots which appeared likely to be used by transiting wildlife. These stations were about one square meter in size, and were smoothed and

layered with a diatomaceous earth to record tracks. The stations were set in the early evening, and checked early the following morning and reset. Tracks were identified using technical references and the knowledge of the biologist. The location of track stations are illustrated on **Figures 2 and 3.**

3.3.6 *Infrared Camera Station*

An infrared camera station was established in Area B, located west of Lincoln Boulevard and east of the Del Rey Bluffs road. The camera was placed along an existing wildlife path located in an area supporting sandy substrates, and was set to record all events over a 12 hour period. Any animal that passes through the detection beam would trigger a camera and be photographed for later identification. This camera station was operated over a two-day period in January, 1996. The location of the infrared camera station is illustrated on **Figure 2.**

3.3.7 *Bat Investigation*

A bat investigation consisting of a review of the pertinent literature, contacts with public health agencies, and accession of museum records of occurrence (as previously described) was conducted. In addition, a field investigation was conducted by Mr. Brian Arnold. During the field survey conducted primarily during July 1996, the underside of all accessible bridges on the Project site were examined for the presence of guano and staining which would indicate a bat roost site. Bridges which could not be examined for roosting bats by accessing underneath the structure (such as the middle of the Ballona Channel spans) were surveyed in April, July and September 1996 using a hand-held bat detector (Pettersson D 100 Ultrasound Detector with a range of 15-120 kHz) to detect the high frequency echo location and other signals emitted by bats during foraging. In Area D, the older buildings, cooling towers and storage areas which may be used by roosting bats were examined for guano, staining, and other indications of bats. All appropriate buildings and other structures were carefully searched, especially when openings in walls and windows which would allow bat use were observed.

4.0 RESULTS

4.1 General Mammal Species

Results from walk-over and spotlight surveys, live trapping, and monitoring of scent, track, and camera stations indicate the presence of a variety of mammals on the Project site. Mammals which have been documented to occur in this and previous studies are included in **Table 1**. Common mammals present at the Project site are dominated by non-native species which can aggressively compete with the native

Table 1
Mammal Species Known to Occur at the Playa Vista Project Site

Scientific Name	Common Name	Occurrence	Habitat
DIDELPHIDAE	OPOSSUMS		
Didelphis virginiana	Virginia Opossum	P, R	Ow,Rw,Rs,DR
SORICIDAE	SHREWS		
Sorex ornatus salicornicus	Southern California Salt Marsh Shrew	R	Rw,Aq
TALPIDAE	MOLES		
Scapanus latimanus	Broad-footed Mole	P	Rw,Sc,Gr
LEPORIDAE	HARES and RABBITS		
Sylvilagus audubonii	Desert Cottontail	O, R, P	Ch,Css,Ow,Os,DR
Sylvilagus bachmani	Brush Rabbit	R	Rw,Rs
Lepus californicus bennettii	San Diego Black-tailed Jackrabbit	R, P	Ch,Css,Os,Gr
SCIURIDAE	SQUIRRELS and CHIPMUNKS		
Spermophilus beecheyi	California Ground Squirrel	O, R	Ch,Css,Os,Gr
GEOMYIDAE	POCKET GOPHERS		
Thomomys bottae	Botta's Pocket Gopher	O, R, P	Os,DR,Gr
HETEROMYIDAE	KANGAROO RATS and POCKET MICE		
*Perognathus longimembris pacificus**	Pacific Pocket Mouse	M	Ch,Ow
MURIDAE	MICE, RATS, and VOLES		
Reithrodontomys megalotis	Western Harvest Mouse	O, R	Gr,Du,DR,Css
*Peromyscus maniculatus**	Deer Mouse	M	Gr,Ow,Os,Rs,Rw
*Rattus norvegicus***	Norway Rat	O, R	DR
*Rattus rattus **	Black Rat	O, R	DR,Gr
*Mus musculus **	House Mouse	O, R	DR,Gr
Microtus californicus stephensi	Stephens' California Vole	O, R	Aq,Gr,Rw
CANIDAE	DOGS, WOLVES, and FOXES		
*Canis familiaris **	Feral Dog	O, R, P	DR,Sc
*Canis latrans**	Coyote	R	Os,Ch,Css
*Vulpes vulpes***	Red Fox	O, P	Gr,Ow,Os,Rs,Rw
*Urocyon cinereoargenteus**	Common Gray Fox	R	Ch,Ow
PROCYONIDAE	RACCOONS		
Procyon lotor	Common Raccoon	P, R	Rw,Rs
MUSTELIDAE	MUSTELIDS		
Mustela frenata	Long-tailed Weasel	R	Rw,Rs,Ow,Hf
Mephitis mephitis	Striped Skunk	O, P, R	Ow,Rw,Sc,Rs
FELIDAE	CATS		
*Felis catus **	Feral Cat	O, P, R	DR,Sc,Rs

KEY:

Evidence of occurrence: O = Observed or recorded during current studies; M = Museum specimen; P = Personal communication to Impact Sciences, Inc ; R = Reported to occur in previous reports.

* Believed extirpated from the Project site.

** Introduced species.

Habitat:
Aq= Aquatic habitats: open water, stream, and marsh
Ch= Chaparral
Css= Coastal sage scrub
DR= Disturbed/Ruderal
Du= Dunes
Gr= Grassland
Hf= Mixed hardwood forest
Os= Oak savanna
Ow= Oak woodland
Rs= Riparian scrub
Rw= Riparian woodland
Sc= Various scrub habitats from coastal sage scrub to low chaparral

fauna and, in some cases, may displace native mammal species. Red fox (*Vulpes vulpes*), an introduced predator, appears to dominate the medium-sized mammal community, and is likely responsible for reduced densities of ground nesting birds and native small mammals. Coyotes (*Canis latrans*) no longer occur at the Project site, and have likely been extirpated. The common gray fox (*Urocyon cinereoargenteus*) was observed during the 1980-1981 surveys, but does not likely occur now, perhaps due to competition from the red fox. Domestic dogs roam throughout the Project site, as do domestic cats. The various small mammal trapping efforts conducted since 1980 all produced a substantial percentage of non-native captures. This percentage appeared to be increasing to a point in 1996 when non-natives represented 82 percent of all captures. These non-native species include the house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), and black rat (*Rattus rattus*).

Desert cottontail (*Sylvilagus audubonii*) and Virginia opossum (*Didelphis virginiana*) are common on the Project site, especially in the marsh areas in Area B north and west of Culver Boulevard. Other common native mammals include common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), California ground squirrel (*Spermophilus beecheyi*), and Botta's pocket gopher (*Thomomys bottae*). Western harvest mice (*Reithrodontomys megalotis*) occur in relatively high numbers throughout Areas A and B in patches of pickleweed, remnant upland coastal sage scrub, and ruderal habitats. Broad-footed moles (*Scapanus latimanus*) have been reported infrequently on the Project site during previous survey efforts. During a 1990-1991 survey effort, a single dusky-footed woodrat (*Neotoma fuscipes*) was trapped. A skull of a long-tailed weasel (*Mustela frenata*) was found during the 1980-1981 surveys, and this species likely still occurs.

Common bat species that may forage over the open wetlands include the California myotis (*Myotis californicus*), western pipistrelle (*Pipistrellus hesperus*), big brown bat (*Eptesicus fuscus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*). There are no documented records of bat occurrence specifically from the Project site, but there are museum records of various species from nearby areas such as Culver City.

4.1.1 Small Mammal Live-Trapping Programs

No Pacific pocket mouse were captured during the 3,215 effective trapnights of small mammal live-trapping conducted at the Project site. A total of 324 mammals in six species were captured. Results included 262 house mice (80.9 percent of total captures), 41 western harvest mice (13.3 percent), 14 Stephens' voles (4.3 percent), three black rats (0.9 percent), one Norway rat (0.3 percent), and one Botta's pocket gopher (0.3 percent). Of all captured small mammal individuals, 58 (17.9 percent) were native, and 266 (82.1 percent) were non-native; three of the six species (50 percent) were native.

Sherman Live-Trapping Results

The results of the live-trapping effort are presented in tabular format on the following pages.

Area A: Sherman Live-Trapping Results

In Area A, 78 small mammals were captured during 469 effective trapnights (after correcting for traps closed, nonfunctional, or with reptile or amphibian captures) of effort, for a capture success rate of 16.6 percent. Captures included 73 house mice (about 94 percent), two western harvest mice (about 3 percent), one Botta's pocket gopher (about 1 percent of total captures), one black rat (about 1 percent), and one Norway rat (about 1 percent).

Transect: AST-1
Habitat type: Mule fat and coyote scrub with non-native annual grassland and disturbed weedy areas.
Description: Traps placed in a small depression supporting mule fat (*Baccharis salicifolia*) and coyote brush (*Baccharis pilularis*) with foxtail chess (*Bromus madritensis*), ripgut grass (*Bromus diandrus*), filaree (*Erodium* spp.), slender wild oat (*Avena barbata*), fescue (*Festuca* sp.), Bermuda grass (*Cynodon dactylon*), sweetclover (*Melilotus* spp.), and black mustard (*Brassica nigra*) comprising the understory.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1 only					
4-16-96	*Mus musculus*	25	25	1/SA-male	4%
4-17-96	—	25	25	—	0%
4-18-96	*Mus musculus*	25	25	2/A-male	8%
4-19-96	*Mus musculus* *Reithrodontomys megalotis*	25	25	1/A-male 1/SA-female 1/SA-female	12%
4-20-96	*Mus musculus* *Reithrodontomys megalotis* *Thomomys bottae*	25	24	1/SA-female 1/A-male 1/A-male 1/A-female	17%
	Totals	125	124	10 *M. musculus* (n=7; 70%) *R. megalotis* (n=2; 20%) *T. bottae* (n=1; 10%)	8%

Transect: AST-2
Habitat type: Remnant coastal sage scrub vegetation with sandy substrate.
Description: Traps placed in area supporting an influx of California sagebrush (*Artemisia californica*), California broom (*Lotus scoparius*), telegraph weed (*Heterotheca grandifolia*), with scattered laurel sumac (*Malosma laurina*), and castor bean (*Ricinus communis*). Foxtail chess, ripgut grass, tocalote (*Centaurea melitensis*), and black mustard comprised the understory.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-17-96	*Mus musculus*	25	24	1/SA-male 1/A-female	8%
4-18-96	—	25	25	—	0%
4-19-96	*Mus musculus* *Rattus rattus*	25	25	3/A-male 2/SA-male 2/SA-female 1/SA-male	32%
4-20-96	*Mus musculus*	25	25	2/A-male 1/A-female 2/SA-female	20
	Subtotals	**100**	**99**	15 *M. musculus* (n=14; 93%) *R. rattus* (n=1; 7%)	15%
Phase 2 (AST-2)					
6-18-96	*Mus musculus*	50	50	2/A-male 1/A-female	4%
6-19-96	*Mus musculus* *Sceloporus occidentalis*	50	50	2/A-male 1/A-female 2/SA-male 1/A-female	12%
6-20-96	*Mus musculus* *Rattus norvegicus* *Sceloporus occidentalis*	50	50	4/A-male 4/A-female 1/J-male 1/J-female 1/A-female 1/A-female	24%
6-21-96	*Mus musculus*	50	49	6/A-male 5/A-female 2/SA-male 1/SA-female 2/J-male	32%
6-22-96	*Mus musculus*	50	49	5/A-male 4/A-female 1/SA-male 2/SA-female 2/J-male 4/J-female	36%
	Subtotals	**250**	**248**	55 *M. musculus* (n=52; 94%) *R. norvegicus* (n=1; 2%) *S. occidentalis* (n=2; 4%)	22%
Two-Phase Trapping Summary					
	Totals	350	347	70 *M. musculus* (n= 66; 94%) *R. rattus* (n=1; 1.5%) *R. norvegicus* (n=1; 1.5%) *S. occidentalis* (n=2; 3%)	20%

Area B: Sherman Live-Trapping Results

In Area B, 229 small mammals were captured during 2,486 effective trapnights (after correcting for traps closed, nonfunctional, or with reptile or amphibian captures) of effort, for a capture success rate of 9.2 percent. Captures included 172 house mice (about 75 percent), 41 western harvest mice (about 18 percent), 14 Stephens' voles (about 6 percent), and two black rats (about 1 percent).

Transect: BST-1
Habitat type: Remnant disturbed coastal sage scrub.
Description: Traps placed along and adjacent to wellsite roadways (raised areas) in four distinct areas supporting California sagebrush with a dense understory coverage of foxtail chess, ripgut grass, filaree, slender wild oat, Bermuda grass, tocolote, telegraph weed, stephanomeria (*Stephanomeria* sp.), Russian thistle (*Salsola tragus*), London rocket (*Sisymbrium irio*), Australian saltbush (*Atriplex semibaccata*), tarweed (*Madia* sp.), and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-16-96	*Mus musculus* *Bufo boreas* *Rattus rattus* *Microtus californicus stephensi* *Reithrodontomys megalotis*	25	25	7/A-male 2/SA-male 1/A-female 1/A-not sexed 1/A-male 1/A-male 1/SA-female	56%
4-17-96	*Mus musculus* *Microtus californicus stephensi*	25	25	2/A-male 2/SA-male 1/A-female 1/SA-female 1/SA-female	28%
4-18-96	*Mus musculus*	25	25	5/A-male 2/SA-male 1/A-female 1/SA-female	36%
4-19-96	*Mus musculus* *Reithrodontomys megalotis*	25	25	1/A-male 1/SA-male 1/A-female 1/SA-female	16%
4-20-96	*Mus musculus* *Reithrodontomys megalotis*	25	25	7/A-male 2/SA-male 3/A-female 3/SA-female 1/A-female 1/SA-female	68%
	Subtotals	125	125	51 *M. musculus* (n=43; 84%) *R. megalotis*(n=4; 8%) *M.c. stephensi* (n=2; 4%) *R. rattus* (n=1; 2%) *Bufo boreas* (n=1; 2%)	41%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (BST-1)					
6-18-96	*Microtus californicus stephensi* *Reithrodontomys megalotis* *Mus musculus*	26	26	1/A-male 1/SA-male 1/A-female 1/A-male 1/A-female	19%
6-19-96	*Microtus californicus stephensi* *Reithrodontomys megalotis*	26	26	1/A-male 1/A-female 1/SA-female 4/A-male 2/SA-female 1/A-female	38%
6-20-96	*Microtus californicus stephensi* *Reithrodontomys megalotis* *Mus musculus*	26	26	2/A-male 2/A-female 1/A-male 1/A-female 2/A-male 4/A-female 1/SA-female 1/J-female 1/J-male	58%
6-21-96	*Microtus californicus stephensi* *Reithrodontomys megalotis* *Mus musculus*	26	26	1/A-male 1/A-female 1/A-male 1/A-female 1/A-male 1/SA-male 1/SA-female 2/J-female	35%
6-22-96	*Reithrodontomys megalotis* *Mus musculus*	26	26	1/SA-male 1/A-male 3/A-female 1/SA-female 4/J-male 1/J-female	42%
	Subtotals	**130**	**130**	**50** *M.c. stephensi* (n=10; 20%) *R. megalotis* (n=15; 30%) *M. musculus* (n=25; 50%)	**38%**
Two-Phase Trapping Summary					
	Totals	**255**	**255**	**101** *M.c. stephensi* (n=12; 12%) *R. megalotis* (n=19; 19%) *M. musculus* (n=68; 67%) *R. rattus* (n=1; 1%) *B. boreas* (n=1; 1%)	**40%**

Transect: BST-2
Habitat type: Remnant coastal sage scrub/salt marsh ecotone
Description: Traps placed along and adjacent to wellsite roadway (raised areas) in an area supporting small patches of California sagebrush. Salt marsh habitat dominated by pickleweed (*Salicornica virginica*) located directly adjacent to upland sage scrub area (ecotone). Upland understory comprised of foxtail chess, ripgut grass, filaree, slender wild oat, Bermuda grass, tocalote, telegraph weed, stephanomeria, Russian thistle, London rocket, Australian saltbush, tarweed, and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1 only					
4-17-96	*Mus musculus* *Reithrodontomys megalotis*	20	20	1/SA-male 1/A-female 1/A-female	15%
4-18-96	*Mus musculus*	20	20	1/SA-male 1/SA-female	10%
4-19-96	*Mus musculus* *Reithrodontomys megalotis* *Rattus rattus*	20	20	4/A-male 1/A-female 2/SA-female 1/A-male 1/SA-male 1/A-female 1/SA-female	55%
4-20-96	*Mus musculus*	20	20	5/A-male 1/SA-male 1/A-female 4/SA-female	55%
	Totals	**80**	**80**	**27** ***M. musculus* (n=22; 81%)** ***R. megalotis* (n=4; 15%)** ***R. rattus* (n=1; 4%)**	**34%**

Transect: BST-3
Habitat type: Remnant coastal dune.
Description: Traps placed in coastal dune habitat comprised of sand verbena (*Verbena* sp.), croton (*Croton californicus*), dune buckwheat (*Eriogonum parvifolium*), bush lupine (*Lupinus chamissonis*), beach evening primrose (*Camissonia cheiranthifolia* ssp. *suffruticosa*), suffrutescent wallflower (*Erysimum insulare* ssp. *suffrutescens*), foxtail chess, ripgut grass, filaree, slender wild oat, telegraph weed, iceplant (*Carpobrotus edulis*), stephanomeria, and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-17-96	*Mus musculus*	30	30	1/A-male 1/SA-male	7%
4-18-96	—	30	30	—	0%
4-19-96	—	30	30	—	0%
4-20-96	*Mus musculus*	30	30	1/A-female 1/SA-female	7%
	Subtotals	**120**	**120**	**4** ***M. musculus* (n=4; 100%)**	**3%**

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (BST-3)					
6-18-96	—	50	50	—	0%
6-19-96	—	50	50	—	0%
6-20-96	*Mus musculus*	50	49	1/A-female	2%
6-21-96	*Mus musculus*	50	50	1/SA-female 1/SA-female	4%
6-22-96	*Mus musculus*	50	50	1/A-male	2%
	Subtotals	**250**	**249**	4 *M. musculus* (n=4; 100%)	2%
Two-Phase Trapping Summary					
	Totals	370	369	8 *M. musculus* (n=8; 100%)	2%

Transect: BST-4
Habitat type: Remnant disturbed coastal bluff scrub.
Description: Traps placed along and adjacent to wellsite roadway in four distinct areas comprised of grassy slopes and scattered shrubs. The bluffs contain California sagebrush, bush lupine, California-aster (*Lessingia filaginifolia*), California broom, brickellbush (*Brickellia californica*), tree tobacco (*Nicotiana glauca*), narrow-leaved bedstraw (*Galium angustifolium*), croton, castor bean, mule fat, melic (*Melica* sp.), foxtail chess, ripgut grass, filaree, slender wild oat, tocalote, telegraph weed, stephanomeria, Russian thistle, Australian saltbush, and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-17-96	*Mus musculus* *Reithrodontomys megalotis*	70	70	2/A-male 2/SA-male 1/A-female 1/SA-female 1/A-female	10%
4-18-96	*Mus musculus* *Reithrodontomys megalotis*	70	70	2/A-female 1/SA-female	4%
4-19-96	*Mus musculus*	70	70	1/SA-male 1/A-female 3/SA-female	7%
4-20-96	*Mus musculus* *Reithrodontomys megalotis*	70	70	3/A-male 4/SA-male 1/A-female 3/SA-female 1/SA-female	17%
	Subtotals	**280**	**280**	27 *M. musculus* (n=24; 89%) *R. megalotis* (n=3; 11%)	10%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (BST-4)					
5-4-96	*Mus musculus*	178	176	1/A-male 1/A-female	1%
7-19-96	—	30	29	—	0%
	Subtotals	208	205	2 *M. musculus* (n=2; 100%)	0%
Two-Phase Trapping Summary					
	Totals	488	485	29 *M. musculus* (n=26; 90%) *R. megalotis* (n=3; 10%)	6%

Transect: BST-5
Habitat type: Sandy alluvial fan.
Description: Traps placed throughout a depositional sandy fan from the Hasting's Canyon drainage. Vegetation is comprised of California broom, croton, castor bean, pampas grass (*Cortaderia jubata*), tree tobacco, coyote brush, California sagebrush, horseweed (*Conyza canadensis*), foxtail chess, ripgut grass, filaree, slender wild oat, telegraph weed, black mustard, wild radish (*Raphanus sativus*), and Russian thistle.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-17-96	*Mus musculus* *Reithrodontomys megalotis*	80	80	2/A-male 3/SA-male 3/A-female 1/A-female 2/SA-female	14%
4-18-96	*Mus musculus* *Reithrodontomys megalotis*	80	80	1/A-male 1/SA-male 1/A-female 1/A-male 1/SA-male	6%
4-19-96	*Mus musculus* *Reithrodontomys megalotis*	80	80	1/SA-male 1/SA-female 1/A-male 2/SA-female	6%
4-20-96	*Mus musculus* *Reithrodontomys megalotis* *Sceloporus occidentalis*	80	80	1/A-male 2/SA-male 1/A-female 2/SA-female 1/A-male 1/A-female	10%
	Subtotals	320	320	29 *M. musculus* (n=19; 66%) *R. megalotis* (n=9; 31%) *S. occidentalis* (n=1; 3%)	9%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (BST-5)					
5-4-96		60	59	—	0%
6-18-96	*Mus musculus*	100	100	1/A-female	1%
6-19-96	*Mus musculus* *Sceloporus occidentalis*	100	98	1/SA-male 1/A-male 1/SA-male	3%
6-20-96	*Reithrodontomys megalotis* *Mus musculus*	100	100	1/A-male 1/A-female	2%
6-21-96	*Mus musculus* *Sceloporus occidentalis*	100	99	2/A-female 1/SA-female 1/SA-female	4%
6-22-96	*Reithrodontomys megalotis* *Mus musculus* *Sceloporus occidentalis* *Uta stansburiana*	100	100	1/A-male 1/A-male 1/A-female 1/A-male 2/A-female	6%
7-19-96	—	60	60	—	0%
	Subtotals	**620**	**616**	**16** *R. megalotis* (n=2; 12.5%) *M. musculus* (n=8; 50%) *S. occidentalis* (n=4; 25%) *U. stansburiana* (n=2; 12.5%)	**3%**
Two-Phase Trapping Summary					
	Totals	**940**	**936**	**45** *R. megalotis* (n=11; 24%) *M. musculus* (n=27; 60%) *S. occidentalis* (n=5; 11%) *U. stansburiana* (n=2; 5%)	**5%**

Transect: BST-6

Habitat type: Disturbed grassy flats.

Description: Traps placed in an area supporting dense strands of bassia (*Bassia hyssopifolia*), with brome grasses (*Bromus* spp.), slender wild oat, barley (*Hordeum* sp.), Russian thistle, Australian saltbush, telegraph weed, ryegrass (*Lolium* sp.), and a few scattered shrubs.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 only					
5-3-96	*Mus musculus*	30	29	6/A-male 1/A-not sexed 1/A-female	28%
	Totals	30	29	8 *M. musculus* (n=8; 100%)	28%

Transect: BST-7
Habitat type: Disturbed grassy flats.
Description: Traps placed in dense stands of alkali weed (*Cressa truxillensis*) with brome grasses.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 only					
5-3-96	*Mus musculus*	30	30	3/A-male	10%
	Totals	**30**	**30**	**3** ***M. musculus* (n=3; 100%)**	**10%**

Transect: BST-8
Habitat type: Disturbed grassy flats.
Description: Traps placed in dense stands of bassia (*Bassia hyssopifolia*) with brome grasses, slender wild oats, ryegrass, Russian thistle, and alkali weed.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 only					
5-3-96	*Mus musculus*	30	28	2/A-male	7%
	Totals	**30**	**28**	**2** ***M. musculus* (n=2; 100%)**	**7%**

Transect: BST-9
Habitat type: Old fields with ryegrass.
Description: Traps placed in pickleweed with ryegrass, brome grasses, radish, sweet clover, curly dock (*Rumex crispis*), and bristly ox-tongue (*Picrus echioides*).

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 only					
5-3-96	*Mus musculus*	29	29	1/A-male 1/A-female	7%
	Totals	**29**	**29**	**2** ***M. musculus* (n=2; 100%)**	**7%**

Transect: BST-10
Habitat type: Upper Hastings Canyon sandy fan.
Description: Traps placed within Hasting's Canyon drainage. Area supports plant species characteristic of sandy soils such as croton, California broom, and California sagebrush, as well as non-native plant species such as tree tobacco, castor bean, and pampas grass.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 only					
5-4-96	—	60	60	—	0%
	Totals	60	60	0	0%

Transect: BST-11
Habitat type: Seasonally wet pickleweed flats/upland ecotone
Description: Traps placed along Centinela Creek in an area of intergradation between pickleweed and non-native annual grassland habitat types. Characteristic plant species include pickleweed, salt grass (*Distichlis spicata*), Australian saltbush, alkali weed, ryegrass, brome grasses, beard grass (*Polypogon* sp.), curly dock, and prickly lettuce (*Lactuca serriola*).

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 only					
6-18-96	—	39	38	—	0%
6-19-96	—	39	38	—	0%
6-20-96	*Microtus californicus stephensi* *Reithrodontomys megalotis* *Mus musculus*	39	39	1/A-male 1/A-male 1/A-female	8%
6-21-96	*Reithrodontomys megalotis* *Mus musculus*	39	39	1/A-male 2/SA-female 2/A-male 1/A-female	15%
6-22-96	*Microtus californicus stephensi* *Mus musculus*	39	39	1/A-male 1/A-male 1/A-female	8%
	Totals	**195**	**193**	**12** *M.c. stephensi* (n=2; 17%) *R. megalotis* (n=4: 33%) *M. musculus* (n=6; 50%)	**6%**

Area C: Sherman Live-Trapping Results

In Area C, 17 small mammals were captured during 250 trapnights of effort, for a capture success rate of 6.8 percent. All capture mammals in Area C were house mice.

Transect: CST-1
Habitat type: Remnant disturbed coastal sage scrub.
Description: Traps placed in an open area supporting California sagebrush, coyote brush, crown daisy (*Chrysanthemum coronarium*), sourclover (*Melilotus indica*), fennel (*Foeneculum vulgare*), everlasting (*Gnaphalium* sp.), foxtail chess, ripgut grass, filaree, slender wild oat, tocolote, telegraph weed, tarweed, and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-16-96	*Mus musculus*	25	25	1/A-male 1/SA-male 1/A-female	12%
4-17-96	—	25	25	—	0%
4-18-96	—	25	25	—	0%
4-19-96	—	25	25	—	0%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1 (cont.)					
4-20-96	*Mus musculus*	25	25	1/A-male 1/SA-male 1/A-female 1/SA-female	16%
	Subtotals	125	125	7 *M. musculus* (n=7; 100%)	6%
Phase 2 (CST-1)					
6-18-96	—	25	25	—	0%
6-19-96	—	25	25	—	0%
6-20-96	*Mus musculus*	25	25	2/SA-male 1/SA-female	6%
6-21-96	*Mus musculus*	25	25	1/A-male 1/SA-female	8%
6-22-96	*Mus musculus*	25	25	1/A-male 3/SA-male 1/SA-female	20%
	Subtotals	125	125	10 *M. musculus* (n=10; 100%)	8%
Two-Phase Trapping Summary					
	Totals	250	250	17 *M. musculus* (n=17; 100%)	7%

Pitfall Trapping Program Results

Only one small mammal was captured during the pitfall trapping effort. A single Botta's pocket gopher was trapped in Area B. The locations and numbers of pitfall trapnights are described in tabular format on the following pages.

Area A: Pitfall Trapping Results

Transect Number: APF-1
General Habitat Type: Stands of pickleweed with small open sandy flats (without tidal influence), patches of non-native annual grassland and coyote brush scrub.
Description: Pitfall trapping array placed in a sandy depression area dominated by moderately dense stands of pickleweed with scattered upland areas comprised of brome grasses, Mediterranean grass (*Schismus barbatus*), scattered coyote brush, and iceplant.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-17-96	—	10	10	—	0%
4-18-96	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Subtotals	40	40		0%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (APF-1)					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	—	10	10	—	0%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Subtotals	50	50		0%
Two-Phase Trapping Summary					
	Totals	90	90		0%

Transect: APF-2
Habitat type: Scattered open salt flats with stands of pickleweed (without tidal influence) and patches of non-native annual grassland.
Description: Pitfall trapping array placed in a saline depression dominated by pickleweed with scattered upland areas comprised of brome grasses and vulpia (*Vulpia* sp.).

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-16-96	—	10	10	—	0%
4-17-96	—	10	10	—	0%
4-18-96	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Subtotals	50	50		0%
Phase 2 (APF-2)					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	—	10	10	—	0%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Subtotals	50	50		0%
Two-Phase Trapping Summary					
	Totals	100	100		0%

Area B: Pitfall Trapping Results

Transect: BPF-1
General Habitat type: Pickleweed bordering salt flats.
Description: Pitfall trapping array placed in salt flats with pickleweed, alkali heath (*Frankenia salina*), alkali weed, with scattered upland areas comprised of brome grasses, Mediterranean grass, and bassia.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-16-96	—	10	10	—	0%
4-17-96	—	10	10	—	0%
4-18-96	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Subtotals	50	50		0%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (BPF-1)					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	*Thomomys bottae*	10	10	1/SA-female	10%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Subtotals	50	50	1 *T. bottae* (n=1; 100%)	2%
Two-Phase Trapping Summary					
	Totals	100	100	1 *T. bottae* (n=1; 100%)	1%

Transect: BPF-2
General Habitat type: Tidal pickleweed flats.
Description: Pitfall trapping array placed in pickleweed flats with pickleweed, saltgrass, alkali heath, fleshy jaumea (*Jaumea carnosa*), with slightly raised areas supporting iceplant and brome grasses.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1 only					
4-16-96	—	10	10	—	0%
4-17-96	—	10	10	—	0%
4-18-96	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Totals	50	50		0%

Transect: BPF-3
General Habitat type: Remnant coastal dune.
Description: Traps placed in coastal dune habitat comprised of sand verbena, croton, dune buckwheat, bush lupine, beach evening primrose, suffretescent wallflower, foxtail chess, ripgut grass, filaree, slender wild oat, iceplant, telegraph weed, stephanomeria, and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-17-96	—	10	10	—	0%
4-18-96	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Subtotals	40	40		0%
Phase 2 (BPF-3)					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	—	10	10	—	0%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Subtotals	50	50		0%
Two-Phase Trapping Summary					
	Totals	90	90		0%

Transect: BPF-4
Habitat type: Seasonal wet pickleweed flats.
Description: Pitfall trapping array placed in seasonally wet pickleweed flats with pickleweed, saltgrass, iceplant, Australian saltbush, ryegrass, beard grass and brome grasses.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-16-96	—	10	10	—	0%
4-17-96	—	10	10	—	0%
—	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Subtotals	50	50		0%
Phase 2 (BPF-4)					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	—	10	10	—	0%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Subtotals	50	50		0%
Two-Phase Trapping Summary					
	Totals	100	100		0%

Transect: BPF-5
Habitat type: Sandy alluvial fan.
Description: Traps placed in a depositional sandy fan from the Hasting's Canyon drainage. Vegetation is comprised of California broom , croton, castor bean, pampas grass, tree tobacco, coyote brush, California sagebrush, horseweed, foxtail chess, ripgut grass, filaree, slender wild oat, telegraph weed, black mustard, wild radish, and Russian thistle.

Date	Species	Number of Trapnights	Effective Number of Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1 only					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	—	10	10	—	0%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Totals	50	50		0%

Area C: Pitfall Trapping Results

Transect: CFP-1
Habitat type: Remnant open coastal sage scrub-disturbed.
Description: Pitfall traps placed in an open area supporting open California sagebrush, coyote brush, crown daisy, sourclover, fennel, foxtail chess, ripgut grass, filaree, slender wild oat, tocolote, telegraph weed, tarweed, and black mustard.

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 1					
4-16-96	—	10	10	—	0%
4-17-96	—	10	10	—	0%
4-18-96	—	10	10	—	0%
4-19-96	—	10	10	—	0%
4-20-96	—	10	10	—	0%
	Subtotals	50	50		0%

Date	Species	Number of Trapnights	Number of Effective Trapnights*	Number of Animals/ Age-Sex**	Daily Capture %***
Phase 2 (CPF-1)					
6-18-96	—	10	10	—	0%
6-19-96	—	10	10	—	0%
6-20-96	—	10	10	—	0%
6-21-96	—	10	10	—	0%
6-22-96	—	10	10	—	0%
	Subtotals	50	50		0%
Two-Phase Trapping Summary					
	Totals	100	100		0%

4.1.2 *Scent Stations*

Results from monitoring the five scent stations over a two-night period are presented in tabular format below. Red fox, striped skunk, domestic cats and domestic dogs were attracted to the bait. Desert cottontail, house mice, and rats were also recorded.

Scent Station - A4

Date	SPECIES	COMMON NAME
1-8-96	*Sylvilagus audubonii*	Desert cottontail
	Felis cattus	Domestic cat
	Mephitis mephitis	Striped skunk
1-9-96	—	—

Scent Station - B1

Date	SPECIES	COMMON NAME
1-8-96	—	—
1-9-96	*Canis familiaris*	Domestic dog
		Disturbed by humans

Scent Station - B2

Date	SPECIES	COMMON NAME
1-8-96	*Mus musculus*	House mouse
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Rattus sp.	Black or Norway rat
	Vulpes vulpes	Red fox

Scent Station - B5

Date	SPECIES	COMMON NAME
1-8-96	*Callipepla californica*	California quail
	Felis cattus	Domestic cat
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Canis familiaris	Domestic dog
	—	bike tracks

Scent Station - C3

Date	SPECIES	COMMON NAME
1-8-96	*Canis familiaris*	Domestic dog
	Sceloporus occidentalis	Western fence lizard
1-9-96	—	—

4.1.3 *Spotlight Surveys*

Spotlight Surveys

Results of spotlight surveys are presented in tabular format below. The most commonly observed mammals were desert cottontail and domestic cat. Dogs, Virginia opossum, and striped skunk were also observed during the surveys.

Area A

Date	SPECIES	COMMON NAME
1-8-96	*Sylvilagus audubonii*	Desert cottontail
	Zenaida macroura	Mourning dove
	Mus musculus	House mouse
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Felis cattus	Domestic cat

Area B

Date	SPECIES	COMMON NAME
1-8-96	*Felis cattus*	Domestic cat
	Charadrius vociferus	Killdeer
	Larus occidentalis	Western gull
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Felis cattus	Domestic cat
	Didelphis virginiana	Virginia opossum
	Rattus norvegicus	*Norway rat*

Area C

Date	SPECIES	COMMON NAME
1-8-96	*Felis cattus*	Domestic cat
	Sylvilagus audubonii	Desert cottontail
	Zenaida macroura	Mourning dove
	Charadrius vociferus	Killdeer
	Mus musculus	House mouse
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Canis familiaris	Domestic dog
	Felis cattus	Domestic cat
	Mephitus mephitus	Striped skunk
	Tyto alba	Barn owl

Area D

Date	SPECIES	COMMON NAME
7-19-96	*Sylvilagus audubonii*	Desert cottontail
	Felis cattus	Domestic cat

4.1.4 *Track Stations*

Results from monitoring the three track stations over a two-night period are presented in tabular format below. Desert cottontail, domestic cats and domestic dogs were recorded.

Track Station - A3

Date	SPECIES	COMMON NAME
1-9-96	—	—
1-10-96	*Sylvilagus audubonii*	Desert cottontail

Track Station - B1

Date	SPECIES	COMMON NAME
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Callipepla californica	California quail
1-10-96	—	—

Track Station - C2

Date	SPECIES	COMMON NAME
1-9-96	*Sylvilagus audubonii*	Desert cottontail
	Felis cattus	Domestic cat
1-10-96	*Sylvilagus audubonii*	Desert cottontail
		Unidentified bird
	Canis familiaris	Domestic dog

4.1.5 *Infrared Camera Station*

No mammals were documented at the camera station, as shown

Camera Station - B1

Date	SPECIES	COMMON NAME
1-8-96	None recorded	—
1-9-96	None recorded	—

4.1.6 *Bat Investigation*

No bats were documented roosting in the buildings and facilities in Area D. No evidence of roosting bats such as guano or staining was observed. In addition, no bats or their sign were recorded under the accessible portions of bridges directly examined. No bats were detected foraging over the open wetlands and salt marsh, or emerging from buildings or underneath bridges. While listening for bats in Area D, a high frequency echo-location was picked up. This call did not appear to be a foraging call, was heard once for a brief instant, and as such was likely made by a transiting bat such as a myotis or western pipistrelle

4.2 Sensitive Mammal Species

Mammal species that are classified as Endangered or Threatened, have been proposed for listing as endangered or threatened, have been designated as candidate species for listing by federal or state resource agencies, or are considered federal species of concern are considered sensitive. In addition, mammalian California Species of Special Concern, Special Animals, and Fully Protected mammals in the State of California are also considered sensitive.

Several sensitive mammal species either occur or have the potential for occurrence on the Project site, based on current and previous biological surveys, historic occurrence records, habitat preference, and geographical location of the project in relation to known species ranges. Sensitive mammal species directly observed or expected to occur on the Project site are included in **Table 2** and discussed in detail below.

Table 2
Sensitive Mammal Species Potentially Occurring at the Project Site

Common Name	Scientific Name	Sensitivity	Habitat	Occurrence Potential
MAMMALS				
Southern California Salt Marsh Shrew	*Sorex ornatus salicornicus*	FSC, CSC	Salt marshes	High
California Leaf-nosed Bat	*Macrotus californicus*	FSC, CSC	Tunnels, caves, buildings, bridges, rocky terrain	Low
Small-footed Myotis	*Myotis ciliolabrum*	FSC, CSC	Caves, buildings, mines, crevices	Low
Long-eared Myotis	*Myotis evotis*	FSC, CSC	Buildings, caves, crevices	Low
Fringed Myotis	*Myotis thysanodes*	FSC, CSC	Caves, mines, buildings, crevices	Low
Long-legged Myotis	*Myotis volans*	FSC, CSC	Rock crevices, buildings, caves, trees	Low
Yuma Myotis	*Myotis yumanensis*	FSC, SA	Buildings, mines, caves, crevices	Moderate
Spotted Bat	*Euderma maculatum*	FSC, CSC	Rock crevices, cliffs	Low
Pale Townsend's Big-eared Bat	*Plecotus townsendii pallescens*	FSC, CSC	Caves, mines, tunnels, human-made structures	Low
Pallid Bat	*Antrozous pallidus*	CSC	Caves, crevices, mines, hollow trees, buildings	Moderate
Pocketed Free-tailed Bat	*Nyctinomops femorosaccus*	CSC	Rock crevices, caverns, buildings	Low
Big Free-tailed Bat	*Nyctinomops macrotis*	FSC, CSC	Crevices, high cliffs, rock outcrops	Low
Greater Western Mastiff Bat	*Eumops perotis californicus*	FSC, CSC	Cliff crevices, high buildings, trees, tunnels	Low
San Diego Black-tailed Jackrabbit	*Lepus californicus bennettii*	FSC, CSC	Coastal sage scrub, ruderal habitats	High
Los Angeles Pocket Mouse	*Perognathus longimembris brevinasus*	FSC, CSC	desert riparian, desert scrub, coastal scrub	Low

Table 2 (cont.)
Sensitive Mammal Species Potentially Occurring at the Project Site

Common Name	Scientific Name	Sensitivity	Habitat	Occurrence Potential
Pacific Pocket Mouse	*Perognathus longimembris pacificus*	FE, CSC	Coastal sage scrub with sandy substrates	Low
Southern Grasshopper Mouse	*Onychomys torridus ramona*	FSC, CSC	Arid areas, coastal sage scrub, chaparral	Low
San Diego Desert Woodrat	*Neotoma lepida intermedia*	FSC, CSC	Coastal sage scrub, chaparral	Low
Stephen's California Vole	*Microtus californicus stephensi*	FSC, CSC	Coastal salt marshes	Present
American Badger	*Taxidea taxus*	CSC	Grassland, oak woodland/savannah	Low

One sensitive mammal species was observed on the Project site during the 1996 field surveys: Stephens' vole. This sensitive taxon as well as others likely still occurring at the Project site are discussed first below, followed by a discussion of several additional sensitive mammal species which potentially occur on the site. Expectations of occurrence are based on individual habitat requirements and documented distribution of each species.

Sensitive Species Known to Occur Recently

Southern California Salt Marsh Shrew (*Sorex ornatus salicornicus*) – The Southern California salt marsh shrew is a Federal Species of Concern and a California Species of Special Concern. It is subspecifically endemic to coastal wetlands and marshes from Point Mugu to Newport Beach. This shrew feeds on adult insects and their larvae and pupae. This taxon was recorded as recently as 1990, and had also been captured in 1980-1981 at the Project site by LACM biologists.

During a 1990 entomological study, a specimen was captured in a pitfall trap from Area B along the western base of the bluffs. This specimen is in the LACM collection, but the collection date is noted as 28 February 1991 when in fact the specimen was likely captured in 1990. No shrews were captured during focused trapping efforts conducted in apparently high quality habitat during June 1991 (Mr. J. Maldonado, personal communication, UCLA). A single specimen was captured during the LACM study, also in an entomological study pitfall trap. There are several museum records from and near the Project site.

No Southern California salt marsh shrews were captured during extensive pitfall trapping efforts conducted by Impact Sciences, Inc. in 1996. However, this taxon has a high occurrence potential (albeit in extremely low numbers) due to recent occurrence records (1981 and 1990), and the presence of suitable habitat. Southern California salt marsh shrew habitat is shown in **Figure 4**.

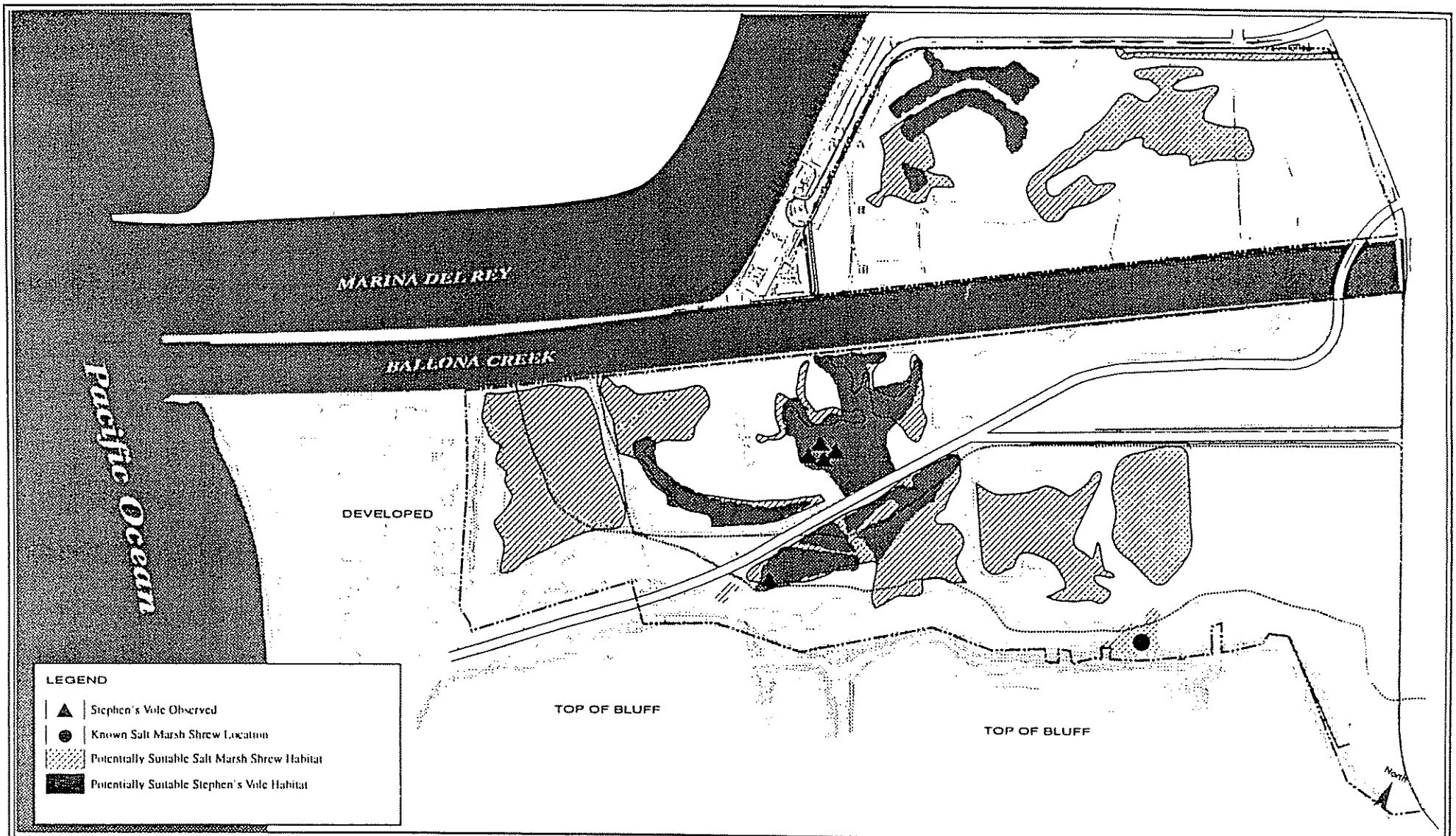
San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*) -- The San Diego black-tailed jackrabbit is a Federal Species of Concern and a California Species of Special Concern that occurs in relatively open sage scrub, chaparral, and non-native annual grassland habitats in the coastal and inland areas of California from approximately Santa Barbara to Baja California, Mexico. The species uses shrubs for cover and prefers grasses and forbs as food. Despite focused attempts to locate this species in Areas A, B, and C, none was detected by Impact Sciences, Inc. in 1996. However, San Diego black-tailed jackrabbits are known to occur at the Project site, primarily in Area D where they occur immediately south of the MTP office building (at the southeast corner of Jefferson Boulevard and Lincoln Boulevard), typically associated with an old rubble pile. This taxon has also been infrequently observed to the west, just across Lincoln Boulevard. As such, this species may infrequently occur in areas located outside of Area D.

Stephens' California Vole (*Microtus californicus stephensi*) – Stephens' California vole is a Federal Species of Concern and a California Species of Special Concern. It is endemic to coastal salt marshes of Southern California, occurring only from Point Mugu to Sunset Beach. The type locality is Playa del Rey. Saltgrass is used as a major food source by this species. Although this species is primarily granivorous, individuals appear to utilize pickleweed as well. As such, this species generally occurs in upland meadows and grassy places where burrowing is possible, but also in areas subjected to daily high tides. This vole swims well, sometimes up to 20 feet, and has remained submerged for up to 20 seconds, and stays in its home range even when flooded, by swimming until the high tides subside. As such, this species will build its nest on the soil surface, irrelevant of tidal height.

Two Stephens' California voles were captured during the 1990-1991 study. One was taken in Area A in pickleweed, and the other in Area B along the bluff. During the 1980-1981 LACM study, three voles were captured, all in Area B. Stephens' vole habitat is shown in **Figure 4**.

This sensitive taxon was captured in low numbers (14 of 324 animals captured, 4.3 percent of the total) during extensive trapping efforts conducted by Impact Sciences, Inc. in 1996. Habitats within which this vole were captured include remnant coastal sage scrub adjacent to non-tidal stands of pickleweed, as well as within patches of seasonally wet pickleweed located adjacent to Centinela Creek.

Western harvest mice (*Reithrodontomys megalotis*) were commonly captured during the trapping effort, accounting for 43 of the 324 captures (13.3 percent). These mice were considered to be salt marsh endemic subspecies, but work conducted by Collins and George (1990) concluded that the sensitive taxon (*Reithrodontomys megalotis limicola*) were best assigned to a more widespread subspecies (*Reithrodontomys megalotis longicaudus*).



Playa Vista EIS/EIR
Affected Environment
Vol. II

Planning Consultants Research

FIGURE 4

SOUTHERN CALIFORNIA SALT MARSH SHREW & STEPHEN'S VOLE HABITAT

Source: Impact Sciences, Inc., 6/96

Sensitive Species Potentially Occurring

Small-footed Myotis (*Myotis ciliolabrum*) -- The small-footed myotis is a Federal Species of Concern that is common in the arid woodlands and brushy uplands of California, primarily near water. Along the coast, this species occurs from Contra Costa County south to the Mexican border. It roosts in caves, buildings, mines, crevices, bridges, and the underside of tree bark. Humid roost sites are preferred. This species requires water, and is often seen to drink soon after emergence. Based on recent surveys in Southern California which indicate that this species is widely distributed, it is considered to have a low potential of occurrence on the Project site.

Long-eared Myotis (*Myotis evotis*) -- The long-eared myotis is a Federal Species of Concern that occurs uncommonly in nearly all brush, woodland and forest habitats in California from sea level to 9,000 feet. Coniferous woodlands and forests seem to be preferred. This bat species roosts in buildings, crevices, spaces under tree bark, and in snags. The species feeds along habitat edges, in open habitats, and over water, preferring beetles and other insects. Based on recent surveys in Southern California which indicate that this species is widely distributed, it is considered to have a low potential of occurrence on the Project site.

Fringed Myotis (*Myotis thysanodes*) -- The fringed myotis is a small bat that is a Federal Species of Concern. It ranges throughout California, except in the Central Valley and Colorado and Mojave Deserts. This species typically occurs in oak woodland, pinyon woodland, juniper woodland, and desert scrub habitats. It forages over water and open habitats where it feeds primarily on beetles, spiders, and moths. The fringed myotis roosts in caves, mines, buildings, and rock crevices. Based on recent surveys in Southern California which indicate that this species is widely distributed, it is considered to have a low potential of occurrence on the Project site.

Long-legged Myotis (*Myotis volans*) -- The long-legged myotis is a Federal Species of Concern that is most common in woodland and forest habitats above 4,000 feet. It occurs primarily in the coastal ranges from Oregon to Mexico, the Cascade/Sierra Nevada ranges, the Great Basin, and in several Mojave Desert mountain ranges. It also forages in chaparral and coastal sage scrub habitats. This species is an aerial forager, feeding primarily on moths. It feeds low to the ground over water, close to trees and cliffs, and in woodland openings. It roosts in rock crevices, buildings, under tree bark, snags, mines, and caves. Based on recent surveys in Southern California which indicate that this species is widely distributed, it is considered to have a low potential of occurrence on the Project site.

Yuma Myotis (*Myotis yumanensis*) -- The Yuma myotis is a small bat that is a Federal Species of Concern. It is widespread in California, occurring in most regions of the state except the Mojave and Colorado Desert regions where it is uncommon. Optimal habitats are open forests and woodlands with bodies of water over which to feed. This species typically roosts in buildings, mines, caves, or crevices, and often under bridges. It is considered to have a moderate potential for occurrence on the Project site due to its widespread distribution in California and the presence of suitable foraging habitat.

Spotted Bat (*Euderma maculatum*) -- The spotted bat is a Federal Species of Concern and a California Species of Special Concern. It ranges in California from the foothills, mountains, and deserts of the central part of the state to Mexico. It inhabits high cliffs, arid deserts, and open pine forests in rough rocky terrain. It prefers to roost in rock crevices, and occasionally in caves and buildings. This species is considered to have a low potential to occur on the site due to the paucity of appropriate habitat factors known to support this species, and its general rarity.

Pale Townsend's Big-eared Bat (*Plecotus townsendii pallescens*) -- The pale Townsend's big-eared bat is a Federal Species of Concern and a California Species of Special Concern. The range of the pale Townsend's big-eared bat in California includes most of the state except the humid coastal regions of the northern and central coasts. This species roosts in mines, caves, and old buildings, and occupies a wide variety of habitats including coastal conifer and broad-leaf forests, high elevation forests and meadows, oak woodlands, arid grasslands, and deserts. Preferred habitat must include roosting, maternity, and hibernation sites away from human disturbance. A single visit by humans can cause the bats to abandon a roost. This species has a low potential for occurrence due to the overall lack of suitable habitat to support this sensitive taxon.

Pocketed Free-tailed Bat (*Nyctinomops femorasaccusi*) -- The pocketed free-tailed bat is a California Species of Special Concern that is known to occur in the extreme southern portions of the state (Riverside, San Diego, and Imperial counties). It is rarely observed in the state, but is more common in Mexico. Preferred habitats include pinyon-juniper woodlands, desert scrub, desert succulent scrub, desert riparian, desert wash, alkali desert scrub, Joshua tree, and palm oasis. Moths are the principal food of this bat species. It prefers rock crevices in cliffs as roosting sites. This species has a low potential for occurrence due to the overall lack of suitable habitat, and the geographic location of the Project site is located outside the species current range.

Big Free-tailed Bat (*Nyctinomops macrotis*) -- The big free-tailed bat is a Federal Species of Concern and a California Species of Special Concern that is known only from a few records in San Diego County. The species is not expected to breed in California, occurring in the state primarily as fall and winter vagrants. It prefers pinyon juniper and arid habitats. It feeds primarily on moths and roosts in high cliffs or rock outcrops. This species has a low potential for occurrence due to lack of suitable habitat, and the geographic location of the Project site is located outside the species current range.

Pallid Bat (*Antrozous pallidus*) -- The pallid bat is a California Species of Special Concern which generally inhabits open, lowland areas below 2,000 feet in elevation throughout most of the state. It occurs fairly commonly in a wide variety of habitats, including grasslands, shrublands, woodlands, and forests from sea level up through mixed conifer forests. These bats commonly roost in rock crevices, caves, and beneath rock slabs. Due to the presence of suitable foraging habitat on the Project site and the geographic range of the animal, this species is considered to have a moderate potential to occur.

Greater Western Mastiff Bat (*Eumops perotis californicus*) -- The greater western mastiff bat is a Federal Species of Concern and a California Species of Special Concern. It ranges from central California to central Mexico. It occurs in open shrub, chaparral, and grassland habitats, cultivated fields, and chaparral/oak interfaces. The species prefers rugged, rocky areas within these habitat types with suitable crevices and exfoliated rock surfaces for day-roosts. They also roost in buildings. Roosts are at least 15 feet above ground due to this large bat's requirement of a vertical drop of several feet during take-off. Due to the lack of potential roost locations, this species has a low occurrence potential, although it could forage over the Project site.

California Leaf-nosed Bat (*Macrotus californicus californicus*) -- The California leaf-nosed bat is a Federal Species of Concern and a California Species of Special Concern. It ranges throughout the extreme southern portion of inland California. It prefers desert wash, desert scrub, and desert riparian habitats where it feeds on a variety of insect species. Day roosts usually are in deep mine tunnels or caves, and occasionally in buildings or bridges. These bats often occur in large groups. This species has a low potential for occurrence due to lack of suitable habitat, and the geographic location of the Project site is located outside the species current range.

Southern Grasshopper Mouse (*Onychomys torridus ramona*) -- The southern grasshopper mouse is a Federal Species of Concern and a California Species of Special Concern. It typically occurs in relatively open areas with a well-developed herbaceous cover in low, hot valleys over most of the southern portion of California. This species feeds on arthropods, grasshoppers, beetles, and lizards.

There are no museum records for this taxon from the area No Los Angeles pocket mice were captured during the small mammal trapping effort conducted by Impact Sciences, Inc. in 1996, and none has been captured during previous trapping studies. Based on the results of the trapping program, lack of previous occurrence records, and the poor quality of habitat, this species has a low occurrence potential.

Los Angeles Pocket Mouse (*Perognathus longimembris brevinasus*) – The Los Angeles little pocket mouse is a Federal Species of Concern and a California Species of Special Concern. It is restricted to lower elevation grasslands and coastal sage scrub vegetation more or less within the Los Angeles Basin. This species tends to occur on fine sandy soils in open areas. It is known from the Los Angeles Basin from Burbank and San Fernando to San Bernardino and south to Aguanga. Historically, this subspecies intergraded with the Pacific pocket mouse (see below) in the region of the Project site. There are no museum records for this taxon from the area. No Los Angeles pocket mice were captured during the extensive small mammal trapping effort conducted by Impact Sciences, Inc. in 1996, and none has been captured during previous trapping studies. As such, it has a low occurrence potential.

Pacific Pocket Mouse (*Perognathus longimembris pacificus*) – The Pacific pocket mouse is listed as a federal Endangered species, and is a California Species of Special Concern. This taxon is known to occur in coastal strands, coastal dunes, river alluvium, and coastal sage scrub vegetation on marine terraces in sporadic locations along the Southern California coast, where it is restricted to fine-grained, sandy substrates where seeds can be found and stored (Mearns, 1898; Von Bloeker, 1931). The Marina del Rey/El Segundo area is the type locality for this species. All nine of the published historical localities (from the Marina del Rey/El Segundo area in Los Angeles County south to the Mexican border) for this species are within 2.5 miles of the coast at elevations of 656 feet or less. This species of mouse is ordinarily sedentary, and is able to become torpid (dormant), estivate (summer), or hibernate (winter) in response to adverse environmental conditions such as fluctuations of temperature and rainfall (Ingles, 1965; Federal Register, 1994). This species may remain underground for five months.

As previously mentioned, Pacific pocket mouse inhabit coastal strand, coastal dunes, and coastal sage scrub vegetation growing on marine terraces (Grinnell, 1933; Meserve, 1972; Erickson, 1993; MBA, 1995). Remnant areas of these habitat types are present in the Project site, a type locality for this subspecies. A total of 118 records have been documented between 1918 and 1938 from the Marina del Rey/El Segundo area. Specimens of Pacific pocket mice taken from the sand dunes and sandy substrates of the Playa del Rey and El Segundo areas in the early 1900s include: Hyperion (1918-1931); Palisades del Rey (1931); Playa del Rey (1932-1935); Del Rey Hills, near Loyola University (1935); Del Rey (1935); and the El Segundo area (1937-1938).

No Pacific pocket mice were captured during the extensive small mammal trapping effort conducted by Impact Sciences, Inc. in 1996, which focused on the capture of this taxon (as previously explained). None has been captured since the 1930s. Based on the lack of recent captures and the current degraded condition of habitat in the area, the Pacific pocket mouse is not expected to occur at the Project site.

San Diego Desert Woodrat (*Neotoma lepida intermedia*) -- The San Diego desert woodrat is a Federal Species of Concern and a California Species of Special Concern. It occurs in chaparral, coastal sage scrub, and most desert habitats along the coastal regions from San Luis Obispo to Baja California, Mexico. The bases of rocks, cactus, and crevices are commonly used for nest placement. Nests are typically comprised of sticks and twigs, cactus, and other debris the woodrat gathers. Where water is scarce, prickly pear cactus is used as a water and nutrient source. Suitable nesting sites may limit distribution. There are no museum records for this taxon from the area. No San Diego desert woodrat were captured during the extensive small mammal trapping effort conducted by Impact Sciences, Inc. in 1996, and none has been captured during previous trapping studies. Based on the results of the trapping program, lack of previous occurrence records, and the poor quality of habitat, this species has a low occurrence potential.

American Badger (*Taxidea taxus*) -- The American badger is a California Species of Special Concern. It ranges throughout the state, preferring drier open stages of most shrub, woodland, and herbaceous habitats with loose sandy soils. This carnivorous mammal eats fossorial small mammals and some reptiles and insects. No sign of this species was recorded from the Project site during walk-over field surveys conducted by Impact Sciences, Inc. in 1996. This species is considered to have a low potential for occurrence on the site based on results of both the recent and previous surveys, and the overall lack of suitable habitat.

5.0 DISCUSSION

5.1 Habitat Value

The habitat value and nature of the mammal community on the Project site is reflective of historic and relatively recent disturbances. The alteration of the natural hydrology and tidal flow regime has reduced the habitat quality for several salt marsh obligate small mammals, especially the Southern California salt marsh shrew. This species may still be present, but in very low numbers. Density of the Stephens' vole has also been reduced. The western harvest mouse occurring at the Project site, until 1990 assigned to a salt marsh obligate subspecies but now recognized to be more wide-ranging, appears to still occur in relatively high numbers. The abundance of the introduced house mouse appears to be increasing, as described below.

The data from the small mammal trapping effort at the Project site can be compared with similar data gathered from other estuarine habitats in Southern California. For example, trapping data from the Tijuana River National Marine Estuary in southern San Diego County show roughly equal abundances of house mice and western harvest mice, fewer deer mice, and still fewer voles (Mitchell and Couffer, 1995). These data contrast sharply with those from the current study at the Project site, in that a common and wide ranging species (deer mouse) is no longer present at Playa Vista but fairly common at Tijuana Slough, and that house mice are more abundant than western harvest mice at the Project site. Small mammal trapping conducted at the Bolsa Chica wetlands in Orange County during 1989-1990 indicated that western harvest mice, house mice and wood rats were present (personal communication, Mr. J. Westermeir). No shrews or voles were captured. In pickleweed habitat only western harvest mice were captured, whereas at Playa Vista house mice are present in the margins of pickleweed stands.

The medium-sized mammal community also reflects the disturbed nature of the site and has been substantially affected by the presence of the introduced red fox. The presence of this predator has in turn had a substantial affect on the ecology of ground-nesting birds, amphibians, reptiles, and native small mammals on the Project site. This introduced carnivore has likely displaced the native common gray fox, which is slightly larger but may not be as aggressive. Other common medium-sized mammals include the Virginia opossum and striped skunk, both typical of urban areas with disturbed open space. Those species requiring high quality habitat or large expanses of undisturbed habitat no longer occur.

5.2 Trends in Habitat Value

Based on the comparative small mammal trapping study results, during the past 15 to 25 years there has been a substantial increase in the density of the introduced house mouse. This aggressive species can out-compete and actually displace native fauna, and is likely responsible for reduced numbers of Stephens' vole and the current lack of deer mouse (*Peromyscus maniculatus*) at the Project site. House mice are native to the same areas which many aggressive, introduced weedy plants species originate from. As such, this mouse is successful in a wider range of habitats than many of the native species, likely due to its ability to more fully utilize weedy plants (for example, in ruderal vegetation). With increasing success of the house mouse, a concurrent decrease in density of the native fauna is expected.

A comparison of the small mammal data collected during the LACM study in 1980-1981 and the Impact Sciences, Inc. study in 1996 may support this concept. Unfortunately, the only other study to expend any amount of trapping effort presented no data in the prepared report with which meaningful comparisons could be made to either the previous or subsequent studies (Frank Hovore & Associates, 1991). Caution

must be used in interpreting data gathered at different times due to environmental conditions which can not be controlled (such as the amount of rainfall during that particular year and consequently the amount of available food), and moon phase in which the trapping efforts were conducted (full moon phases tend to depress small mammal activity), as well as differences in methods including the number of consecutive nights over which trapping occurred (capture success tends to increase through the first three to four nights). However, in general, the relative abundance of native versus non-native species can be evaluated through such a comparison of the two studies separated by 15 years for which there are sufficient data.

During the LACM study period, native and non-native species appeared to be equally abundant, as 49.3 percent of captures were native species, while 50.7 percent were non-native. During the 1996 trapping effort, native species accounted for 17.9 percent of captures, while non-natives accounted for 82.1 percent. House mice in 1980-1981 comprised 48 percent of the total captures, while in 1996 they accounted for 80.9 percent. The 1990-1991 study indicated that more house mice were captured than native species, although little specific information is provided relative to numbers. However, based on these data, it appears that the noticeable increase in capture success of house mice between 1980-1981 and 1996 is reflective of an increase in abundance at the Project site, and is not likely an artifact of sampling bias or methodologies. Given that the presence of introduced generalist species tends to indicate lower quality habitat conditions, this increase of house mice supports the concept that the small mammal community present at the Project site, and hence the habitat value itself, has trended and continues to trend towards lower overall quality.

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