BIOLOGICAL ASSESSMENT:
COASTAL SAGE SCRUB AT UNIVERSITY OF CALIFORNIA, LOS ANGELES

Prepared by:

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Chapter 1: INTRODUCTION

The University of California, Los Angeles (UCLA) is located in a highly urban setting, situated on the west side of Los Angeles. Like most of the Los Angeles Basin, the campus has very little remaining native vegetation. However, two areas continue to offer a glimpse of the native habitats that were displaced by the campus, an oak grove associated with Stone Canyon Creek on the grounds of the University Residence, and a patch of coastal sage scrub in the northwest corner of the campus. This biological assessment has been prepared for the coastal sage site as a practical exercise for an upper-division Geography class.

The site is located at the northwestern corner of the campus, which is situated at the southern margin of the Santa Monica Mountains. The site is bounded by Veteran Avenue to the west, Sunset Boulevard and Bellagio Avenue to the north, the Hitch Residential Suites and Parking Lot #11 to the east and campus tennis courts to the south. The site is of a rectangular configuration and covers approximately four acres.

This study describes the flora and fauna of the site, shich includes many native species native to southern California coastal sage scrub. The site currently supports almost 50 native higher plant species, 7 native mammal species, sevearl amphibians and reptiles, 17 species of butterflies and almost 30 resident or migratory bird species. Conservation of these species require active restoration as well as protection from further encroachment. For purposes of this exercies, the overall goal for short and long-term management of this natural habitat is assumed to be the preservation of this natural coastal sage scrub for its intrinsic biological and cultural value for present and future generations.

With a well-crafted restoration and management plant, the site could reach its full potential as an education and reseach area. It has already been used for class exercies in both the Department of Geography and the Department of Biology. Its proximity to campus makes it available for undergraduate education where no other such opportunity exists. The biological assessment herein provides the factual basis for recognizing the natural value of the site both as a local reservoir of biodiversity and an educational resource.

Chapter 2: PHYSICAL DESCRIPTION

Geological Framework

The site and surrounding areas are composed primarily of unconsolidated gravel, sand, silt, and clay (Vogel 1968). Pleistocene deposits which occupy the area immediately south of the Santa Monica Mountains (the Santa Monica Plain) including the UCLA campus were formed from marine sediments when the area was a large bay and from the erosion and reworking of already existing continental sediments. The erosion of alluvium and sand lead to the covering over of Pleistocene sediments during recent geological epochs; flood plains, coalesced alluvial fans (bajadas), and beaches resulted from such geological phenomena on campus and in surrounding areas. The Santa Monica Mountains rising above the consolidated material comprising the coastal plains are composed of a metamorphic, igneous, and basaltic interior core which dates from the Triassic through the Tertiary Periods. Miocene sedimentary rocks flank the Santa Monica Mountains on either side. Tectonic uplift accompanied by folding and faulting occurred in the Santa Monica Mountains, forming the central portion of the transverse ranges associated with the San Andreas Fault system, throughout the Pliocene and the Pleistocene Epochs.

Regionally the site lies within a seismically active area bounded by two important faults in the Santa Monica Fault Zone, which contains the Malibu Coast / Santa Monica / Raymond / Sierra Madre / Cucamonga fault zone and the Newport-Inglewood Fault (UCLA 1989). The campus itself straddles the Santa Monica Fault, which roughly parallels Wilshire Boulevard as it passes through UCLA and surrounding communities. The Santa Monica Fault forms the southern limit of the Santa Monica Mountains and the Transverse Ranges and structurally separates the elevated Northwest Block of the Los Angeles Basin from the Central and Southwest Blocks. Stretching across the coastal plain, northwest to southeast, the Newport-Inglewood Uplift forms the boundary between the two crystalline blocks that comprise the basin floor (Central and Southwest Blocks). This hidden fault in conjunction with the hidden fault zone just north of Palos Verdes form the areas in which most of the oil deposits of the Los Angeles Basin have been found (Vogel 1968).

Landforms and Soils

There are four landform features of the UCLA campus which existed prior to the construction of UCLA. They consist of the West Fan, the alluvial plain with its axis parallel to Veteran Avenue; the Central Fan, the plain that disjoins the two upland regions of the campus;

the West Terrace which contains the site, the dissected hilly area between the West Fan and Central Fan; and the East Terrace, the rolling upland area east of the Central Fan. The West Terrace, which along with the East Terrace has more than one terrace level, is of primary concern to us here because it contains the site that is our focus in this biological assessment.

The West Terrace

The greater stream dissection, greater local relief and soil characteristics of the West Terrace resembled the Santa Monica Mountains more so than did the other undulating to rolling uplands of campus and the Santa Monica Plain. The West Terrace acts as a transition zone between two landform types, the Santa Monica Mountains above and the Santa Monica Plain below, as much as it is a class in itself.

Prior to human modification, the West Terrace had a maximum elevation of 575 feet, a local relief of 200 feet, a narrow expanse of level summit, and a surface area of approximately 4,000,000 square feet. The northwest to southeast axis had a convex with an eight percent slope which was in actuality divided into regions ranging from 1–18% in slope and 125–510 feet in length. In other portions of the West Terrace, excluding arroyo banks, slopes ranged from 8–35% and from 130–410 feet in length. Concave and convex slopes were present throughout the sight and many of these slopes were nearly linear. In the middle of the 1920s Pleasanton loam was present on the West Terrace below 500 feet, which includes most of the sloping land, and still exists in a degraded form today. Elevations greater than 500 feet, primarily summit land, may once have had the soil type Altamont loam of the residual soil group (Vogel 1968).

Altamont loam is characterized by top soil that is 8–12 inches thick, light brown to dark brown in color and that is lightly textured due to the presence of interbeeded sandstone in parent material. Subsoil on the West Terrace is brown to reddish in color and ranges in thickness from a few inches to five feet and has been known to provide good drainage. Hard Shale and soft sandstone of the Modelo formation which occupies the Santa Monica Mountains is the parent material (bedrock) for the soil of the West Terrace. The soils map from the 1919 soil survey (Nelson 1919) shows that Altamont loam at that time occupied the site, the West Terrace, and the lower slopes of the Santa Monica Mountains. There are those who question the existence of Altamont Loam on the campus because the similarity of Altamont loam to Pleasanton loam makes identification of the former very difficult and because only Pleasanton loam has existed on the West Terrace since the 1940s (Vogel 1968).

Soil Tests

The type of soil, as well as the mineral content of soils, are conditions that play important roles in determining what types of vegetation will grow in a certain area. Among the major minerals that are required in relatively large amounts for a rich, healthy soil are nitrogen, potassium, and phosphorous. Tests were conducted on 15 soil samples from locations chosen randomly on the site to determine the abundance of these minerals.

All samples contained only traces or very low levels of nitrogen. The phosphorous tests yielded results that showed only low levels, and in some cases medium levels. Potassium tests indicated that the samples had in most cases medium to high levels (Table 1).

Soils are also composed, in part, of various organic materials. These include leaves, branches, fruits that have fallen from trees, remains of animals, and fallen trees and shrubs. All of these materials decay over time and release their nutrients into the soil, and thus have beneficial effects by adding to the richness of soil. Samples were tested for organic content, the highest level being 4%, and most samples contained about 3.5%. The soil samples all indicated pH levels of 7 or 8.

Table 1. Results of soil tests

Sample Number	Nitrogen	Potassium	pH	Organic material	Phosphorus
1	low	med/high	8	3.5%	low
2	trace	low	8	3.5%	low
3	trace	medium	8	3.5%	low
4	trace	med/low	8	3.5%	low/med
5	trace	med/high	8	3.5%	low
6	trace	very high	8	3.5%	low
7	trace	very high	7	3.5%	low
8	trace	med/high	8	2.5–3.0%	low
9	low	very high	8	3.5%	low
10	trace	low	8	3.5%	low
11	trace	med/low	8	2.5–4.0%	low
12	trace	very high	7	2.5%	medium
13	trace	high	8	3.5%	low
14	trace	very high	8	2.5–4.0%	medium
15	trace	very high	8	3.5%	low

Slope, Erosion, and Runoff

While factors such as soil type and vegetation patterns of a particular area play large roles in determining the extent of runoff and erosion that will occur, the slope of an area also has a profound effect on these events. The slope of the site varies from 2–9% throughout the 4 acres. No formal tests were conducted to determine the quantitative effects of runoff and erosion.

Chapter 3: FLORA

History

Prior to the construction of UCLA the West Terrace and the East Arroyo were occupied by coastal sage scrub. On the site this association is characterized by a fairly continuous ground cover of small brushy shrubs with a few taller shrubs, primarily laurel sumac (*Malosma laurina*), scattered among the smaller ones. Twenty three species of shrubs which dominated the coastal sage scrub association of the West Terrace prior to large-scale human modification have been listed by Vogel as follows:

Artemisia californica, California sagebrush (abundant);
Baccharis viminea, mule fat;
Datura meteloides, Jimson weed;
Encelia californica, California encelia or bush sunflower;
Eriogonum cinereum, white buckwheat;
Eriogonum fasciculatum, California buckwheat;
Galium angustifolium, Chaparral bedstraw;
Galium nuttallii, Nutall bedstraw;
Gutierrezia spp., snakewood or matchweed;
Haplopappus palmeri, Palmer goldenbrush;
Lonicera subspicata, southern honeysuckle;
Lotus scoparius, deerweed;
Malacothamnus [=*Malvastrum*)] *fasciculatus*, bush mallow;
Mimulus [=*Diplacus*] *longiflorus*, bush monkeyflower (abundant);
Nicotiana glauca, tree tobacco (naturalized);
Opuntia occidentalis, prickly pear cactus;
Ribes speciosum, fuchsia-flowered gooseberry;
Rhus laurina, laurel sumac (abundant);
Salvia apiana, white sage (abundant);
Salvia leucophylla, purple sage;
Salvia mellifera, balck sage (abundant);
Yucca whipplei, chaparral yucca; and
Zauschneria californica, California fuchsia.

Numerous species of herbs and grasses are also intermingled among the dominant shrubs of the coastal sage scrub association and were dominant on the site and crests of the West Terrace. Among the more common herbs on the site were *Calochortus* species (Mariposa-lily),

Dodecatheon clevelandii (shooting star) and *Marah macrocarpa* (wild cucumber). Among the prevalent native grasses, mostly bunch grasses, were *Bromus carinatus* (California brome grass), *Elymus condensatus* (giant rye grass), *Festuca megalura* (foxtail fescue), *Melica imperfecta* (California melie), *Stipa* [=*Nassella*] *lepida* (foothill needlegrass) and *Stipa pulchra* (purple needlegrass).

While the West Terrace was not cultivated prior to development of the campus it was used for grazing livestock, thus leading to the introduction of several alien grasses into the area. Vogel identified a list of 13 naturalized grasses which may have been present on the site, including *Avena* and *Hordeum*, at the time construction of the campus commenced, the most predominant species which are known to have been on the West Terrace are as follows:

Bromus spp., four species of brome;
Cynodon dactylon, Bermuda grass;
Digitaria sanguinalis, hairy crabgrass;
Echinochola crusgalli, watergrass;
Lamarckia aurea, golden tap;
Lolium multiflorum, Italian rye grass;
Poa annua, annual bluegrass; and
Polypogon monspeliensis, beard grass.

Vegetation Survey

A survey of the site was undertaken in the winter of 1996 to assess which plant species remain, which species have been competitively excluded and which species have successfully recolonized the area. A control site of protected natural Coastal Sage Scrub in Will Rogers State Park (WRSP) was used to compare vegetation cover and species composition. Three point transects, 25 m long were laid out at WRSP in three different areas of coastal sage scrub. Plant species were recorded every 0.5 m to determine the vegetation cover (see Appendix A). At WRSP, transect #1 was dominated by giant rye grass, California sagebrush and California sunflower. Transect #2 was dominated by Coastal sagebrush and white buckwheat. Transect #3 had a more even distribution and was dominated by black sage, California sunflower and giant rye grass. Total coverage of WRSP was dominated by California sagebrush, giant rye grass and black sage (Appendix B).

To survey the UCLA Site, three different areas were selected based on various degrees of disturbance. The northwestern area was chosen due to its accessibility by the public. Area 2, past the gate, is subject to disturbance of dumping from the Facilities Department. South of this area, a number of old oak trees persist and was chosen due to the low levels of disturbance. The

same methods used at WRSP were used to survey the UCLA Site, complemented by a general survey, collecting plant specimens for identification using standard references (Raven et al. 1994) and by Dr. Barry Prigge at the UCLA Mildred E. Mathias Botanical Garden Herbarium. Transect #1 found a high percentage of grass species and California sagebrush. Transect #2 was dominated by laurel sumac, tree tobacco and castor bean. Transect #3 was dominated by California sagebrush, oak species and needlegrass. The total vegetation coverage showed the dominance of California sagebrush, laurel sumac and various grasses including *Stipa* [=*Nassella*]. Additional plant species collected and/or identified are listed below (Table 2, Table 3).

Table 2. Plant species native to local region classified by family. Species listed with an asterisk are from Scow (1995).

		HISTORICAL	PRESENT
BRYOPHYTES			
ADIANTACEAE			
Pityrogramma triangularis	goldback fern	X	
POLYPODIACEAE			
Polypodium californicum	California polypody	X	
ANGIOSPERMS:	**Monocots**		
AGAVACEAE			
Yucca whipplei	our lord's candle	X	X
AMARYLLIADACEAE			
Bloomeria crocea	yellow star lily	X	
IRIDACEAE			
Sisyrinchium bellum	blue-eyed grass	X	X
JUNCACEAE			
Juncus balticus	wire rush	X	
Juncus bufonius	toad rush	X	
LILIACEAE			
Calochortus spp.	mariposa lily	X	
POACEAE			
Bromus carinatus	California brome grass	X	
Leymus condensatus	giant rye grass	X	X
Festuca megalura	foxtail fescue	X	X
*Melica imperfecta**	California melie	X	
Nassella lepida	foothill needlegrass	X	X
Nassella pulchra	purple needlegrass	X	X
ANGIOSPERMS:	**Dicots**		
ANACARDIACEAE			
Malosma laurina	laurel sumac	X	X
Rhus integrifolia	lemonadeberry		
Rhus ovata	sugar bush		
Toxicodendron diversilobum	poison oak		X
APIACEAE			
Daucus pusillus	rattlesnake weed	X	
ASCLEPIACEAE			
Asclepias eriocarpa	indian milkweed	X	
ASTERACEAE			
Ambrosia psilostachya	western ragweed	X	

Artemisia californica	coastal sagebrush	X	X
Artemisia dracunculus	wild tarragon	X	X
Baccharis pilularis	coyote brush		X
Baccharis silicifolia	mule fat	X	X
Cirsium occidentale	red thistle	X	
Encelia californica	bush sunflower	X	X
Gnaphalium bicolor	two-tone everlasting	X	X
Gnaphalium californica	green everlasting	X	X
Gnaphalium purpureum	purple cudweed	X	
Gutierrezia spp.	snakeweed/matchweed	X	
Ericameria palmeri	palmer goldenbush	X	
Hazardia squarrosa	goldenbush		X
*Hazardia stenolepis**			X
Isocoma menziesii	coastal isocoma	X	X
Heterotheca grandiflora	telegraph weed	X	
Lasthenia chrysostoma	coast goldfield	X	
Malacothrix saxatilis	cliff-aster	X	
Perezia microcephala	perezia	X	
Stephanomeria virgata	wand chicory	X	
Stephanomeria sp.*			X
BORAGINACEAE			
Amsinckia sp.	fiddleneck	X	
CACTACEAE			
Opuntia littoralis	prickly pear		X
O. occidentalis	prickly pear	X	X
CAPRIFOLIACEAE			
Lonicera subspicata	southern honeysuckle	X	
Sambucus mexicana	mexican elderberry	X	X
COVOLULACEAE			
Calystegia macrostegia	morning glory	X	X
CRASSULACEAE			
Dudleya lanceolata	lance leaf liveforever	X	
CUCURBITACEAE			
Marah macrocarpus	wild cucumber	X	X
EUPHORBIACEAE			
Eremocarpus setigerus	turkey mullein	X	
FABACEAE			
Astragulus sp.	milkvetch		X
Astragulus gambelianus	dwarf locoweed	X	X
Lotus scoparius	deer weed	X	X
Lotus strigosus	strigose lotus	X	
Lotus wrangelianus	chile lotus	X	
Lupinus spp.			X
Lupinus bicolor	dove lupine	X	
Lupinus succulentus	arroyo lupine	X	
Trifolium spp.	clover		X
FAGACEAE			
Quercus agrifolia	coast live oak	X	X
HYDROPHYLLACEAE			
Eucrpta chrysamthifolia	eucrypta	X	
JUGLANDACEAE		X	
Juglans californica	black walnut	X	X
LAMIACEAE			
Salvia apiana	white sage	X	
Salvia leucophylla	purple sage	X	

Salvia melliflora	black sage	X	X
Salvia apiana X *leucophylla*	hybrid sage (see Epling 1947)	X	
Trichostema lanatum	woolly blue curls		X
MALVACEAE			
Malacothamnus fasciculatus	bush mallow	X	
ONAGRACEAE			
Zauschneria californica	California fuschia	X	
PAPAVERACEAE			
Eschscholzia californica	California poppy	X	
PLATAGINACEAE			
Plantago erecta	California plantain	X	
PLATANACEAE			
Platanus racemosa	California sycamore	X	X
POLEMONIACEAE			
Linanthus dianthiflorus	ground pink	X	
POLGONACEAE			
Eriogonum cinereum	ashy leaf buckwheat	X	
E. elongatum	silver buckwheat	X	
E. fasciculatum	California buckwheat	X	
PORTULACACEAE			
Calandrinia ciliata	red maids	X	
Claytonia perfoliata	miner's lettuce		X
PRIMULACEAE			
Dodecatheon clevelandii	shooting star	X	
RHAMNACEAE			
Ceanothus spinosus	greenbark		
C. megacarpus	big pod ceanothus		
ROSACEAE			
Cercocarpus betuloides	mountain mahogany		X
Heteromeles arbutifolia	toyon	X	X
Prunus ilicifolia	holly leaved cherry		X
RUBIACEAE			
Galium angustifolium	chaparral bedstraw	X	
G. nuttallii	nuthall bedstraw	X	
SALICACEAE			
Salix laevigata	red willow		X
S. lasiolepis	arroyo willow	X	
SAXIFRAGACEAE			
Ribes speciosum	fuschia-flowered gosseberry	X	X
SCROPHULARIACEAE			
Keckiella ternata	penstemon		X
Mimulus longiflora	bush monkey flower	X	X
Orthocarpus purpurascens	owl's clover	X	
Scrophularia californica	California bee plant	X	
SOLANACEAE			
Datura sp.*			X
D. wrightii	jimson weed	X	
Solanum douglasii	white nightshade	X	X
S. xantii	purple nightshade	X	X
VERBANACEAE			
*Verbena lasiostachys**	vervain	X	X

Table 3. Plant species not native to the local region, both exotic and cultivated, classified by family. Species listed with an asterisk are from Scow (1995).

		HISTORICAL	PRESENT
GYMNOSPERMS			
CUPRESSACEAE			
Juniperus sp.*			P
J. chinensis	**chinese juniper**	**H**	**P**
PINACEAE			
Cedrus deodara	deodar	H (1960s)	P
P. canariensis	canary island pine		P
*P. halepensis**	aleppo pine		P
ANGIOSPERMS	**Monocots**		
CYPERACEAE			
*Cyperus alternifolius**	umbrella plant		P
POACEAE			
Avena spp.	wild oat	H (1960s)	P
Bromus spp.	brome grass	H (1960s)	P
B. diandrus	ripgut		P
*B. inermis**	hungarian brome		P
*B. madritensis**	spanish brome		P
B. wildenovii	fescue grass		P
*Chloris gayana**	rhodes grass	H (1960s)	
Cortaderia sp.	pampas grass		P
Cynodon dactylon	bermuda grass	H (1960s)	
Digitaria sanguinalis	hairy crab grass	H (1960s)	P
Echinochloa crusgalli	water grass	H (1960s)	
Erharta calycina	veldt grass	H (1960s)	P
Hordeum spp.		H (1960s)	
Lamarckia aurea	golden tap	H	
Lolium multiflorum	italian rye grass	H	P
*Phalaris aquatica**	harding grass		P
*Piptatherum miliaceum**	smilo grass		P
Poa annua	annual bluegrass	H	
Polypogon monspeliensis	beard grass	H	
ANGIOSPERMS	**Dicots**		
AIZOACACEAE			
Carpobrotus edulis	hottentot fig (iceplant)	H	P
ANACARDIACEAE			
Schinus terebinthifolius	brazilian pepper tree		P
ANNONACEAE			
*Annona cherimola**	cherimoya		P
APIACEAE			
Foeniculum vulgare	sweet fennel	H	P
APOCYNACEAE			
*Nerium oleander**	oleander		P
Vinca minor	periwinkle		P
ARALIACEAE			
Hedera canariensis	algerian ivy	H	P
H. helix	english ivy	H	P
ARECACEAE			
Washingtonia filifera	California washingtonia		P

ASTERACEAE			
Conyza bonariensis	little horseweed	H	P
C. canadensis	horseweed		P
*Iva axillaris**	poverty weed (cultivar)		P
*Lactuca serriola**	prickly lettuce	H	
Taraxacum officinale	common dandelion	H	P
*Santolina chamaecyparisus**	lavender cotton		P
Senecio vulgaris	common groundsel	H	P
Sonchus oleraceus	sow thistle	H	P
BRASSICACEAE			
Brassica nigra	black mustard		P
Raphinus sativus	wild radish	H	
CHENOPODIACEAE			
*Atriplex semibaccata**	australian saltbush		P
Chenopodium murale	nettle-leaf goosefoot	H	
*Salsola tragus**	russian thistle		P
CISTACEAE			
Cistus sp.			P
Cistus incanus	rock-rose		P
CONVULVULACEAE			
Convulvus arvensis	bindweed	H	P
Crassula ovata	jade		P
EUPHORBIACEAE			
Ricinus communis	castor bean		P
FABACEAE			
Acacia spp.	acacia	H (1960s)	P
A. baileyana	bailey acacia		P
Albizia dichtheum			P
*A. julibrissin**	silk tree	H	P
Cassia corymbosa			P
Ceratonia siliqua	st. john's bread		P
Medicago sp.	clover	H	
FAGACEAE			
Quercus ilex*	holly oak		P
*Q. subra**	cork oak		P
Lithocarpus densiflora	tanbark oak		P
*Q. engelmannii**	engelmann oak		P
*Q. wislizenii**	interior live oak		P
FLACOURTIACEAE			
*Xylosma congestum**			P
GERANIACEAE			
Erodium sp.	filaree	H	P
LAMIACEAE			
Marrubium vulgare	horehound	H	P
Rosemarinus officinalis	rosemary		P
Tucrium fruticana?			P
MALVACEAE			
Malacothamnus fasciculatus	bush mallow		P
Malva parviflora	cheeseweed	H	P
MORACEAE			
Ficus sp.	fig tree	H	
*F. pumila**	creeping fig	H	P
MYOPORACEAE			
Myoporum sp.	myoporum		P

MYRTACEAE			
Eucalyptus spp.	eucalyptus	H	P
*Callistemon citrinus**	lemon bottlebrush	H	P
*Syzigium paniculatum**	australian bush cherry		P
OLEACEAE			
*Olea europaea**	olive tree		P
ONAGRACEAE			
Ludwigia sp.	primrose		P
OXALIDACEAE			
Oxalis sp.	wood-sorrel	H	P
PASSIFLORACEAE			
Passiflora sp.	passion vine		P
PITTOSPORACEAE			
Pittosporum undulatum	victorian box tree		P
PLANTAGINACEAE			
Plantago lanceolata	english plantain	H	P
PLUMBAGINACEAE			
*Plumbago auriculata**	leadwort		P
POLYGONACEAE			
Rumex crispus	curly dock	H	P
PRIMULACEAE			
Anagallis arvensis	scarlet pimpernel	H	P
RHAMNACEAE			
Ceanothus thrysiflorus			P
Rhamnus sp.			P
ROSACEAE			
Cotoneaster parney	brightbead cotoneaster	H	P
Eriobotyra japonica	loquat		P
*Prunus trilobata**			P
*P. caroliniana**	american cherry laurel		P
*P. ilicifolia lyonii**	catalina cherry		P
SOLANACEAE			
Nicotiana glauca	tree tobacco	H	P
ULMANACEAE			
Ulmus parvifolia	chinese elm		P
VERBANACEAE			
Lantana montevidensis	weeping lantana		P
VITACEAE			
Vitis girdiana	wild grape		P

Despite the number and variety of exotic species present on the site, it still remains the only location on the UCLA campus with vegetation representative of coastal sage scrub. The distribution of exotics and natives is patchy, with some areas approaching 100% native cover. The persistence of Stipa grasslands, found in almost pure stands along some of the slopes is remarkable, when virtually all southern California grasslands have been overrun by exotic Eurpean annual grasses. The site represents a significant resource for local plant diversity and an invaluable opportunity to educate about local plant associations.

Chapter 4: FAUNA

Mammals

Mammalian species present at the site and their relative densities were evaluated to construct a plan for the restoration of a habitat suitable for small mammals. The data obtained from the mammal surveys is compared with historical data from Vogel (1968) and similar surveys undertaken in a coastal sage and chaparral habitat at Leo Carrillo State Beach.

History

The site was frequented by many mammal species prior to the construction of the campus. Carnivores such as *Procyon lotor* (raccoon) and *Uroycon cinereoargenteus* (California gray fox) and insectivores such as *Scapanus townsendii* (Townsend mole) frequented Stone Canyon Creek and other riparian zones attributed to the campus and the site. The location of the site on the West Terrace meant that it was frequented by the animals who took advantage of the open spaces created by cultivation during part of the year. Such species included *Lepus californicus* (black-tailed jack rabbit), *Sylvilagus audubonii* (Audubon's cottontail), *Odocoileus hemionus* (mule deer), *Sciurus griseus* (western gray squirrel), *Scapanus* sp. (moles), and *Urocyon* sp. (foxes). In the banks of many of the Arroyos feral dogs dug holes in order to breed their pups and there is evidence that bats (*Myotis* and *Tarida*) may have also been present in the area (Vogel 1968).

These eight resident mammals listed by Vogel (1968) were:

Mustela frentata, Long-tailed weasel;
Mephitis mephitis, striped skunk;
Spilogale gracilis, spotted skunk;
Spermophilus beecheyi, California ground Squirrel;
Thomomys bottae, Botta's pocket gopher;
Chaetodipus spp., pocket mouse;
Peromyscus spp., deer mouse; and
Reithrodontomys megalotis, Western harvest mouse.

Three non-resident carnivores that inhabited the Santa Monica Mountains but which would frequent the site are *Canis latrans* (coyote), *Felis concolor* (mountian lion), and *Lynx rufus* (bobcat) (Vogel 1968).

Mammal Survey

Two transects were set covering much of site area, each consisting of 14–18 Sherman live traps. Two traps were set at each station where there was evidence of small mammal activity. Some of the evidence included very dense brush and twigs with mammal droppings, hair, or track marks on a walkway that mammals used as corridors. The traps were baited with rolled oats for food and a napkin for a small nest inside the traps. Thirty-two traps were used on both nights. The mammals were identified, sexed, and their relative age taken, then released unharmed at the site of capture. Habitat data of the surrounding location were collected where a mammal was captured and then documented with photographs.

The results of trapping efforts can be compared with those from a comprable study carried out in 1994 in the Santa Monica Mountains at Leo Carillo State Beach (see Appendix C). This study was chosen because it had similar trap effort, and was conducted in a coastal sage/chaparral habitat (Maldonado 1994).

The first trapping period had a success rate of 5 mammals trapped from 32 traps, or a 15.6% trap success (2/18/96–2/19/96). The second period caught 2 mammals out of 32 traps, or a 6.25% success rate (3/2/96–3/3/96). The full moon on the second trapping effort could be one possible reason for the lower turnout. The mammals captured at the site are for the most part nocturnal and as Ingles (1965) indicates, small rodents will be less active during periods of a full moon, hence the probablity of capture is reduced.

Table 4. Mammal species found at UCLA coastal sage site.

Scientific Name	Common Name	HISTORICAL	PRESENT
ORDER MARSUPIALIA			
Didelphis virginiana	opossum		X
ORDER INSECTIVORA			
Scapanus townsendii	Townsend mole	X	
ORDER CHIROPTERA			
Myotis spp.		X	
Tarida spp.		X	
ORDER CARNIVORA			
Urocyon cinereoargenteus	california gray fox	X	
Procyon lotor	raccoon	X	?
Mustela frenata	long-tailed weasel	X	
Mephitis mephitis	striped skunk	X	?
Spilogale gracilis	spotted skunk	X	
Canis latrans	coyote	X	X
Felis concolor	mountain lion	X	
Lynx rufus	bobcat	X	
ORDER ARTIODACTYLA			
Odocoileus hemionus	mule deer	X	X
ORDER RODENTIA			
Sciurus griseus	western gray squirrel	X	
Spermophilus beecheyi	California ground squirrel	X	X
Thomomys bottae	Botta's pocket gopher	X	X
Chaetodipus spp.	pocket mouse	X	

Peromyscus spp.	deer mouse	X	
Reithrodontomys megalotis	western harvest mouse	X	
Neotoma fuscipes	dusky-footed woodrat	X	X
Mus musculus	house mouse		X
Rattus norvegicus	norway rat		X
ORDER LAGOMORPHA			
Lepus californicus	black-tailed jack rabbit	X	
Sylvilagus audubonii	Audubon cottontail	X	X

The dusky-footed wood rat (*Neotoma fuscipes*) is a medium-sized wood rat with a grayish brown dorsum and a white or pale venter. The distal is half white, and its feet brown at the base, with a faintly bicolored scantily haired tail, ear pinnae broad, and is moderately hairy. This mammal is generally found amongst dense brush of sumac, California sage, fennel, grass, and twigs. Common nesting places are dense twigs, which enables this rodent to hide from predators that might pose harm to them. Diet consists of varied leaves, nuts, flowers, and berries. The general distribution of the wood rat is in hardwood forests, brush lands, or wherever they can find dense areas to live in. The wood rat is one of the few remnant native rodents at the site. Sufficient brush cover, debris, and branches at the site provides several nest environments. Only two nests were observed, however dense vegetation limited further examination of the site.

A brown or Norway rat (*Rattus norvegicus*), was captured at the site. No members of the genus *Rattus* are native to North America, but were introduced by humans. This brownish rat with coarse and rough fur has a hairless, scaly tail, which makes up 50% of its total body length. The ears are large and also hairless with a gray venter. This rat is considered violent, especially when in danger. The rat will attempt to bite and scratch its way to freedom from intruders who threaten it. This animal is characteristic of disturbed sites and is found among buildings, rice fields, crops, and in wild environments up to approximately 1000 m into the mountains. The brown rat is omnivorous, which likes to eat plants, and is extremely destructive to all sorts of food products. It is a reservoir for plagues, trichina worms, typhus, and some forms of hepatitis. Eradication of the Norway rat is recommended to allow native species such as *Neotoma* and *Peromyscus* to fluorish.

The House Mouse (*Mus musculus*) is another species introduced from Europe and Asia. It is a small, dark brown, long-tailed mouse with a light brown or buff-colored venter. The tail is unicolored and hairless. The house mouse possess three rows of tubercles on their cheek teeth, and have an unpleasant odor unlike that of any native species. These mice are dirty, destructive, and soil what they do not consume. They pollute and destroy foods wherever stored. The house mouse generally inhabits brushy areas up to 2000 m in mountains, underneath plant life, beneath dense grass, the canopy of mule fat, and under some sumac. The house mouse is not

selective in its diet, which can consist of seeds, insects, stored food, and leaves. This is also an animal that will inhabit disturbed sites and should be eradicated.

In addition to the mammals mentioned above, several young Audubon's cottontails (*Sylvilagus audubonii)* and California ground squirrels (*Spermophilus beecheyi)* were also observed during the field study. Mule deer (*Odocoileus hemionus*) were reported and observed on the site on serveral other occasions. Other indirect signs of mammals included remains of a dead opposum (*Didelphis virginiana*) along one of the trails leading to the top of the site, and several pocket gopher burrows, presumably *Thomomys bottae*. Several introduced fox squirrels (*Sciurus niger*) were observed around the grassy areas near the dorms. No evidence of large carnivores such as scats or tracks from coyotes, bobcats, mountain lions or foxes were found. However, in 1991 a coyote (pregnant female) was hit by a car at the intersection of Veteran and Gayley (Maldonado, pers. comm.). This is not far from the site and coyotes are known to disperse relatively long distances. However, the site is not considered large enough to support large carnivores, and this animal was probably a transient from the surrounding hills. There have also been occasional sightings of raccoons (Maldonado, pers. com.) in the nearby areas and on campus. This site could support a generalist such as this animal that can feed on a wide variety of diets but certainly not in high densities.

Domestic dogs and cats also occasionally visit the site. UCLA holds a large population of feral cats that are known to inhabit parking structures and surrounding buildings. These animals can be destructive to native small mammals that fall prey to them, especially if they occur at high densities. Feral cats have been known to completely decimate island bird and mammal faunas when they have been accidentally introduced. In the same way, they can influence the densities of small mammals at the site because of the island effect created by the barriers to disperse mainly by the major avenues surrounding the areas. This fragmentation prevents immigration from other nearby areas and populations of small mammals are effectively isolated.

The trapping data show that this site has a depauperate small mammal fauna. Compared to previous years and to similar habitats, this site shows a reduced number of small mammals and at much lower densities (see Appendix C). This is the effect of habitat fragmentation, development, and degradation that the study site has endured over the past 80 years. Reintroduction of at least two more species of small rodents (i.e., *Peromyscus boylii* and *Reithrodontomys megalotis*) from nearby coastal sage scrub habitats in the Santa Monica Mountains is recommended.

Avifauna

Avifauna are used as an indicator of overall habitat integrity by cataloguing which species are present and then examining which of these are sensitive to habitat quality and degradation. It can be inferred that sensitive species present in a given habitat are good indicators of habitat integrity. By examining changes in species composition and correlating these changes to known physical changes, such as the construction of the university and the clearing of the site in 1962, we can extrapolate which absent species are candidates for reintroduction. This determination is made based on previous presence before anthropogenic habitat alteration. Species formerly not present would not be selected for introduction. According to Loye Miller, author of *Birds of the Campus*, approximately 100 species of birds were most likely present either as residents or migrants prior to the construction of the campus (Miller in Vogel 1968). It is further noted that the site itself contained birds typical of chaparral and/or coastal sage areas; 9 of 13 species historically present on the site are brush loving, and the remaining 4 are typical of forest or grassland.

The species that are present today do give an indication that the site in its current state, although not pristine, is in fact suitable habitat for many species. One such species is the Wrentit (*Chamaea fasciata*). The Wrentit is a sedentary (resident) species whose breeding range requires coastal sage or chaparral habitat (Garrett and Dunn 1981). Other species currently present at the site that also indicate good habitat integrity are the Red-shouldered Hawk (*Buteo lineatus*), Black Phoebe (*Sayornis nigricans*), and Northern Flicker (*Colaptes cafer*).

However, by examining Loye Miller's list of historically present species, we can also note some significant losses, namely the California Quail (*Callipepla californicus*), and the Roadrunner (*Geococcyx californianus*). These species were historically present at the site and most likely remained present until it was cleared in 1962 (Miller 1947). Unfortunately, due to the fact that the site is an isolated habitat fragment surrounded by a suburban sea of Westwood and the UCLA campus, some species such as these with low dispersal ability are not rescued by recolonization from nearby habitats. Another absent species, the Black-headed Grosbeak (*Pheuticus melanocephalus*), would neither be expected to return nor be a good candidate for reintroduction because of the loss of necessary habitat.

In looking at the avifauna data (Table 5), one can easily note the changes in species composition that have occurred over time. Some species formerly present have vanished, and some new ones have taken their place. Species currently present indicate the presence of suitable habitat and the possibility of reintroduction of some species, such as the California Quail, exists, provided habitat restoration takes place. Furthermore, it can be expected that with

at least the conservation and preservation of the site in its current condition, the current species catalogue will remain in place.

Table 5. Bird Species on UCLA West Terrace. Status indicated by R (Resident), S (Spring), W (Winter), or T (Transient). Historical records indicated by H (Historically on West Terrace) or C (Historically on Campus).

Scientific Name	Common Name	Status	HISTORICAL	CURRENT
FALCONIDAE				
Buteo xxxxx	Red-tailed Hawk	R		P
Elanus leucurus	White-tailed Kite	R	H	
Accipiter cooperii	Cooper's Hawk	R	C	P
Accipiter striatus	Sharp-shinned Hawk	W	C	P
PHASIANIDAE				
Callipepla californicus	California Quail	R	H	P
COLUMBIDAE				
Zenaida macroura	Mourning Dove	R	C	P
CUCULIDAE				
Geococcyx californianus	Greater Roadrunner	R	H	
STRIGIDAE				
Bubo virginianus	Great Horned Owl	R	C	P
TROCHILIDAE				
Calypte anna	Anna's Hummingbird	R	C	P
Selasphorus sasin	Allen's Hummingbird	T, R*		P
PICIDAE				
Colaptes cafer	Northern Flicker	R	C	P
TYRANNIDAE				
Sayornis nigricans	Black Phoebe	R	C	P
HIRUNDINIDAE				
Hirundo pyrrhonota	Cliff Swallow	S	C	P
CORVIDAE				
Aphelecoma coerulescens	Western Scrub-Jay	R	H	P
Corvus brachyrhynchos	American Crow	R	C	P
Corvus corax	Raven	R	C	P
PARIDAE				
Parus inornatus	Plain Titmouse	R	C	P
SYLVIIDAE				
Chamaea fasciata	Wrentit	R	C	P
MIMIDAE				
Mimus polyglottos	Northern Mockingbird	R	C	P
AEGITHALIDAE				
Psaltriparus minimus	Bushtit	R	H	P
POLIOPTILIDAE				
Polioptila californica	Western Gnatcatcher	R	H	
TURDIDAE				
Turdus migratorius	American Robin	W	H	P
Pipilo crissalis	California Towhee	R	H	P
Pipilo erythropthalmus	Spotted Towhee	R	C	P
CARDINALIDAE				
Pheuticus melanocephalus	Black-headed Grosbeak	S	H	
BOMBYCILLIDAE				
Bombycilla cedrorum	Cedar Waxwing	W	C	P

PARULADAE				
Dendroica coronata	Yellow-rumped Warbler	W	H	P
Vermivora celata	Orange-crowned Warbler	S	C	P
Geothlypis trichas	Common Yellowthroat	R	C	P
EMBERIZIDAE				
Zonotrichia leucophrys	White-crowned Sparrow	W	H	P
Melospiza melodia	Song Sparrow	R	C	P
FRINGILLIDAE				
Carpodacus mexicanus	House Finch	R	H	P
Carduelis psaltria	Lesser Goldfinch	R	H	P
PASSERIDAE				
Passer domesticus	House Sparrow	R		P

* The sedentary island race of the Allen's Hummingbird has invaded the southern California mainland from the Channel Islands and has established a resident breeding population on the UCLA campus.

Observations were made on 9/31/95, 11/5/95, 12/20/95, 12/30/95, and 1/26/96 by Travis Longcore, on 2/28/96 by Josh Burnam and Travis Longcore, and on 3/6/96 by Josh Burnam, Travis Longcore, and Catherine Rich. Observations made 3/10/96 by Josh Burnam. Subsequent observations 1997–2002 by Catherine Rich and Travis Longcore.

Herpetofauna

Herpetofauna play a variety of roles in an ecosystem. Amphibian larvae have been shown to be important herbivores and prey in aquatic environments while adults may serve as terrestrial or aquatic predators and prey (Blaustein *et al*. 1994). Reptilian species too serve as comsumers and the consumed. Smaller herpetofauna, lizards and frogs consume arthropods and play a role in keeping these populations in check. Larger organisms, such as snakes, feed on birds, mammals, and other reptiles and amphibians (De Lisle et al. 1987). Some, such as *Crotalus viridis helleri*, may even be top trophic predators. At the site, representative species fed on a variety of organisms including mice, voles, rabbits, ground-nesting birds, and arthropod invertebrates (De Lisle et al. 1987).

Review of current literature reveals that amphibian and reptile populations are increasingly being considered as bioassays: measuring standards for the effects of human activity (Blaustein *et al*. 1994, Case and Bolger 1991). Publications on the extinctions and disappearances of amphibians worldwide have begun speculation on global ramifications (Barinaga 1990, Blaustein and Wake 1990, Phillips 1990). On a local scale, amphibian requirements and dependence on multiple habitat-types within a given ecosystem contribute to its ability as an assay of ecosystem decline and habitat degradation (De Lisle et al. 1987). Reptile species fluctuations are also being observed for unifying patterns; reptile distribution and persistence have been used as measures for the influence of introduced species (Case and Bolger 1991).

Historically, human manipulation has shaped both the borders and species diversity of the site. Reconstruction of the area's original diversity along with its current extant species will not only provide insight into the local human impact, but will also provide a guide for possible restoration. This study utilizes field observations coupled with literature research to assemble listings of species currently habituating the site as well as those that were historically present.

History

The site and the West Terrace are unique in that most of the reptiles on the campus prior to its construction were found there. Boyle king snake and the gopher snake were known to frequent other portions of the campus as well. The most abundant reptiles were the snakes which included:

Bascanion flagellum, red racer;
Crotalus lucifer,[1] Pacific rattlesnake;
Diaophis punctatus amabilis,[2] western ring-necked snake;
L*ampropeltis boylii*,[3] Boyle king snake;
Lampropeltis pyrrhomelaena, coral king snake;
Pituophis melanoleucus catenifer,[4] western gopher snake;
Tantilla eiseni, California black-headed snake; and
Thamnophis sirtalis parietalis,[5] Pacific garter snake (Vogel 1968).

Lizards were also numerous on the site and West Terrace and included *Cnemidophorus stejnegeri*[6] (Stejneger whiptailed lizard, scarce), *Gerrhonotus multicarinatus scincicauda*[7] (alligator lizard, prominant along Stone Canyon Creek), *Sceloporus oxidentalis biseriatus*[8] (fence

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[1] *Crotalus lucifer*, the Pacific rattlesnake, does not appear in an text. The most likely species is *Crotalus viridis helleri*, the southern Pacific rattlesnake. Two other possibilities that are listed as appearing in Los Angeles County are *Crotalus ruber* and *Crotalus mitchelli pyrrhus*. However, the ranges of both these species is more south east and neither are recorded as present in the Santa Monica Mountains (Behler 1979, De Lisle et al. 1987).

[2] *Diadophis punctatus amablis*, the Pacific Ring-necked Snake, has a given range of the San Francisco Bay area of Northern California. It was most likely mistaken for *Diadophis punctatus modestus*, the San Bernardino subspecies, whose range extends north-south from Los Angeles County to San Diego County and east to the San Bernardino Mountains (Behler 1979).

[3] *Lampropeltis boylii* did not appear in any text, while *Lampropeltis pyromelana*, the Coral King Snake, is not an inhabitant of Los Angeles County; its range extends from Arizona to Mexico (Behler 1979). The two likely candidates are *Lampropeltis getulus californiae*, the California king snake, and *Lampropeltis zonata* of either the *parvirubra* (San Bernardino) or *pulchra* (San Diego Mountain) subspecies (De Lisle et al. 1987; Mattoni, n.d.).

[4] *Pituophis melanoleucus cantenifer* is the pacific subspecies of the gopher snake. Its range is from southern Oregon to Santa Barbara County (Behler 1979). It was probably mistaken for the *P. m. annectens*, San Diego gopher snake, the subspecies which ranges from coastal southern California to Baja (Behler 1979). This subspecies is also found in the Santa Monica Mountain range of Los Angeles county (De Lisle et al. 1987; Mattoni, n.d.).

[5] *Thamnophis sirtalis parietalis*, the common garter snake, ranges from Canada to the Great Plains (Behler 1979). The likely subspecies is *Thamnophis sirtalis infernalis*, the California red-sided Garter Snake, which ranges the coast of California, from Humboldt to San Diego counties (Behler 1979). It is also listed as a species resident of Los Angeles county. However no sighting of the subspecies has occurred in the Santa Monica Mountains since 1967 and the population there is considered extinct (De Lisle et al. 1987).

[6] *Cnemidophorus stejnegeri*, the Stejnegeri whiptailed lizard, did not appear in any text. The only whiptailed lizard listed as being present in Los Angeles County and the Santa Monica Mountains is the coastal whiptail, *Cnemidophorus tigris multiscutatus* (De Lisle et al. 1987, Mattoni, n.d.).

[7] *Gerrhonotus multicarinatus scincicauda*, the Oregon alligator lizard, has a range that only reaches as far south as northern California (Behler 1979). The resident alligator lizard of the Santa Monica Mountain range and Los Angeles County is the San Diego subspecies, *Elgaria multicarinatus webbi* (formerly *Gerrhonotus multicarinatus webbi*) (De Lisle et al. 1987, Mattoni).

[8] *Sceloporus oxidentalis biseriatus*, the San Joaquin subspecies of fence lizard, appears only in the lower San Joaquin Valley (Behler 1979). The subspecies of fence lizard that inhabits Los Angeles County is *Sceloporus oxidentalis longipes*. Its range includes coastal area from central California to Baja (Behler 1979).

lizard) and *Uta stansburiana* (brown-shouldered or side-blotched lizard). In addition *Phrynosoma blainvilli*[9] (Blainville horned toad) were also present on the site (Vogel 1968).

The only known amphibian present on the West Terrace which contains the site as it is known today was *Batrachoseps attenuatus*, the California slender salamander. Amphibians on campus were extremely limited on campus because of their need for water to breed. However, other amphibians may have been seasonally present in historical streams of the site during the wet season. Amphibians known to occupy Stone Canyon Creek, which may have been found on the site during wet years, include:

Taricha torosa, water-dog salamander or California newt;
Aneides lugubris, arboreal salamander (associated with *Quercus agrifolia*);
Bufo boreas, western toad;
Scaphiopus hammondi, western spadefoot toad;
Hyla regilla, Pacific tree-frog; and
Rana aurora, California red-legged frog (Vogel 1968).

Herpetofaunal Survey

Observational studies concerning the absence or presence of herpetofauna were conducted using walk-throughs of the sites. Three such walk-throughs were conducted during mid-February 1996 at each site. Each walk through lasted about an hour and species were chronicled as either present or absent. Further, trappings conducted by entomologists at the sites resulted in the capture of herpetofauna specimens (see arthropod section of this report for the complete trapping procedures and dates). This information was synthesized with that of the walk-through data to generate the observed-species list (Table 5).

Two important notes concerning listings must be made. First, observations and trappings were limited to those species that are active during the course of this study. Of all the species, only the side-blotched lizard is active year round (De Lisle et al. 1987). A majority of the reptile species were still in hibernation or had just emerged from hibernation at the time the study was conducted; appearance times ranging from late February to April (De Lisle et al. 1987). Emergence is typically followed by a period of sluggishness and inactivity, adding additional limitations on sightings (De Lisle et al. 1987). The addition of expected species to the list was based on information of the relative abundance of the species given in De Lisle et al. (1987).

[9] *Phrynosoma blainvilli* is listed as the Blainville horned toad. The genus *Phrynosoma* belongs to the Iguanid family of lizards. The likely species described is the California subspecies of the coastal horned lizard, *Phrynosoma coronatum frontale* (De Lisle et al. 1987).

Second, the historically-present species list was taken primarily from the findings of a study of the campus done by Vogel (1968). However, cross reference of species names with current literature turned up several discrepancies. Many species listed by Vogel were not found listed in any current literature or guides nor did they turn up on a search of extinct species. Further, some were listed as subspecies whose geographical ranges do not encompass the site area. The following is an explanation of the alterations made to the "historically-present" category constructed during the generation of the list. Decisions were based on existing data on reptile and amphibian ranges taken mainly from Behler (1979), De Lisle et al. (1987), and an unpublished listing of species present in Los Angeles County (Mattoni, n.d.).

Table 6. List of reptile and amphibian species appearing in Los Angeles County (after Mattoni). "X" represents species historically present on the West Terrace (Vogel 1968). "A" represents species historically present on the UCLA campus, but not in the site area (riparian dependent). "E" represent non-observed, but expected species. "O" are species observed in the field. WRSP is Will Rogers State Historical Park (the control site). Expected species for WRSP are confined to the subset of those species designated as historically present at the UCLA site.

Scientific Name	Common Name	Historically Present	WRSP	UCLA
BUFONIDAE				
Bufo boreas halophilus	California toad	A		
HYLIDAE				
Hyla regilla	Pacific tree frog	A		
PELOBATIDAE				
Scaphiopus hammondi	western spadefoot toad	A		
PLETHODONTIDAE				
Batrachoseps attenuatus	California slender salamander	A	O	O
Aneides lugubris	aboreal salamander	A		
RANIDAE				
Rana aurora draytoni	California red-legged frog	A		
SALAMANDRIDAE				
Taricha torosa torosa	California newt	A		
IGUANIDAE				
Phrynosoma coronatum	California horned lizard	X		
Sceloporus occidentalis longipes	western fence lizard	X	E	E
Uta stansburiana elegans	side-blotched lizard	X	O	O
TEIIDAE				
Cnemidophorus tigris multiscutatus	coastal whiptail	X	E	
ANGUIDAE				
Gerrhonotus multicarnatus webbi	San Diego alligator lizard	X	E	E
COLUBRIDAE				
Thamnophis siralis infernalis	California red-sided garter snake	X		
Lampropeltis zonata parvirubra	San Bernardino mountain kingsnake	X	E	
Lampropeltis getulus califouniae	San Diego mountain kingsnake	X	E	E
Diadophis punctatus modestus	San Bernardino ring-necked snake	X	E	
Pituophis melanoleucus annectens	San Diego gopher snake	X	E	E
VIPERIDAE				
Crotalus viridis helleri	southern Pacific rattlesnake	X	E	

The survey conducted during February 1996 confirmed the presence of only two species: *Batrachoseps attenuatus* and *Uta stansburiana*. However, as mentioned earlier, reptilian hibernation may be responsible for the absence of the three other species found in 1968.

Pituophis melanoleucus annectens does not emerge from hibernation until March and does not become active during the day until April (De Lisle et al. 1987). *Lampropeltis* species emerge between February and March and only become active during the day in warmer months (De Lisle et al. 1987). *Gerrhonotus*, too, emerges in February (De Lisle et al. 1987). As for amphibians, Vogel (1968) notes that no species, with the exception of *Batrochoseps attenuatus*, were present on the West Terrace even prior to development. While hibernation may explain the apparent absence of *Gerrhonotus*, *Pituophis,* and *Lampropeltis* from the site, it cannot account for the absence of the remaining eight reptilian species.

Substantial human-created disturbance of the west terrace in the late 1950s and early 1960s may explain this greatly reduced abundance and diversity of the herpetofauna. From 1958–61, all native vegetation was cleared from the West Terrace while 1962–1963 saw the commencement of fire resistant plant tests in the area of the ornamental horticulture land (Vogel 1968). These disturbances saw the abandonment of the area by the herpetofauna. A survey in 1962–1963 found that this introduction of species and the creation of large scale disturbances had simplified the community. Of the original herpetofauna, eight of the reptile species had not returned to the site. Only *Gerrhonotus multicarinatus scincicauda, Uta stansburiana*, *Pituophis melanoleucus annectens*, a species of *Lampropeltis* and the amphibian *Batracloseps attenuatus* had found their way back.

Further, with the growth of the university, the undeveloped land area of the west terrace has been greatly reduced; the site, which currently encompasses roughly four acres, is all that remains. Based on this, it seems unlikely that further recolonization took place following Vogel's survey in 1968. Expansion of the human matrix not only reduces habitable area but also closes off corridors for colonization (Soule et al. 1992). As human simplification continued over time, the chance of colonization inversely decreased. As well, herpetofauna are not exceptional colonizers (Case and Bolger 1991). Research on an analog of habitat-fragment colonization, island colonization, reports reptiles only intermediate in colonization ability and amphibians as poor (Case and Bolger 1991).

Edge effects also probably contributed to lowering species diversity. Concurrent with a decrease in fragment size is an increase in edge effects. These effects are amplified when coupled with the introduction of non-native predatory species. Increased edge allows for further penetration of predators leading to increased predation. Non-evolutionary association with these foreign invaders leave native herpetofauna exceptionally vulnerable (Case and Bolger 1991). The devastating effects of these human-associated species, especially the house cat (*Felis domesticus*) and rats (*Rattus rattus* and *Rattus norvegicus*), on native herpetofauna has been well documented (Case and Bolger 1991). Further, invasion by competitive species of plants may also have had a detrimental effect on the fauna. Coverage by invasive foreign species

may in fact further fragment the site into isolated patches of native flora. This would in turn decrease herpetofauna diversity; native species may not use non-native coverage for breeding, shelter, or foraging (Soule *et al*. 1992).

In conclusion, the review of the literature combined with direct observations predicts that the extant herpetofauna of the site is consistent with that of Vogel's survey of the West Terrace in 1968. The presence of both *Batrachoseps attenuatus* and *Uta stansburiana* were visibly established in the field. While not directly observed, the life history characteristics (particularly local abundance and food requirements) of the other three species define them as likely and well adapted for the current conditions. The alligator lizard, *Gerrhonotus multicarinatus scincicauda,* is exceptionally common and has been found within the urban matrix, thriving in areas where human activities have increased shelter, moisture and invertebrate prey (De Lisle et al. 1987). Human determined fire suppression of the site has increased the range of acceptable habitat, allowing the site to meet these criteria. Of the species of *Lampropeltis*, *Lampropeltis getulus californiae* is a likely resident of the site. Surveys conducted during this study revealed an abundance of its favored prey species (mice and lizards). Its prevalence in the surrounding mountains suggests that it is also present on the site. T he presence of *Pituophis melanoleucus annectens* is expected as well. Like *Lampropeltis*, *Pituophis* feeds on a variety of the mammals found (mice, rats, rabbits) (De Lisle et al. 1987). Further it is the most common snake in the surrounding mountain areas (De Lisle et al. 1987).

The only addition to Vogel's list is the western fence lizard *Sceloporus occidentalis longipes*. It is common throughout all major habitat types in the Santa Monica Mountains (De Lisle et al. 1987). Insect prey is abundant at the site. It is likely that this organism's versatility and generalist nature allowed it to recolonize. Its hibernation into March would explain its absence from the field.

Realistically, the restoration of native herpetofauna may run into both political and social barriers. Vogel's assessment of amphibian historical non-abundance is not entirely true. Dry Canyon, running the length of Veteran Avenue, historically provided riparian habitat along the West Terrace. Clearly, the reestablishment of this water way is infeasible. The expense of such a project coupled with predictably low political support makes it a ridiculous proposition. However, without appropriate habitat, amphibian populations cannot be re-established and diversity will remain restricted to *Batracloseps attenuatus*. As well, herpetofauna do not have the popular support of other groups such as mammals or birds. It is likely that grant proposals requesting funds for snake and lizard repopulation would not be met with much enthusiasm. Further, the dangerous nature of some species, such as *Crotalus viridis helleri* serves to exclude it from consideration entirely. Ultimately, limited public knowledge of the importance of herpetofauna in ecosystem function can only hinder restoration efforts.

Arthropods And Other Terrestrial Invertebrates

Invertebrates provide over 97% of animal biomass and 99.5% of animal species in most terrestrial ecosytems. Among invertebrates the phylum Arthropoda is the most species-rich group. Arthropods are defined by external skeletons and jointed appendages. Three major arthropod classes contain the majority of species: Arachnida (spiders and mites), Crustacea (crabs, pillbugs and relatives), and Insecta. Several small classes include centipedes and millipedes. Other classes that were formerly abundant are now extinct. Our invertebrate survey includes molluscs, but only three species are found on the site, two are serious exotic pests, in addition to two species which now appear extinct. Nematodes (roundworms) constitute a large phylum that are important herbivores, have varied roles in food webs, and represent a large proportion of animal biomass in some ecosystems. These mostly microscopic animals were not surveyed because of technical difficulties in collection, preparation, and identification.

Despite the vast numbers of insect species and individuals, their high biomass in proportion to other animals, and their enormous variety of ecological functions, little work has been done to inventory and monitor them. Butterflies are the best known insects, if not the best known animal group. Virtually all species, about 15,000, have been described, including most of their distributions, and many life histories. Information on other higher taxa, including many whole orders, are variously less developed. Among the better known groups are some beetle families (scarabs, cerambycids, cicindellids, and coccinellids have newsletters devoted to them), bombycoid moths, Odonata (dragon- and damselflies), and ants.

With increasing concern in conservation biology, including its explicit goal to establish networks of reserves that maximize protection of biotic diversity, it is logical to utilize the most diverse biotic elements as indicators for the assessment of land areas for conservation values. In addition to their value of expressing diversity by indices of diversity from quantitative sampling, the use of arthropods as indicators of long-term change by regular monitoring provides abundant data for representatives of a broad spectrum of ecological function (Kremen *et al*. 1993).

Due to human encroachment on insect habitat, many species have been extirpated throughout the Los Angeles basin. Some species endemic to Los Angeles have become extinct. However, a natural habitat home to many plants and animals still remains on the the UCLA campus site. Because of the short duration available for this study and its timing during the winter months, it was possible to determine only a few of the species that visit or inhabit the site. Unfortunately, no data could be found concerning species that were historically present, although some entomological work was done by Professor John Belkin during the 1950-1980 period.

Despite these limitations, it is possible to determine species that are probably present or were historically present at the site. Thus, many species of insects are known to inhabit nearby similar habitats of coastal sage scrub and chaparral. Species including those found at Will Rogers State Park are likely inhabitants of the site. Many other records are available in the natural history museum and in local collections from material taken nearby in the Santa Monica Mountains. These probably historically inhabited the site and may still occasionally visit.

This is not to imply that these are the only species present at the site. The goal of this report is to identify which species of arthropods are probably present and those that probably occurred historically. Some groups have been included for which no direct evidence exists.

Three separate approaches of the arthropod survey were undertaken, each with a different objective. The first is a general listing of all species of arthropods that potentially occurred on the site historically. The list was constructed from several sources. The basic list was derived from Hogue (1993), noting all species that occur in either coastal sage scrub, chaparral, or oak woodland. Other group lists were suggested by local experts on the basis of their experience. These include: Odonata by Rosser Garrison, Scarabid beetles by Arthur Evans, Diptera (Bombyliidae, Asilidae, Syrphidae, Therevidae, Tabanidae, Acroceridae, Startiomyidae, Rhagionidae, Conopidae) by Rick Rogers, and Lepidoptera (butterflies) by Rudi Mattoni. Moth species in the superfamilies Noctuoidea, Bombycoidea, and Geometroidea are taken from an intensive 10-year inventory (1948–1957) made by Noel McFarland (1965) from upper Benedict Canyon, a locality only three miles distant from UCLA. The McFarland list was added using results of continuing collecting since 1988 by Paul and Sandy Russell at Encinal Canyon, Malibu. The latter are the only two systematic inventories of moths conducted across any of southern California. Comparison of number of moths listed by Hogue with the McFarland list, and species suggested by experts for a few other insect groups, indicates how incomplete the overall list given herein is. Overall, there were three to four times the species richness implied by our list.

The incomplete historic listings are valuable for emphasizing the substantial biodiversity potential on even this small, now isolated, fragment. T his part of the list probably substantially underestimates richness of these groups, particularly within the larger orders. The list presented herein is the only comprehensive inventory available for the region. As the listing is made more accurate by continuing sampling of both the site and throughout similar communities in the Santa Monica Mountains, the list will provide a relevant database for later monitoring of changes and responses of the most significant group of organisms to changing conditions of the site. The list compiled to date is given as Appendix E.

Two quantitatively determined arthropod surveys

To survey arthropods a series of pan traps and pitfalls were set in areas covering similar vegetation types with identical traps on both. Pitfall traps were used to trap ground-dwelling arthropods. They consist of two plastic food containers: the first a one-quart, the other a two-quart container. The smaller container is nested in the larger, then a hole is dug in the desired area. The complete trap is set in the hole, leaving the rim of such flush to the ground, and back filling it. Once set, the interior of the one quart container is filled with approximately a half inch of ethylene glycol (commercial antifreeze) to preserve specimens that fall into the traps. A roof of stilted wood was then placed over the trap to avoid contamination and desiccation of the medium.

Pan traps were used to collect flying arthropods. They were simply a one quart food container spray painted bright yellow. The pan was filled with approximately a half inch of ethylene glycol, placed close to the pitfall traps. The traps were secured by external stakes to keep them in place.

The traps were monitored regularly and collected bi-weekly. The contents of the traps were transferred to 100 ml collection jars and then taken for classification and archiving. Although these methods of trappings have an inherent error in randomness of species and correlation to species density, these methods have proved to be successful in prior applications (Southwood 1978). It is believed for this study these trapping methods will provide a complete inventory of the arthropod assemblage.

A total of six pan traps and six pitfall traps were set at the UCLA site. A pan and pitfall were placed next to each other at six locations on the site numbered 1–6. Three traps were placed in areas with native California sage flora. The other three were placed in areas that were influenced by invasive/non-native plant species. Following are brief descriptions of the locations:

TRAP #1: Laurel smac, giant rye grass, European bunch grass

TRAP #2: Tobacco trees, European bunch grass, Victoria's box tree, various weeds

TRAP #3: *Stipa*, California sagebrush, beavertail cactus

TRAP #4: Small live oak tree, fan palm, sumac tree, European bunch grass

TRAP #5: Oak grove

TRAP #6: *Stipa*, California sagebrush, rosemary

Four sets of traps were used at WRSP in areas similar to the UCLA site. A brief listing of the locations is as follows:

TRAP #1: Laurel sumac, California sage, black sage

TRAP #2: *Stipa*, California sage, sumac trees

TRAP #3: Treed area

TRAP #4: Monkeyflower, black sage, laurel sumac

Difficulty arose in the classification of many smaller specimens collected due to the lack of information and research on arthropods.

Table 7. Arthropods from pitfalls at UCLA and WRSP. Known introduced species marked with **X**.

	UCLA-1	UCLA-2	UCLA-3	UCLA-4	UCLA-5	UCLA-6	WRSP-1	WRSP-2	WRSP-3	WRSP-4
CLASS INSECTA										
Primitive Wingless Insects										
ORDER COLLEMBOLA										
Family Entomobridae										
Entomobrid 1	4	16	1		5	40	4	13	7	28
Family Sminthuridae										
Sminthurid 1	1	1	1			1	23	3	10	2
Primitive Winged Insects										
Orthopteroids										
ORDER ORTHOPTERA										
Family Stenopalmatidae										
Stenopelmatus spp.	2	5	1	3	3	6		2		1
Family Rhaphidophoridae										
Ceuthophilus californicus	1	2	7	7		5	2	2	2	5
ORDER DERMAPTERA										
Forficula spp. **X**		2								
Euborellia annulipes	2	2	2	1		1	139	217	310	418
ORDER BLATTODEA										
Parcoblata spp.	16	11	4	8	1	2	9	3		
Blatta orientalis **X**	94	9	129	172	10	56	133	73	89	71
True Bugs and Homoptera										
ORDER HETEROPTERA										
Family Lygaeidae										
Lygaeid 1 (lg. forelegs)	3	1				1	1		1	
Family Rhopalidae										
Rhopalid 1 (hairy)						1				
ORDER HOMOPTERA										
Family Cicadellidae										
Cicadellid 1 (sm slender drk)		2		1		2	1		2	1
Cicadellid 2 (fat drk)	2	7	3			1				
Family Cixiidae										
Cixiid 1										1
Holometabola										
ORDER COLEOPTERA										
Family Cantheridae										
Cantharis spp.		1			1					
Cantherid 1 (drk. sm.)							1			
Family Carabidae										
Amara sp.		2					1	9		
Calantus ruficollis	2	12					6	1	1	
Pterostichus sp. 1		11		3	6	1	12	4	10	2
Family Cerembicidae										
Ipochus faciatus									1	
Family Coccinellidae										
Coccinellid 1 (spp.?)				1					121	
Family Elateridae										
Elaterid 1 (lg. blk.)	1									
Family Mordellidae										
Mordellid 1 (drk. brwn.)		1	2			1	1			1
Family Ptinidae										
Ptinus fur							1			
Ptinid 1							1			
Family Scarabidae										
Melolonthinae *Serica* spp.							1	1		
Family Silphidae										
Necrophilus sp.							1			
Family Staphylinidae										
Sepedophilus sp.							1			
Family Tenebrionidae										
Coniontus sp.	1					1				
Cratidus sp.									2	3
Eleodes laticollis							3	4	13	5
Teneb. 1 (sm. slender)		1								2
Tenebriad *Nyctoporis*			1	1			1		13	
Family Zopheridae										
Phloeodes spp.		1							2	

ORDER DIPTERA										
Family Anthomyiidae										
Anthomyiid 1 (sm. dk.)						1				
Anthomyiid 2 (lg.)		1	1	3		2	1	2	1	
Anthomyiid 3 (spttd wings)			1					1	3	1
Family Calliphoridae										
Pollenia rudis									2	
Calliphorid 1 (sm. or med.)							3		7	
Calliphorid 2 (greenbottle)							1		5	
Family Drosophilidae										
Drosophilid 1 (spp.?)							2		3	
Family Heleomyzidae										
Sullia spp.									6	
Family Muscidae										
Fannia canicularis						1				
Family Mycetophilidae										
Mycetophilid 1 (striped abd.)				1						
Mycetophilid 3 (sm.)			1		1		1			
Mycetophilid 4 (lrg.)					9		2			1
Family Phoridae										
Phorid 1 (lg.)							1	5		
Phorid 2 (sm.)				6	2	1	1			5
Family Sarcophagidae										
Sarcophagid 1 (med.)				1	2		4			1
Sarcophagid 2 (sm.)							1			
Family Tachinidae										
Peleteria spp.								1		2
Ptillodexia californica								1	1	
Family Tipulidae										
Tipulid 1 (lg.)									3	
Tipulid 2 (sm.)										1
ORDER HYMENOPTERA										
Family Andrenidae										
Perdita sp.				1						
Family Apidae										
Bombus vosnosenskii							1		6	
Apid 1 (blk. bee)									2	
Apis mellifera	1									
Family Cecidomijiidae										
Cecidomijiid 1 (gull knat)									1	
Family Dryinidae										
Drynind 1 (red. fem.)					1		39	12	13	31
Family Formicidae										
Camponotus sp.								2	1	
Formica spp.							1	3	2	4
Iridomyrmex humilis	132	176	120	97	63	83	134	46	1	48
Iridomyrmex humilis (winged)		1			1	2	1	2		
Family Ichneumonidae										
Ophion sp.				1						
Family Pompilidae										
Pompilid 1 (dk. blk., drk. wing)								5		1
Pompilid 2 (sm. blk., red abd.)								1		
Pompilid 3 (drk. blue)						1				1
Family Vespidae										
Vespula spp.	1			2						
ORDER LEPIDOPTERA										
Microlepidoptera 1 (Micromoth, feathered tip)	3		2	1	1	1			1	
Family Hesperidae										
skipper moth							1		1	
ORDER NEUROPTERA										
Family Hemerobiidae										
Hemerobiid 1			1							
ARACHNIDS										
ORDER ACARI										
Family Trombididae										
Trombidid 1 (red mite)							1	3	3	
ORDER ARANEAE										
Family Ctenizidae										
Ctenizid 1									1	
Family Dysderidae										
Dysdera crocata	5	5	1		2			1	1	
Family Gnaphosidae										
Poecilochroa sp.	1						1			
Gnaphosid 2 (drk.)	5	5	2	2		6		5		
Family Lycosidae										
Lycosid 1 (lg.)		1	1	2			2	4	4	4
Lycosid 2 (sm. juv.)	7	11	5	11	4	6	12	17	8	12
Lycosid 3 (lg. pale)							1	3	1	

Lycoisd 4 (med. dk.)	3	7	6	6	5	5	7	11	13	14
Lycosid 5 (banded lgs.)			2		3	2		6	7	4
Family Phalangiidae										
Phalangiid 1							1			
Family Pholcidae										
Pholcid 1		1				2		1	1	2
Family Salticidae										
Salticid 1								1		
Family Talmicidae										
Talmicid 1 (crab spider)								1		
CRUSTACEA										
ORDER ISOPODA										
Armadilidium spp.	467	289	22	25	418	10	162	23	15	8
Porcellio laevis	2	2		2	15	1	18	3	16	3
ORDER AMPHIPODA										
Talitroides sylvaticus							2	1		
OTHER ARTHTROPODS										
CLASS DIPLOPODA										
Millipede lg.			1			1				
Millipede sm. slender	2	13		2	8	3	2			2
CLASS CHILOPODA										
Scolopendra centipede juv.	1			2			3	2	1	1
Lithobius spp. centipede		1				1				
ORDER THYSANURA										
Lepismatidae	2		11	1	1	4	9	24	9	39

Table 8. Arthropods from yellow pan traps at UCLA and WRSP. Known exotic species are marked with **X**.

	UCLA-1	UCLA-2	UCLA-3	UCLA-4	UCLA-5	UCLA-6	WRSP-1	WRSP-2	WRSP-3	WRSP-4
Class Insecta										
Primitive Wingless Insects										
ORDER COLLEMBOLA										
Family Entomobridae										
Entomobrid 1		11	1				1	1	4	
Family Sminthuridae										
Sminthurid 1				2					1	
Orthopteroids										
ORDER ORTHOPTERA										
Family Rhaphidophoridae										
Ceuthophilus californicus							1	1		
ORDER DERPAPTERA										
Euborellia annulipes						1	2	1		1
ORDER BLATTODEA										
Parcoblata spp. roach								3		
Blatta orientalis **X**	12	20	22	47	8	120	55	47	27	41
True Bugs and Homoptera										
ORDER HETEROPTERA										
Family Lygaeidae										
Geocoris spp.		1								
Lygaeid 1 (lg forelegs)				1		1				
Lygaeid 2 (med yellow)			1							
Family Reduviidae										
Reduviid 1 (vry. slender)						1				
ORDER HOMOPTERA										
Family Aphidae										
Aphid 1 (winged)							2			1
Family Cicadellidae										
Cicadellid 1 (sm. slender drk)		2	19	1		33	1	3		4
Cicadellid 2 (fat drk)		3	9	3		4	2	2	1	1
Cicadellid 3 (lrg. orange)		1	3				1	3		1
Holometabola										
ORDER COLEOPTERA										
Family Anthicidae										
Anthicid 1				1						
Family Cantheridae										
Cantharis spp.					2					
Cantherid 2 (drk.sm.)							1			
Family Carabidae										
Amara sp.		5	1			2	1	6		
Calantus ruficollis		40		3	1					
Pterostichus sp.		2			6		2		1	
Family Cerembicidae										
Ipochus faciatus				1						
Family Chrysomelidae										

Subfamily Alticinae 1		1					1			
Family Elateridae										
Elaterid 2 (vry.sm.)		1								
Family Melynidae										
Nr. collops					1					
Family Mordellidae										
Mordellid 1 (drk. brwn.)		1					1			1
Family Ptinidae										
Ptinid 1							1			
Family Phengodidae										
Phengodid 1		1								
Family Scarabidae										
Subfamily Melolonthinae					1					
Serica spp.										
Family Staphylinidae										
Staphylinid 1 (vry. sm.)		1								
Family Tenebrionidae										
Cratidus sp.		1								
Tenebrionid 1 (sm. slender)		14	1							2
ORDER DIPTERA										
Family Anthomyiidae										
Anthomyiid 1 (sm.dk.)						2				
Anthomyiid 2 (lg.)	2	2	2	2		6	9	11	1	12
Anthomyiid 3 (sptd wings)				2	1			1	3	9
Anthomyiid 4 (yllw abd.)						1				
Family Bibionidae										
Bibionid 1		2								
Family Bombyliidae										
Paravilla spp.		1								
Family Calliphoridae										
Pollenia rudis		1				1				
Calliphorid 1 (sm. or med.)		2	1	2						
Calliphorid 2 (greenbottle)	1		1	1	1	2			1	
Family Drosophilidae										
Drosophilid 1 (spp.?)			1							
Family Empidae										
Empid 1					1				2	1
Family Heleomyzidae										
Sullia spp.					6		3			
Family Mycetophilidae										
Mycetophilid 1 (striped abd.)	1	1	1	3	20		5		2	1
Mycetophilid 2 (banded wings)		3	6	1	1		1		5	
Mycetophilid 3 (sm).		2		1		1	12		1	
Mycetophilid 4 (lrg.)				1	1			2	16	
Family Phoridae										
Phorid 1 (lg.)		2		1	2			3		1
Phorid 2 (sm.)		1						2		
Family Pscocidae										
Pscocid 1									1	
Family Sarcophagidae										
Sarcophagid 1 (med.)	1	1	1			1	1	2		1
Sarcophagid 2 (sm.)		1								
Family Syrphidae										
Copestylum marginatum										1
Family Tachinidae										
Peleteria spp.				1				1		6
Family Tipulidae										
Tipulid 2 (sm.)		1								
ORDER HYMENOPTERA										
Family Andrenidae										
Perdita							1	1		
Family Anthophoridae										
Melessodes spp.							1	1		
Family Apidae										
Bombus vosnosenskii						1	2	1		
Apid 1 (blk. bee)									1	
Family Braconidae										
Braconid 1		1								
Family Cecidomijiidae										
gull gnat		1								
Family Chalcidae										
Chalcid 1 (bnded wing)				1					1	
Family Chrysididae										
Chrysidid 1								1		
Family Colletidae										
Hylaeus spp. (yllw face)		2				1				
Colletid 1 (sm.)		1					1			
Family Culicidae										
Culicid 1 (mosquito)			1							
Family Gasteruptidae										
Gasteruptid 1			1							

Family Helictidae										
Agaposcemon texana							3	2		
Helictus spp. ????a=e		1					2	1		
Family Ichneumonidae										
Ichneumonid 1 (vry.sm.)	4	1	1	3			3			
Ichneumonid 3 (orange, blk. head)					1					
Ophion spp.							1			
Family Formicidae										
Formica spp.				1			1	1	1	
Iridomyrmex humilis **X**	6	23	111	31	17	24	32	26	7	7
Iridomyrmex humilis (winged)		2			2			4		
Family Pompilidae										
Pompilid 1 (dk. blk., drk. wing)							26	20	3	3
Pompilid 2 (sm.blk. red abd.)							3			2
Pompilid 3 (drk.blue)							7			
Pompilid 4 (sm. blk., red legs)								1		
Pompilid 5 (sm. blk.)		1								
Family Pteromalidae										
Pteromalid 1								1		
Family Sphecidae										
Subfamily Philanthinae 1		7		1		4	12	11	6	11
Subfamily Trypoxyloninae 1							4			
Subfamily Pemphredoninae										2
Family Vespidae										
Vespula spp.		1	1		1	3	28	2	26	27
ORDER LEPIDOPTERA										
Micromoth 1 feathered tip	1	1	2		3	1	2	1	1	2
Family Hesperidae										
skipper moth			1							
ORDER NEUROPTERA										
Family Chrysophidae										
Chrysophid 1		2								
Family Hemerobiidae										
Hemerobiid 1		1								
Family Myrmeleontidae										
Myrmeleontid 1								1		
ARACHNIDS										
ORDRE ACARI										
Family Trombididae										
Trombidid 1 (red mite)		1	1			1				
ORDER ARANAE										
Family Ctenizidae										
Ctenizidae 1						2				
Aposticus spp.			1			1				
Family Dysderidae										
Dysdera crocata			1		1		1		1	
Family Gnaphosidae										
Gnaphosid 2 (drk.)				1	1	1		3		
Family Lycosidae										
Lycosidae 1 (lg.)				2				1	1	1
Lycosidae 2 (sm. juv.)		6	7	10	1	1	7	6	4	3
Lycosidae 3 (lg. pale)				3		1		1		
Lycoisdae 4 (med.dk.)		8	3	2		1	7	2	5	2
Lycosidae 5 (banded legs)			1					1	3	1
Family Pholcidae										
Pholcidae 1						1				
Family Salticidae										
Salticid 1								3		
Family Talmicidae										
Talmicid 1 (crab spider)								1		
Family Xysticus										
Tibellus spp. crab spider			1							
ORDER OPILIONES										
daddy long legs								1		
CRUSTACEA										
ORDER ISOPODA										
Armadilidium spp.	4	5		15	3		47	14	11	7
Porcellio laevis								2	2	
ORDER AMPHIPODA										
Talitroides sylvaticus		1	1							
OTHER ARTHROPODS										
CLASS DIPLOPODA										
Millipede (sm. slender)						1				
CLASS CHILOPODA										
Lithobius spp.							1			
Family Geophilomorphidae										
Geophilomorphid 1 (long cent.)								1		

ORDER THYSANURA								
Lepismatidae	1	3		5	3	12	3	7
Lasioglossum spp.				10		1		4

Some noticeable patterns observed include a large alpha diversity between trap settings. Alpha diversity refers to the number of species that can be found in a small homogeneous area (Meffe 1994). For instance, trap #2 at the UCLA site, which is the most invaded site, had the largest and most diverse number of arthropods of all the sites. Adjacent traps, such as UCLA #3, which was approximately 30 meters away from #2 had only half the numbers found at #2. The oak grove at UCLA trap #5 proved to have a very low alpha diversity. Only 17 different arthropods were found when oak groves normally sustain a much higher arthropod diversity. This is due to the microclimate and undershrub associated normally with oak groves which was lacking at the UCLA site.

Butterflies

Butterflies are among the best understood group of animals on earth and serve as key indicators of environmental quality as expressed by biodiversity (Mattoni 1990). Butterflies may be used to assess the conservation status of local habitats. Because butterflies are well known across the Los Angeles basin, any changes observed in their patterns of distribution and abundance over time may be good indicators of disturbance and fragmentation over the geographical scale of investigation. Baseline data on butterfly communities therefore has value in documenting environmental changes.

Butterfly species have evolved and become adapted to a wide variety of environmental conditions. They presently can be found across all terrestrial biomes except extreme arctic and high altitude areas. Each species has characteristics which are expressed by habitat preferences as plant community structure, movement and migration patterns, foodplant use by larvae, and water and nectar sources, among others. Butterflies are completely dependent on plants as adults and larvae. Foodplant of a butterfly refers to the larva (caterpillar nutrition resource. Larval feeding is limited by plant chemistry and specific plant parts and condition (flowers, leaves, seeds, etc.) (Scoble 1995). Detailed foodplant information, available for most species, provides for their classification as monophagous (feeding only on a single species of plant), oligophagous (feeding on plants of one genus or few related genera of plants), or polyphagous (feeding on many plants of two or more families).

Each vegetated terrestrial biome can support a characteristic complement of butterfly taxa (New 1991). The butterfly species observed or detected in the grassland and disturbed coastal sage scrub at the site include the Gulf fritillary (*Agraulis vanillae incarnata*), West coast lady

(*Vanessa carye anabella*), Monarch (*Danaus plexippus*), Cabbage butterfly (*Pieris rapae*), Common white (*Pieris protodice*), Buckeye (*Precis coenia*), Marine blue (*Leptotes marina*). Expected species would include at least fifty butterflies listed on the systematic treatment list (Table 7).

These butterflies represent what would normally be found in adjacent habitats and surrounding ecological communities. Not all butterfly species have been identified, as undisturbed coastal sage scrub provide suitable habitat for many migratory species.

Habitats where butterfly species live are quite dynamic, and at times have varying carrying capacities. Habitats change and so do butterfly species which must adapt to the foodplant available. Butterfly dispersal rates (migration) is commonly associated with changing habitats. Capability for adaption is sometimes limited as evidenced by the extinction of Wright's leanira checkerspot (*Melitaea leanira wrightii*), a species once common in the Santa Monica Mountains.

As natural habitats are degraded and fragmented and the spreading of exotic invasive foodplants continues, the densities of native butterflies will continue declining to a point where genetic, environmental and demographic stochasticities will lead to extirpations (Mattoni 1990).

Habitat preservation is a vital component to protecting butterflies from extirpations and should be the first step to any conservation plan if butterflies are to remain extant. As noted earlier, butterfly diversity is important indicators on the health of the biotic community. Far more is known about the host plant relationships of butterflies than about the diets of any comparable group of herbivores.

Table 8. Butterfly species found on the site. Column 1, Scientific name; 2, Probable historic occurrance; 3, Probable present occurrence or potentially reintroduceable; 4, Observed during study. Status: RN, resident using native foodplant; RX, resident using non-native foodplant; RNX resident using both native and non-native foodplants; MR, regular migrant; MO, sporadic migrant; XX, non-native species using native foodplant; XN, non-native species using non-native foodplant; EX, extirpated, native foodplant probably not present; I, restorable if foodplant reintroduced or increased.

TAXON		Historic	Present	Observed
Family Papilionidae				
Papilio zelicaon		RX	RX	X
Papilio rutulus rutulus		RN	RN	X
Papilio eurymedon		RN	RNI	
Family Pieridae				
Pieris rapae			XN	X
Pieris protodice		RN	RNX	
Anthocharis sara sara		RN		
Colias eurytheme		RN	RNX	
Colias alexandra hardfordi		RN	I	
Zerene eurydice		RN	EX	
Phoebis sennae marcellina			XN	
Eurema nicippe			XN	
Family Nymphalidae				
Danaus gilippus strigosus		MR	MR	X
Danaus plexippus		RN	RN	X
Coenonympha tullia california		RN	RNI	
Cercyonis sthenele silvestris		RN	RNI	

Agraulis vanillae incarnata			XN	X
Euphydryas chalcedona chalcedona		RN	RNI	
Chlosyne gabbii gabbii		RN		
Chlosyne leanira wrightii		RN		
Vanessa atalanta rubria		RN	RN	X
Vanessa cardui		RN	RN	X
Vanessa carye anabella		RN	RN	X
Vanessa virginiensis		RN	RN	
Nymphalis antiopa		RN	RN	
Precis coenia		RN	RN	X
Liminitis lorquini lorquini		RN		
Adelpha bredowii californica		RN	RN	
Family Lycaenidae				
Apodemia mormo virgulti		RN	RNI	
Calephelis nemesis		RN	RN	
Atlides halesus corcorani		RN	RN	
Strymon melinus pudica		RN	RN	X
Satyrium tetra		RN	RNI	
Satyrium saepium saepium		RN	RNI	
Callophrys augustus iroides		RN	RNI	
Callophrys affinis perplexa		RN	RNI	
Brephidium exilis		RN	RN	X
Leptotes marina		RN	RN	X
Everes amyntula		RN	RNI	
Plebejus acmon acmon		RN	RN	
Glaucopsyche lygdamus australis		RN	RNI	
Euphilotes bernardino bernardino		RN	RNI	
Celastrina argiolus echo		RN	RNI	
Family Hesperidae				
Ochlodes agricola agricola		RN	RN	
Ochlodes sylvestris		RN	RN	
Paratrytone melane		RN?	RN	X
Hylephila phyleus		RN	RN	X
Atalopetes campestris		RN?	RN	
Ochlodes sylvanoides sylvanoides		RN	RN	
Erynnis tristis tristis		RN	RN	
Erynnis zarucco funeralis		RN	RN	X
Pyrgus communis albescens		RN	RN	X
Heliopetes ericetorum		RN	RNI	

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APPENDIX A: PLANT TRANSECT DATA

UCLA-1
0.5-*Cistus villosus*
1.0-*C. villosus*
1.5-*C. villosus*, *Ceanothus sp.*
2.0-*C. villosus*
2.5-*C. villosus*, *Ceanothus sp.*
3.0-*A. californica*
3.5-*Ceanothus sp.*
4.0-*Calystegia macrostegia* , *Hedera canariensis*
4.5-*Poacea*, *H. canariensis*, *Ceanothus sp.*
5.0-*Poacea* spp, *H. canariensis*, *Ceanothus sp.*
5.5-*Malosma laurina*
6.0-*M. laurina, Poacea spp, H. canariensis*
6.5-*M. laurina, Poacea spp*, *H. canariensis*
7.0-*M. laurina, Poacea spp*, *H. canariensis*
7.5-*M. laurina, Poacea spp*, *H. canariensis*
8.0-*Soalnum xantii*
8.5-*Salvia mellifera* (
9.0-*Artemisia californica*
9.5-*A. californica, S. xantii*
10.0-*A. californica, S. xantii*
10.5-*S. mellifera*
11.0-*S. xantii*
11.5-*S. xantii*
12.0-*Mimulus longiflorus*
12.5-*Poacea spp.*
13.0-*Poacea spp.*, *A. californica*
13.5-*Poacea spp.*, *A. californica*
14.0-*Poacea spp.*
14.5-*A. californica*, *Poacea spp.*
15.0-*A. californica*, *Poacea spp.*
15.5-*A. californica*, *Poacea spp.*
16.0-*A. californica*, *Poacea spp.*
16.5-*A. californica*, *Poacea spp.*
17.0-*A. californica*, *Poacea spp.*
17.5-*A. californica*, *Poacea spp.*
18.0-*A. californica*, *Poacea spp.*
18.5-*A. californica*, *Poacea spp.*
19.0-*A. californica*, *Poacea spp.*
19.5-*A. californica*, *Poacea spp.*
20.5-*A. californica*, *Poacea spp.*
21.0-*Poacea spp.*
21.5-*Poacea spp.*
22.0-*Poacea spp.*
22.5-*Poacea spp.*
23.0-*Poacea spp.*
23.5-*A. californica*
24.0-*A. californica*
24.5-*S. mellifera, A. californica*
25.0-*S. mellifera*

WRSP-1
0.5-*Rhus ovata* (
1.0-*R. ovata*
1.5-*R. ovata*
2.0-*R. ovata*
2.5-*Artemisia californica*
3.0-*A. californica*
3.5-*Encelia californica*
4.0-open
4.5-*A. californica*
5.0-*A. californica*
5.5-*A. californica*
6.0-open
6.5-*E. californica*
7.0-*E. californica*
7.5-*Hazardia venidus*
8.0-*H. venidus*
8.5-*H. venidus*
9.0-*Salvia mellifera*
9.5-*A. californica*
10.0-*A. californica*
10.5-*A. californica*
11.0-*S. mellifera*
11.5-*H. venidus*
12.0-*E. californica*
12.5-*E. californica*
13.0-trail
13.5-trail
14.0-*E. californica*
14.5-*S. mellifera*
15.0-*Eleymus condensatus*
15.5-*Artemisia californica*
16.0-*A. californica*
16.5-*A. californica*
17.0-*Erigonum cinerium*
17.5-*E. condensatus*
18.0-*E. condensatus*
18.5-*E. consdensatus*
19.0-*H. venidus*
19.5-*H. venidus*
20.0-*E. californica*
20.5-*E. condensatus*
21.0-*E. californica*
21.5-*E. cinerium*
22.0-*E. condensatus*
22.5-*E. condensatus*
23.0-*A. californica*
23.5-*A.californica*
24.0-*A. californica, E. condensatus, E. californica*
24.5-trail
25.0-trail

UCLA-2

0.5-*Stipa spp*. , *Artemisia californica*
1.0-*A. californica*
1.5-*Stipa spp*., *A. californica*
2.0-*Stipa spp*., *A. californica*
2.5-*Stipa spp*., *A. californica*
3.0-*Stipa spp*., *A. californica*
3.5-*Stipa spp*., *A. californica*
4.0-*Stipa spp*., *A. californica, Quercus dumosa*
4.5-*Stipa spp*., *A. californica*
5.0-*Stipa spp*., *A californica*
5.5-*Stipa spp*., *A. californica*
6.0-*Stipa spp*., *A. californica*
6.5-*A. californica*
7.0-*A. californica, Stipa spp., Encelia californica*
7.5-*A. californica*, *Rosmarinus officinalis*
8.0-*A. californica*, *R. officinalis*
8.5-*A. californica*, *R. officinalis*
9.0-*A. californica*
9.5-*Artemisia californica and Stipa spp*.
10.0-*A. californica, Stipa spp*., *Gnaphalium bicolor*
10.5-*A. californica, Stipa spp*., *G. bicolor*
11.0-*A. californica, Quercus*
11.5-*A. californica, Quercus spp*.
12.0-*A. californica, Quercus spp.*
12.5-*Quercus spp*.
13.0-*Quercus spp*.
13.5-*Quercus spp*. *Tucrium fruticans*
14.0-*Quercus spp*. *T. fruticans*
14.5-*Quercus spp*. *T. fruticans*
15.0-*Quercus spp*. *T. fruticans*
15.5-*Quercus*, *T. fruticans*, *Stipa spp*.
16.0-*Quercus*, *T. fruticans*
16.5-*Quercus*, *T. fruticans*, *Stipa spp*.
17.0-*Quercus*, *T. fruticans*, *Stipa spp*.
17.5-*Quercus*, *T. fruticans*, *Stipa spp., A. californica*
18.0-*A. californica*
18.5-*A. californica*
19.0-*A. californica*
19.5-*A. californica, Mimilus longiflorus*
20.0-*A. californica, Mimilus longiflorus*
20.5-*A. californica, Mimilus longiflorus*
21.0-*A. californica, Stipa* spp.
21.5-*A. californica*
22.0-*A. californica*
22.5-*A. californica, Stipa spp*.
23.0-Trail
23.5-*A. californica*
24.0-*A. californica*
24.5-*A. californica*
25.0-*A. californica, Stipa spp*.

WRSP-2

0.5-*Artemisia californica*
1.0-*A. californica*
1.5-*A. californica*
2.0-*A. californica*
2.5-*Erigonum cinerium*
3.0-*E. cinerium*
3.5-*E. cinerium*
4.0-*Prunus ilicifolia*
4.5-*P. ilicifolia*
5.0-*Encelia californica*
5.5-*E. californica*
6.0-*E. californica*
6.5-*Salvia mellifera*
7.0-*S. mellifera*
7.5-*S. mellifera*, *E. californica*, *Quercus dumos*
8.0-*A. californica*
8.5-*A. californica*
9.0-*A californica, Eleymus condensatus*
9.5-*E. condensatus*
10.0-*A. californica*
10.5-*A. californica*
11.0-*Malosma laurina*
11.5-*A. californica*
12.0-*A. californica*
12.5-*Mimulus longiflorus*
13.0-*Lotus scoparius*
13.5-*M. longiflorus*
14.0-*E. condensatus*
14.5-*E. cinerium*
15.0-*A. californica*
15.5-*A. californica*
16.0-*E. cinerium*
16.5-*E. cinerium*
17.0-*A. californica*
17.5-*A. californica*
18.0-*E. cinerium*
18.5-*E. cinerium*
19.0-*E. cinerium*
19.5-*E. cinerium*
20.0-*M. laurina*
20.5-*M. laurina*
21.0-*E. cinerium*
21.5-*E. cinerium*
22.0-*E. condensatus*
22.5-*E. condensatus*
23.0-*E. cinerium*
23.5-*E. cinerium*
24.0-*E. cinerium*
24.5-*E. cinerium*
25.0-*E. cinerium*

UCLA-3
0.5-*Calystegia macrostegia* (
1.0-*Malosma laurina C. macrostegia*
1.5-*M laurina*
2.0-*M. laurina*
2.5-*M. laurina*
3.0-*M. laurina*
3.5-*M. laurina*
4.0-*M. laurina*
4.5-*M. laurina*
5.0-*M. laurina*
5.5-*M. laurina*
6.0-*M. laurina*
6.5-*M. laurina, Brassica sp*.
7.0-*Nicotiana glauca*, *M. laurina*
7.5-*N. glauca., M laurina*
8.0-*N. glauca., M laurina*
8.5-*N. glauca., M. laurina*
9.0-*N. glauca., M. laurina*
9.5-*N. glauca., M. laurina*
10.5-*N. glauca., M. laurina*
11.0-*Ricinus communis*
11.5-*R. communis*
12.0-*N. glauca*
12.5-*N. glauca, M. laurina*
13.0-*N. glauca., M. laurina*
13.5-*N. glauca., M. laurina*
14.0-*N. glauca., M. laurina*
14.5-*N. glauca., M. laurina*
15.0-*N. glauca., M. laurina*
15.5-*N. glauca., M. laurina*
16.0-*N. glauca., M laurina*
16.5-*N. glauca., M. laurina*
17.0-*N. glauca., M. laurina*
17.5-*N. glauca., M. laurina*
18.0-*N. glauca., M. laurina*
18.5-*N. glauca., M. laurina*
19.0-*Nicotiana g., M. laurina, R. communis*
19.5-*M. laurina, R. communis*
20.0-*M. laurina, R. communis*
20.5-*M. laurina, R. communis*
21.0-*M. laurina, R. communis*
21.5-*Conyza spp*.
22.0-*Conyza spp, R. communis*
22.5-*Conyza, R. communis*
23.0-*R. communis,* and *N. glauca*
23.5-*N. glauca, Brassica sp*., *Conyza spp.*
24.0-*N. glauca.* and *Conyza spp.*
24.5-*N. glauca.* and *Conyza spp,*
25.0-*N. glauca*

WRSP-3
0.5-*Salvia mellifera*
1.0-*Eleymus condensatus*
1.5-*E. condensatus*
2.0-*E. cndensatus*
2.5-*E. condensatus*
3.0-*E. condensatus*
3.5-*Encelia californica*
4.0-*E. californica*
4.5-*E. californica*
5.0-*E. californica, S. mellifera*
5.5-*S. mellifera*
6.0-*E. californica, S. mellifera*
6.5-*E. californica, S. mellifera*
7.0-*E. californica, S. mellifera*
7.5-*S. mellifera*
8.0-*Artemisia californica*
8.5-*A. californica*
9.0-*A. californica, S. mellifera*
9.5-*E. californica, S. mellifera*
10.0-*A. californica*
10.5-*A. californica, S. mellifera*
11.0-*A. californica*
11.5-*A. californica*
12.0-*A. californica*
12.5-*Hazardia venidus*, *S. mellifera*
13.0-*S. mellifera*
13.5-*S. mellifera*
14.0-*S. mellifera*
14.5-*S. mellifera*
15.0-*A. californica*
15.5-*A. californica*
16.0-*A. californica*
16.5-*A. californica*
17.0-*H. venidus*
17.5-*A. californica*
18.0-*A. californica, H. venidus*
18.5-*A. californica*
19.0-*A. californica, H. venidus*
19.5-*A. californica*
20.0-*A. californica*
20.5-*A. californica*
21.5-*A. californica*
22.0-*A. californica*
22.5-*A. californica*
23.0-*H. venidus*
23.5-*H. venidus, A. californica*
24.0-*A. californica, E. californica*
24.5-*A. californica, H. venidus*
25.0-*A. californica, H. venidus*

APPENDIX B: PLANT COVER DATA

UCLA-1	**cover**
Cistus villosus	8.00
Artemisia californica	26.00
Calystegia macrostegia	1.00
Salvia melifera	7.00
Rhus laurina	4.67
Soalnum xantii	6.00
Mimulus longiflorus	2.00
Ceanothus sp.	5.33
Poaceae spp.	34.00
Hedera canariensis	4.00

UCLA-2	**cover**
Stipa sp.	38.33
Artemisia californica	48.17
Encelia californica	0.67
Rosmarinus officinalis	3.00
Gnaphalium bicolor	1.33
Quercus dumosa	15.17
unidentified flower	7.50
Mimulus longiflorus	3.00
open area	2.00

UCLA-3	**cover**
Calystegia macrostegia	3.00
Rhus laurina	49.67
Brassica sp.	1.67
Nicotiana glauca	28.33
Ricinus communis	11.67
Conyza sp.	5.67

UCLA Total	
Calystegia macrostegia	4.00
Rhus laurina	54.33
Brassica sp.	1.67
Nicotiana glauca	28.33
Ricinus communis	11.67
Conyza sp.	5.67
Stipa sp.	38.33
Encelia californica	0.67
Rosmarinus officinalis	3.00
Gnaphalium bicolor	1.33
Quercus dumosa	15.17
unidentified flower	7.50
Mimulus longiflorus	5.00
open area	2.00
Cistus villosus	8.00
Salvia melifera	7.00
Soalnum xantii	6.00
Ceanothus sp.	5.33
Poaceae spp.	34.00
Hedera canariensis	4.00
Artemisia californica	74.17

WRSP-1	**cover**
Malasoma ovata	8.00
Artemisia californica	26.67
Encilia californca	16.67
open area	12.00
Eleymeus condensatus	44.30
Salvia mellifera	6.00
Hazardia venidus	12.00
Erigonum cinerium	10.00

WRSP-2	**cover**
Artemisia californica	29.00
Erigonum cinerium	34.00
Prunus ilicifolia	4.00
Encelia californica	6.67
Salvia mellifera	4.67
Quercus dumosa	0.67
Eleymus condensatus	4.00
Rhus laurina	6.00
Mimulus longiflorus	4.00
Lotus scopanus	2.00

WRSP-3	**Cover**
Elymus condensatus	10.00
Salvia mellifera	22.00
Encelia californica	12.00
Artemisia californica	6.00
Hazardia venidus	10.00

WRSP Total	
Elymus condensatus	58.30
Salvia mellifera	32.67
Artemisia californica	61.67
Hazardia venidus	22.00
Rhus ovata	8.00
open area	12.00
Erigonum cinerium	44.00
Prunus ilicifolia	4.00
Quercus dumosa	0.67
Rhus laurina	6.00
Mimulus longiflorus	4.00
Lotus scoparius	2.00
Encelia californica	35.33

APPENDIX C: MAMMAL SURVEY DATA

Results of small mammal trapping habitat conservation plan site at UCLA.
CALIFORNIA: Los Angeles Co., Belagio Dr. and Veteran Avenue, 100 m Southwest of UCLA Child Care Center, Habitat Conservation Site at UCLA

19 February 1996
Transect #1
16 traps set along the lower part of the hill side besides de dirt road that leads to the construction facilies (See map for details):

Sta No.	Species	Common name	Sex	Age
2	*Neotoma fuscipes*	Dusky footed woodrat	Female	Adult
3	*Mus musculus*	House mouse	Male	Adult
3	*Mus musculus*	House mouse	Female	Adult

Total =3 small mammals

Transect #2
16 traps set along back part of the site leading up to the top of the hill:

Sta No.	Species	Common name	Sex	Age
11	*Neotoma fuscipes*	Dusky footed woodrat	Male	Adult
15	*Mus musculus*	House mouse	Male	Adult

Total= 2 small mammals

TOTAL SMALL MAMMAL CAPTURED= 5/32 TN*= 15.6% TRAP SUCCESS

3 March 1996
Transect #1
18 traps set along the lower part of the hill side besides de dirt road that leads to the construction facilies (See map for details):

Sta No.	Species	Common name	Sex	Age
6	*Rattus norvegicus*	Brown Rat	Unknown	Adult
9	*Neotoma fuscipes*	Dusky footed woodrat	Female	Adult

Total =2 small mammals

Transect #2
14 traps set along back part of the site leading up to the top of the hill:
No small mammals were captured

TOTAL SMALL MAMMAL CAPTURED= 2/32 TN*= 6.25% TRAP SUCCESS

Results of small mammal trapping conducted by Jesus E. Maldonado (1994) at a comparable habitat site in the Santa Monica Mts.

CALIFORNIA: Los Angeles Co., Santa Monica Mts., Leo Carrillo State Beach.

5 March 1994
Transect #1
15 traps set along the canyon yielded the following:

Number	Species	Common name	Sex	Age
2	*Peromyscus californicus*	Parasitic mouse	Male	Adult
3	*Peromyscus californicus*	Parasitic mouse	Female	Adult
1	*Peromyscus boylii*	Brush mouse	Male	Adult
1	*Peromyscus boylii*	Brush mouse	Female	Adult
1	*Neotoma fuscipes*	Dusky footed woodrat	Male	Adult
1	*Neotoma fuscipes*	Dusky footed woodrat	Female	Adult

Total =9 small mammals

Transect #2
18 traps set along Arroyo Sequit yielded the following:

Number	Species	Common name	Sex	Age
5	*Peromyscus boylii*	Brush mouse	Male	Adult
3	*Peromyscus boylii*	Brush mouse	Male	Sub-Adult
3	*Peromyscus boylii*	Brush mouse	Female	Adult
1	*Neotoma fuscipes*	Dusky footed woodrat	Unknown	Adult

Total= 12 small mammals
TOTAL SMALL MAMMAL CAPTURED= 21/33 TN*= 63.6%

6 March 1994
Transect #1
15 traps set along the canyon yielded the following:

Number	Species	Common name	Sex	Age
3	*Peromyscus californicus*	Parasitic mouse	Unknown	Adult
6	*Peromyscus boylii*	Brush mouse	Unknown	Adult
4	*Neotoma fuscipes*	Dusky footed woodrat	Unknown	Adult

Total =13 small mammals - 4 recaptures= 9 new small mammals
Transect #2

18 traps set along Arroyo Sequit yielded the following:

Number	Species	Common name	Sex	Age
6	*Peromyscus boylii*	Brush mouse	Unknown	Adult
2	*Peromyscus californicus*	Brush mouse	Unknown	Adult
2	*Neotoma fuscipes*	Dusky footed woodrat	Unknown	Adult

Total= 10 small mammals (no recaptures).

TOTAL SMALL MAMMAL CAPTURED= 12/33 TN*= 36.4% TRAP SUCCESS

APPENDIX D: HISTORICAL BIRD DATA

Birds species recorded at UCLA in the 1920s (species in bold specifically recorded from West Terrace) (Vogel 1968)

1. Eared grebe *Podiceps caspicus*
2. Great blue heron *Ardea herodias*
3. Green heron *Butorides virescens*
4. Black-crowned night heron *Nycticorax nycticorax*
5. White-fronted goose *Anser albifrons*
6. Lesser scaup *Aythya affinis*
7. Sora *Porzana carolina*
8. American coot *Fulica americana*
9. Killdeer *Charadrius vociferus*
10. Wilson's snipe *Capella gallinago*
11. Greater yellowlegs *Totanus melanoleucus*
12. California gull *Larus californicus*
13. Ging-billed gull *L. delawarensis*
14. Glaucous-winged gull *L. Glaucescens*
15. Turkey vulture *Cathartes aura*
16. White-tailed kite *Elanus leucurus*
17. Sharp-shinned hawk *Accipter striatus*
18. Cooper's hawk *A. cooperii*
19. Red-tailed hawk *Buteo jamaicensis*
20. Marsh hawk *Circus cyaneus*
21. Osprey *Pandion haliaetus*
22. Prairie falcon *Falco mexicanus*
23. Sparrow hawk *F. sparverius*
24. California quail *Callipepla californicus*
25. Mourning dove *Zenaidura macroura*
26. Roadrunner *Geococcyx californianus*
27. Barn owl *Tyto alba*
28. Screech owl *Otus asio*
29. Pacific or great horned owl *Bubo virginianus*
30. Burrowing owl *Speotyto cunicularia*
31. Lesser nighthawk *Chordeiles acutipennis*
32. Vaux's swift *Chaetura vauxi*
33. White-throated swift *Aeronautes saxatalis*
34. Black-chinned hummingbird *Archilochus alexandri*
35. Coasta's humming bird *Calypte costae*
36. Anna's hummingbird *C. anna*
37. Rufous hummingbird *Selasphorus rufus*
38. Allen's hummingbird *S. sasin*
39. Red-shafted flicker *Colaptes cafer*
40. California or acorn woodpecker *Melanerpes formicivorus*
41. Hairy woodpecker *Dendrocopos villosus*
42. Nuttall's woodpecker *D. nuttallii*
43. Ash-throated flycatcher *Myiarchus cinerascens*
44. Black phoebe *Sayornis nigricans*
45. Say's phoebe *S. saya*
46. Western flycatcher *Empidonax difficilis*
47. Western wood pewee *Contopus sordidulus*
48. Horned lark *Eremophila alpestris*
49. Rough-winged swallow *Stelgidopteryx ruficollis*
50. Cliff swallow *Petrochelidon pyrrhonota*
51. Western or purple martin *Progne subis*
52. California or scrub jay *Aphelocoma coerulescens*
53. American or common raven *Corvus corax*
54. Western or common crow *C. brachyrhynchos*

55. Plain titmouse *P. inornatus*
56. Coast or common bushtit *Psaltriparus minimus*
57. Wrentit *Chamaea fasciata*
58. House wren *Troglodytes aedon*
59. Bewick's wren. *Thryomanes bewickii*
60. Mocking bird *Minus polyglottos*
61. California thrasher *Toxostoma redivivum*
62. Robin *Turdus migratorius*
63. Hermit thrush *Hylocichla guttata*
64. Western bluebird *Sialia mexicana*
65. Western or blue-gray gnatcatcher *Polioptila caerulea*
66. Ruby-crowned kinglet *Regulus calendula*
67. American or water pipit *Anthus spinoletta*
68. Phainopepla *Phainopepla nitens*
69. California or loggerhead shrike *Lanius ludovicianus*
70. Least Bell's vireo *V. bellii*
71. Yellow warbler *Dendroica petechia*
72. Audubon's warbler *D. auduboni*
73. Black-throated gray warbler *D. nigrescens*
74. Hermit warbler *D. occidentalis*
75. Townsend's warbler. *D. Townsendi*
76. Yellowthroat *Geothlypis trichae*
77. Yellow-greasted or long-tailed chat *Icteria virens*
78. Wilson's warbler *Wilsonia pulsilla*
79. Western meadowlark *Sturnella neglecta*
80. Yellow-head black bird *Xanthocephalus xanthocephalus*
81. Red winged blackbird *Agelaius phoeniceus*
82. Hooded oriole *Icterus cucullatus*
83. Brewer's blackbird *Euphagus cyanocephalus*
84. Brown-headed cowbird *Molothrus ater*
85. Western tanager *Piranga ludoviciana*
86. Black-headed grosbeak *Pheucticus melanocephalus*
87. Blue grosbeak *Guiraca caerulea*
88. Purple finch *Carpodacus purpureus*
89. House finch *C. mexicanus*
90. American goldfinch *S. tristis*
91. Lesser goldfinch *S. psaltria*
92. Rufous-sided towhee *Pipilo erythrophthalmus*
93. Brown towhee *P. fuscus*
94. Oregon junco *Junco oreganus*
95. Fox sparrow *Pooecetes gramineus*
96. Lincoln's sparrow *Melospiza lincolnii*
97. Song sparrow *M. melodia*
98. Lark sparrow *Chondestes grammacus*
99. Gambel or white-crowned sparrow *Zonotrichia leucophrys*
100. Golden-crowned sparrow *Zonotrichia atricapilla*

New species of birds recorded at UCLA, 1927–1944 (Vogel 1968)

1. Double-crested cormorant *Phalacrocorax auritus*
2. Long-billed curlew *Numenius americanus*
3. Spotted dove *Streptopelia chinensis*
4. Rock dove or domestic pigeon *C. livia*
5. Belted kingfisher *Megaceryle alcyon*
6. Western kingbird *Tyrannus verticalis*
7. Barn swallow *Hirundo rustica*
8. Swainson's or russet-backed thrush *H. ustulata*
9. Orange-crowned or lutescent warbler *Vermivora celata*
10. Cedar waxwing *Bombycilla cedrorum*
11. Bullock's Oriole *I. bullickii*
12. Lazuli bunting *Passerina amoena*
13. Lawrence's goldfinch *S. lawrencei*

14. Slate-clolred junco *Junco hyemalis*
15. Rufous-crowned sparrow *Aimophila ruficeps*

Bird species returned (*) and invaded (**) West Terrace after the fire-resistance program (Vogel 1968)

1. Killdeer *Charadrius vociferus***
2. Cooper's hawk *A. cooperii***
3. California quail *Lophortyx californicus**
4. Nuttall's woodpecker *D. nuttallii***
5. Cliff swallow *Petrochelidon pyrrhonota***
6. Plain titmouse *P. inornatus***
7. Coast or common bushtit *Psaltriparus**
8. Bewick's wren *Thryormanes bewickii***
9. Robin *Turdus migratorius**
10. Western or blue-gray gnatcatcher *Polioptila caerulla**
11. California or loggerhead shrike *Lanius ludovicianus***
12. Hermit warbler *D. occidentalis***
12. Western tanager *Piranga ludoviciana***
13. Black-headed grosbeak *Pheucticus melanocephalus**

APPENDIX E: HISTORICALLY PRESENT ARTHROPODS

Phylum Arthropoda
Class Insecta
Primative wingless insects
Order Collembola (springtails)
Morulina multatuberculata
Isotoma viridis
Order Zygentoma (silverfish)
*Ctenolepisma lineata pilifera***x**
Order Microcoryphia (bristletails)
Machilis sp. 1
Primative winged insects
Order Ephemeroptera (mayflies)
Callibaetis pacificus
Baetis sp.
Order Odonata (Dragonflies, damselflies)
(Family Calopterygidae)
Hetaerina americana
(Family Lestidae)
Archilestes californica
Archilestes grandis
Lestes congener
(Family Coenagrionidae)
Amphiagrion abbreviatum
Argia agrioides
Argia hinei
Argia lugens
Argia moesta
Argia nahuana
Argia sedula
Argia vivida
Enallagma boreale
Enallagma carunculatum
Enallagma civile
Enallagma c. cyathigerum
Enallagma praevarum
Ischnura cervula
Ischnura denticollis
Ischnura perparva
Telebasis salva
(Family Aeshnidae)
Aeshna californica
Aeshna multicolor
Aeshna walkeri
Anax junius
Anax walsinghami
(Family Gomphidae)
Erpetogomphus compositus
Erpetogomphus l. lampropeltis
Octogomphus specularis
Progomphus borealis
(Family Cordulegastridae)
Cordulegaster dorsalis
(Family Lebellulidae)
Brachymesia furcata
Brechmorhoga mendax
Erythemis simplicicollis
Libellula forensis
Libellula lydia
Libellula noodisticta
Libellula pulchella
Libellula saturata
Libellula subornata
Macrothemis imitans leucozona
Pachydiplax longipennis
Paltothemis lineatipes
Pantala flavescens
Pantala hymenaea
Sympetrum c. corruptum
Sympetrum illotum
Tramea lacerata
Tramea onusta
Orthopteroids
Order Embiidina (webspinners)
Genus and spp. undet.
Order Dermaptera (earwigs)
*Euborellia annulipes***x**
*Forficula auricularia***x**
Order Orthoptera (grasshoppers, crickets)
(Family Acrididae)
Trimeroptropis pallidipennis
Schistocerca nitens
(Family Gryllidae)
Oecanthus sp.
Gryllus sp.
*Acheta domesticus***x**
(Family Tettigoniidae)
Microcentrum rhombifolium
Scudderia mexicana
Platylyra californica
Idiostatus aepualis
(Family Rhaphidophoridae)
Ceuthophilus californianus
Pristoceuthophilus sp.
Gammarotettix genitalis
(Family Stenopalmatidae)
Stenopelmatus fuscus
Order Blattodea (cockroaches)
Periplaneta americana
Blatta orientalis **x**
Blattella germanica **x**
Supella longipalpa
Parcoblatta americana
Order Mantodea (praying mantids)
Stagmomantis californica
Litaneutria minor
Iris oratoria **x**
Order Phasmatodea (phasmids)
Pseudosermyle straminea
Parabacillus herperus
Temema sp.
Order Isoptera (termites)
(Family Rhinotermitidae)
Reticulitermes hesperus
(Family Kalotermitidae)
Incisitermes minor
(Family Hodotermitidae)
Zootermopsis anngusticollis
Psocids and lice
Order Psocoptera (bark lice)
(Family Liposcelididae)
Trogium sp.
Liposcelis sp.
Order Anoplura (sucking lice)
(Family Pediculidae)
Pediculus humanus
P. sp.
Order Mallophaga (chewing lice)
(Family Mallophaga)
Menacanthus stramineus
True bugs and Homoptera
Order Heteroptera (true bugs)
(Family Pentatomidae)
Chlorochroa uhleri
C. sayi
Murgantia histrionica
(Family Coreidae)
Anasa tristis
(Family Lygaeidae)
Lygaeus kalmii
Blissus insularis
Nyssius raphanus
(Family Rhopalidae)
Boisea rubrolineata
(Family Largidae)
Largus cinctus californicus
(Family Reduviidae)
Triatoma protracta
Apiomerus crassipes

Rasahus thoracicus
(Family Tingidae)
Corythuca ciliata confraternus
(Family Cimicidae)
Cimex lectularius
Oeciacus vicarius

Order Homoptera (leafhoppers, aphids, scales)

(Family Cicadidae)
Tibicinoides cupreosparsus
Platypedia laticapitata
Okanagana vanduzeei
(Family Cicadellidae)
Graphocephala atropunctata
Homalodisca lacerta
(Family Cercopidae)
Aphrophora sp.
Aphrophora permutata
(Family Membracidae)
Antianthe expansa
(Family Flatidae)
Siphanta acuta
(Family Aphididae)
Microsiphum rosae
Cinara curvipes
Pterochlorus viminalis
Myzus persicae
Aphis gossypii
(Family Diaspididae)
Aonidiella aurantii **x**
Aspidiotus nerii
Hemiberlesia lataniae
(Family Coccidae)
Coccus hesperidum
(Family Eriococcidae)
Glossyparia spuria
(Family Pseudococcidae)
Pseudococcus longispinus
(Family Dactylopiidae)
Dactylopius opuntiae
D. confusus
(Family Aleyrodidae)
Aleuroplatus coronata
Tetraleurodes mori
Trialeurodes vaporariorum
Aleurothrixus floccosus
Siphoninus phillyreae **x**
(Family Psyllidae)
Calophya schini **x**
Trioza eugenii **x**

Order Thysanoptera (thrips)

Frankliniella occidentalis
Heliothrips haemorrhoidalis
Scirtothrips citri
Gynaikothrips ficorum
Haplothrips mali

Holometabola (insects with complete metamorphosis)

Order Strepsiptera (twisted-winged insects)

Stylops spp.

Order Neuroptera (nerve winged insects)

(Family Corydalidae)
Neohermes callifornicua
(Family Rhapidiidae)
Agulla sp.
(Family Chrysopidae)
Chrysoperla plorabunda
(Family Hemerobiidae)
Hemerobius sp.
(Family Myrmelionidae)
Brachynemurus sp.
Myrmelion sp.

Order Trichoptera (caddisflies)

(Family Sericostomatidae)
Grumaga griseola

Order Lepidoptera (moths and butterflies)

(Family Incurvaridae)
Tegiticula maculata
(Family Ethiidae)
Genus and sp. undet.
(Family Blastodbasidae)
Holocera gigantella
H. sp.
(Family Cossidae)
Giveria marga
Prionoxystus robineae
(Family Tortricidae)
Argyotaenia citrana
(Family Limacodidae)
Monoleuca occidentalis
(Family Pyralidae)
Hellula rogatalis
Dicymolomia metallifera
Uresiphita reversalis
(Family Pterophoridae)
Platytilia carduidactyla
P. williamsii
Anstenoptilia marmarodactyla
Emmelina monodactyla
(Family Geometridae)
Itame quadrillnearia
I. extemporata
I. guenearia
Semiothisa aspirata
S. excurvata
S. curvata
S. californiaria
S. colorata
S. naptaria
Hesperumia sulphuraria
Tornos erectarius fieldi
Glaucina epiphysaria
Hulstina wrightiaria
H. inconspicua
Pterotaea lamiaria
P. melanocarpa
P. newcombi
Anacamptodes fragilaria
A. profanata
Anavitrinelia ocularia
Phigalia plumogeraria
Paleacrita longiciliata
Lomographa elsinora
Drepanulatrix unicalcararia
D. hulstii
D. bifiliata
D. quadraria
D. falcataria
D. monicaria
Pero (Apapanaria) radiosaria
P. macdunnoughi
Aethaloida packardaria
Parexcelsa ultraria
Slossonia rubritincta
Neoterpes edwardsata
Sicya macularia lewisi
S. snoviaria
Plataea personaria
Eusarca falcata
Pherne subpunctata
Synaxis cervinaria
Synaxis hirsutaria
Prochoerodes forficaria
Sabulodes aegrotata
Chlorosea banksaria gracearia
Nemoria darwiniata punstularia
N. leptalea (=delicataria)
Dichorda illustraria
Synchlora aerata liquoraria
Cheteoscelis faseolaria
Chlorochlamys appellaria (=hesperia)
Idaea sp.
Idaea bonifata
Cyclophora dataria
C. nanaria
Scopula junctaria quinquelinearia
Dysstroma mancipata hulstata
Eustroma semiatrata
Hydriomena edenata
H. albifasciata
H. nubilofasciata
Triphosa californiata
Archiroe neomexicana
Spargania magnoliata
Stamnodes albiapicata
S. affiliata
S. annellata
S. coenonymphata
S. cassinoi
Staminoctenes ululata

S. costimaculata
Epirrhoe plebeculata
Zenophelps lignicolorata
Z. obscurata
Orthonama obstipata
Venusia duodecemlineata
Operophtera occidentalis
E. misturata
E. macdunnoughi
E. rotundopuncta
E. segregata
E. mystiata
E. gilvipennata
E. acutipennis
E. shirleyata
E. nevadata
Nasusina inferior
N. vaporata
Trichopteryx veritata
(Family Lasiocampidae)
Tolype lowriei
Phyllodesma americana californica
Gloveria medusa
(Family Saturniidae)
Anthraea polyphemus
Hyalophora euryalus
(Family Sphingidae)
Sphinx perelegans
Smerinthus cerisyi
Hemaris diffinis
Eumorpha achemon
Hyles lineata
(Family Notodontidae)
Furcula cirierea
Schizura unicornis
(Family Dioptilidae)
Phyganidia californica
(Family Arctiidae)
Estigmene acrea
Spilosoma vestalis
Arachnis picta
Apantesis ornata
A. proxima
Hemihyalea edwardsii
Ctenucha brunnea
(Family Noctuidae)
Idia lubricalis occidentalis
Tetanolita palligera
Mycterophora geometriformis
Hemeroplanis finitinia
Litoprosopus coachella
Cissusa indiscreta
Melipotis indomita
Forsebia perlaeta
Bulia similaris
Synedoida ochracea
S. edwardsi
S. pallescens
S. fumosa brunnifasciata
S. divergens socia
S. tejonica
Ascalapha odorata
Zale lunata salsis
Zale termina
Caenurgia togataria
Catocala piatrix
C. aholibah
C. verrilliana
Mouralia tinctoides
Trichoplusia ni
Pseudoplusia includens
Autoplusia egena
A. olivacea
Autographa biloba
A. californica
Paectes declinata
Meganola miniscula eucalypta
Nola minna
Tarachidia candefacta
Conochares acutus
C. alter
C. elegantulus
Acontia cretata
Acronicta marmorata
A. impleta
A. othello perdita
Alypia ridingsii
Apamea cuculliformis
A. albina
A. cinefacta
Oligia marina
O. tusa
Mammifrontia rileyi
Helotropha reniformis
Aseptis fumosa
A. perfumosa
A. binotata
A. susquesa
Properigia albimacula
Pseudobryomina fallax
Protoperigae posticata
Spodoptera exigua
S. frugiperda
S. praefica
S. ornithogalli
Galgula partita
Platysenta albolabes
Cosmia calami
Zotheca tranquilla
Annaphila pseudoastrologa
Homoglaea carbonaria
Lithophane contenta
Pseudoglaea olivata
Agrochola purpurea
Feralia februalis
Pleromelloida cinerea
Neogalea esula
Catabena lineolata
C. sagittata
Homoncocnemis fortis
Oncocnemis singularis
O. ragani
Lepipolys perscripta
Behernsia conchiformis suffusa
Rancora serraticornis
R. comstocki
Cucullia dentilinea
Copicucullia eulepis
Discestra trifolii
Scotogramma deffessa
Trichoclea antica
Polia montara
Admetovis similaris
Lacinipolia cuneata gertana
L. pensilis
L. stricta tensica
L. illaudibilis
L. quadrilineata
L. patalis
Dargida procinta
Pseudaletia unipuncta
Leucania oaxacana
Perigonia tertia
Acerra normalis
Stretchia inferior
Orthosia erytholita
O. transparens
O. praeses
O. ferrigera
O. macona
O. arthrolita
O. pacifica
O. hibisci quinquefasciata
Egira hiemalis
E. crucialis
E. curialis indurata
E. rubrica
E. perlubens
Anhimella perbrunnea
Homorthodes communis
H. hanhami semicarnea
Protorthodes rufula
O. alfkeni
O. variabilis
O. melanopis
Ulolonche disticha
Zosteropoda hitirpes
Miodera stigmata
Tricholita fistula
Agrotis ipsilon
Feltia geniculata
Euxoa fuscigera
E. atomeris
E. auxiliaris
E. septentionalis
E. olivia
E. medialis
E. brevipennis
E. cicatricosa
E. redimicula
Pseudorthosia variabilis
Hemieuxoa redens
Peridromia saucia
Spaelotis havilae
Xestia adela
Anomogyna infimatis

Adelphagrotis indeterminata innotabilis
Abagrotis trigona
A. mirabilis
A. denticulata
A. barnesi
Rhynchagrotis exertisigma
Heliothis zea
H. virescens
H. phloxiphagus
H. paradoxus
Schinia aurantiaca
Schinia buta

Order Diptera (flies)

(Family Tipulidae)
Tipula planicornis
Holorusia hespera
(Family Culicidae)
Culex quinquefasciatus
Culex tarsalis
Culex peus
Culex erythrothorax
Culiseta inornata
Culiseta incidens
Aedes sierrensis
Anopheles franciscanus
Anopheles hermsi
(Family Simulidae)
Simulium spp.
(Family Ceratopogonidae) ?
(Family Rhagionidae)
Symphorimya limata
(Family Sciaridae)
Bradysia impatiens
(Family Bibionidae)
Dilophus orbatus
(Family Psychodidae)
Clogmia albiqunctata
Psychopda alternaria
(Family Bombyliidae)
Bombylius lancifer
Bombylius diegoensis
Bombylius major
Bombylius albicapilis
Bombylius breviabdominalis
Bombylius curtirynchus
Triploechus sp. (novus?)
Heterostylum robustum
Lordotus ermae
Lordotus planus
Geminaria canalis
Paracosmus sp. 2
Aphoebantus interruptus
Aphoebantus sscalaris
Aphoebantus conurus
Aphoebantus mus mus
Phthiria sp 1
Phthiria sp 2
Phthiria sp 3
Oligodrames sp. *(maculatus?)*
Pantarbes megistus/capito? x
Geron n. sp. *(nigripes)*
Xenox simson habrosus
A.nthrax varicolor
A. stellans
A. irroratus
A. sp. 1
Toxophora virgata
Exepacmus sp. 1
Conophorus cristatus
Conophorus fenestratus
C. nigripennis
C. atratulus
Thevenemyia affinus
Thevenemyia luctifera
Thevenemyia notata
T. tridentata
Villa lateralis
Villa sp. 1
Paravilla edititoides
P. aridula
P. fulvicoma
P. californica
P. tricellula
P. sp. 1
Chrysanthrax atrata
Chrysanthrax miscella
Chrysanthrax vana
Chrysanthrax edititia
Chrysanthrax sp. 1
Thyridanthrax nugator
T. pallida pallida
T. andrewsi
Hemipenthes eumenes
H.lepidota
H. sinuosa jaennickeana
H. inops
H. pullata
H. sp. 1
H. sp 2
H. sp. 4
Astrophanes sp. 1
Neodiplocampta mira
Poecilanthrax arcthusa
P. littoralis
P. tanbarkensis
E. doris
E. jonesi
(Family Asilidae)
Asilis sp.
Bombomima sackeni
Callinicus calcaneus
Callinicus (Chrysoceria pictitarsis)
Chrysoceria pictitarsus
Dioctria (Eudioctria) sp.
Efferia inflata
Efferia sp. *(small)*
Eudioctria doani
Heteropogon cirrhatus
Laphria trux
L. coquilleti
Leptogaster sp.
Mallophora fautrix (f. fautricoides)
Nicocles sp. 2
Pritchardomyia vespoid
Proctocanthus occidentalis
Sarcopogon luteus
Sarcopogon sp.
Stenopogon californicus
Stenopogon breviusculus
Stenopogon sp. 2
(Family Acroceridae)
Eulonchus smaragdinus
(Family Conopiodae)
Zodion sp.
(Family Stratiomyidae)
Hermetia illucens
Odontomyia (Catatasina) sp.
Sargus viridis
Dieuryneura callosa
Hermetia illucens
(Family Tabanidae)
Pilimas californicus beaameri
Stonemyia abrureus
Apatolestes sp.
Tabanus laticeps
T. kessel
T. punctifer
(Family Therevidae)
Thereva comata
T. cingulara
Nebritus pellucidus
Metaphragma planiceps
Genus and sp. 3
Genus and sp. 4
Genus and sp. 6
(Family Syrphidae)
Allograpta obliiqua
Allograpta sp. 1
Baccha clavata
Baccha lemur
Chrysotoxum sp.
Copestylum marginatum
Eristalis tenax
Eristalis arbustorum
Eumerus strigatus
Syrphus sp. 2
Volucella tau
Volucella avida
Volucella haagi
Xylota ???sp.
Tenthredomyia sp. *?tridens*
(Family Tachinidae)
Archytus apicifer
(Family Muscidae)
Musca domestica
Stomoxys calcitrans
Muscina stabulans
Fannia canicularis
Fannia benjamini
(Family Agromyzidae)
(Family Sarcophagidae)
Parasarcophaga spp.
(Family Calliphoridae)
Phaenicia sericata
P. cuprina

Eucalliphora lilaea
Calliphora vicina
Phormia regina
Paralucilia wheeleri
Pollenia rudis
Chrysomya megacephala
Chrysomya rufifacies
(Family Cuterebridae)
Cuterebra latifrons
Oestris ovis
(Family Drosophilidae)
Drosophila .(10 or more spp.)
D. melanogaster
D. simulans
(Family Tephritidae)
Ceratitis capitata
Dacus darsalis
Anastrepha ludens
Rhagoletis completa
(Families Anthomyiidae)
Fucellia
Coelopa
(Family Phoridae)
Megaselia scalaris
(Family Coelopidae)
Conicera tibialis
(Family Hippoboscidae)
Lipoptena depressa
Pseudolynchia canariensis

Order Siphonaptera (fleas)

Leptopsylla segnis
Ctenocephalides felis
Echidnophaga gallinacea
Leptopsylla segnis
Diamanus montanus
Nosopsyllus fasciatus
Malaraeus telchinus
Cediopsylla inaepualis

Order Coleoptera (beetles)

(Family Carabidae)
+*Amara* sp.
Bembidion
+*Pterostichus* sp. 1
+*Pterostichus* sp. 2
Pristonychus complanatus
Tanystoma maculicolle
+*Calathus ruficollis*
+*Scaphinotus* sp.
Calosoma semilaeve
Brachinus
Chlaenius
(Family Cicindelidae)
Cicindela oregona
(Family Staphylinidae)
Staphylinus olens
Sepedophilus
Genus and sp. 1
(Family Elateridae)
Genus and sp. 1
Genus and sp. 2
(Family Anobiidae)
Stegobium panaceum
Lasioderma serricorne
(Family Sylvanidae)
Oryzaephilus surinamensis
O. Mercator
(Family Melyridae)
Collops sp.
(Family Tenebrionidae)
Tribolium
Cratidus osculans
Eleodes dilaticollis
Eleodes acuticauda
Eleodes grandicollis
Eleodes sp. 1
Nyctoporis sp.
Pheliodid sp.
Genus and sp. 1
(Family Coccinellidae)
Hippodamia convergens
Adalia bipunctata
Coccinella californica
Olla v-nigrum
Chilocorus orbus
Cryptolaemus montrouzieri **x**
Rodolia cardinalis **x**
(Family Zopheridae)
Phloeodes pustulosus
(Family Histeridae)
Genus and sp. 1
(Family Cantharidae)
Cantharis consors
(Family Meloidae)
Lytta sp.
(Family Colytidae)
Genus and sp. 1
(Family Cleridae)
Genus and sp. 1
(Family Lampyridae)
Microphotus angustus
Ellychnia californica
(Family Scarabaeidae)
Scarabeus sacer
Pleocoma puncticollis
Cotinus mutabilis
Polyphylla decemlineata
P. crinita
Serica spp.
Phobetus spp.
Parathyce palpalis
Cyclocephala spp.
(Family Dermestidae)
Attagenus spp.
Anthrenus spp.
Trogoderma spp.
(Family Scolytidae)
Ips paraconfuscus
Ips confusus
(Family Bostrichidae)
Polycaon stouti
(Family Lyctidae)
(Family Cerambycidae)
Ipochus fasciatus
Prionus californicus
Xylotrechus nauticus
Tetraopes basalis
Rosalia funebris
Phoracantha semipunctata
(Family Chrysomelidae)
Chaetocnema repens
Diabrotica undecimpunctata
Xanthogaleruca luteola
Chrysochus auratus cobaltinus
(Family Curculionidae) Weevils
Scyphophorus yuccae
Asynonychus godmanni **x**
Otiorhynchus cribricollis **x**
Listroderes costirostris **x**
Listroderes difficilis **x**
Sitophilus sp. **x**

Order Hymenoptera

(Family Formicidae)
Iridomyrmex humilis **x**
Conophorus sp.
es pilicornis
Pogonomyrmex californicus
Solenopsis xyloni
Solenopsis molesta
Monomorium minimum
Liometopum occidentale
Camponotus sp.
Crematogaster sp.
(Family Tenthredinidae)
(Family Vespidae)
Vespula pensylvanica
Polistes fuscatus aurifer
(Family Sphecidae)
Sceliphron caementarium
Chalybion californicum
Bembix comata
Tachysphrex sp.
(Family Pompilidae)
Pepsis chrysothymus
(Family Mutillidae)
Dasymutilla californica
(Family Chrysididae)
(Family Cynipidae)
Callirhytis puercuspomiformis
Andricus puercuscalifornicus
(Family Ichneumonidae)
Ophion sp.
(Family Aphidiidae)
Aphidius sp.
(Superfamily Chalcidoidea)
Blastophaga sp.
(Family Pteromalidae)
Muscidifurax sp.
(Family Encyrtidae)
Aphytis spp.
(Family Trichogrammatidae)
Trichogramma sp.
(Family Tiphiidae)
Brachycistis sp.
(Family Siricidae)
Sirex longicauda

Sirex aureolatus
(Family Megachilidae)
Megachile sp.
(Family Helictidae)
Agapostemon texana
Augochlorella sp.
(Family Anthophoridae)
Xylocopa varipuncta
Xylocopa californica
Xylocopa tabaniformis
(Family Apidae)
Bombus sonorus
Bombus californicus
Bombus vosnesenskii
Bombus crotchii
Apis mellifera n **x**
Apis mellifera scutellata

ARACHNIDS

Order Scorpionida (scorpions)

(Family Vejovidae)
Anuroctonus phaiodactylus
Paruroctonus silvestrii
Vejovis spp.

Order Solpugida (sun spiders)

(Family Eremobatidae)
Hemerotrecha marginata
Therobates morrisi
Eremobates sp.

Order Opiliones (daddy long-legs)

Protolophus singularis
Leuronychus pacificus

Order Araneae (spiders)

(Family Theraphosidae)
Bothriocyrtum californicum
(Family Ctenizidae)
Aphonopelmus eutylenum
Aphonopelmus reversum
(Family Dysderidae)
Dysdera crocota
(Family Theridiidae)
Latrodectus hesperus
Steatoda grossa
Achaearanea tepidariorum
(Family Pholcidae)
Pholcus phalangioides
(Family Clubionidae)
Chiracanthium mildei
Chiracanthium inclusum
(Family Gnaphosidae)
Scotophaeus blackwalli
(Family Agelenidae)
Hololena curta
(Family Araneidae)
Argiope aurantia
A. trifasciata
A. argentata
Neoscona oxacensis
Araneus gemmus
Cyclosa turbinata
(Family Salticidae)
Phidippus formosus
(Family Oxyopidae)
Peucetia viridans
(Family Thomisidae)
Misumenoides formosipes

Order Acari (mites)

(Family Tetranychidae)
Panonychus citri
Eotetranychus sexmaculatus
Tetranychus urticae
Bryobia praetiosa
(Family Eriophyidae)
Phyllocoptruta oleivora
(Family Tarsonemidae)
Stenotarsonemus pallidus
(Family Acaridae)
Acarus sp.
Tyrophagus spp.
(Family Macronyssidae)
Ornithonyssus bacoti
Ornithonyssus sylviarum
Ornithonyssus bursa
Allodermanyssus sanguineus
Dermanyssus gallinae
(Family Trombiculidae)
Eutrombicula belkini
Euschoengastia
Neotrombicula
Odontacarus
(Family Trombidiidae)
Angelothrombium spp.
(Family Demodicidae)
Demodex follicularum
(Family Pyroglyphidae)
Dermatophagoides spp.
(Family Sarcoptidae)
Sarcoptes scabiei
Knemidokoptes pilae
K. mutans
Dermatophagoides farinae
Galumna humida
Notaspis pectinata
(Family Ixodidae)
Ixodes pacificus
Dermacentor occidentalis
Dermacentor variabilis
Rhipicephalus sanguineus
Haemaphysalis leporispalustris
(Family Argasidae)
Ornithodoros coriaceus
Argas persicus
Otobius megnini

OTHER ARTHROPODS

Class Chilopoda (centipedes)

Scutigera coleoptrata
Scolopendra polymorpha

Class Diplopoda (millipedes)

Hiltonius pulchrus
Tylobolus claremontus
Atopetholus californicus

CRUSTACEA

Order Isopoda (pillbugs)

Armadillidium vulgare
Porcellio laevis

Order Amphipoda (amphipods)

Talitroides sylvaticus

MOLLUSCA

Order Gastropoda (snails)

(Family Helicidae)
Helix Aspersa
(Family Limacidae)
Agriolimax reticulatum