ARTHROPODS of the BALDWIN HILLS

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ABSTRACT

We surveyed the arthropod fauna of the Baldwin Hills, Los Angeles County, California during June and July 2000, with additional opportunistic sampling in April and May. We focused our survey efforts among the coastal scrub and riparian habitats of the Kenneth Hahn State Recreation Area (KHSRA). The results of our arthropod surveys at KHSRA suggest that cosmopolitan native and non-native species dominate the current fauna, with coastal sage scrub obligates apparently extirpated. We suspect that the arthropod diversity of the KHSRA was much higher prior to intense human development and introductions of exotic species. Historical assessments of the arthropod community present in the Baldwin Hills are essentially non-existent; therefore, we base this opinion on the arthropod fauna of other coastal sage scrub habitats as well as on anecdotal evidence.

INTRODUCTION

California Coastal Sage Scrub (hereafter CSS) is a drought-tolerant, fire-adapted plant community composed primarily of California Sagebrush (*Artemisia californica*), Buckwheat (*Eriogonum fasciculatum*), sages (*Salvia* spp.) and Coyote Brush (*Baccharis pilularis)*. In southern California, CSS historically covered the coastal regions from Ventura to San Diego Counties. Modern human activities have fragmented and reduced this system to what now amounts to roughly ten percent of its historic range in Southern California (Murphy et al. 1992; McCaull 1994). The greater Baldwin Hills, specifically the Kenneth Hahn State Recreation Area (hereafter KHSRA) in Los Angeles County, is currently composed of degraded CSS dominated by California Sagebrush and Coyote Brush. KHSRA represents the largest contiguous fragment of CSS remaining in the Baldwin Hills and served as the focal site for this arthropod survey.

In general, diversity of insect herbivore populations is believed to correlate positively with diversity and density of host plant species. The majority of herbivore species specialize on one or a few closely related species of plants

and therefore are limited by host species densities and distributions (Hogue 1993, Nylin and Janz 1999; but see Longcore 1999). The plant diversity of the coastal scrub of the Baldwin Hills appears to be relatively low because it lacks substantial populations of many indicator perennial species.

PREVIOUS COLLECTING IN THE BALDWIN HILLS

We have been unable to find species lists or voucher collections from past surveys of arthropod diversity in the Baldwin Hills. There is evidence scattered in the literature in the collections of the Entomology Section at the Natural History Museum of Los Angeles County (hereafter LACM) of collectors having visited the Baldwin Hills at least as early as the 1940s. For example, a Fiery Skipper butterfly (*Hylephila phyleus*) was collected by L. M. Martin in 1943 (Emmel and Emmel 1973). However, to our knowledge no comprehensive historical information exists for a direct comparison with the current study.

STUDY GOALS

In order to efficiently sample the arthropod fauna, we chose the following focal groups as indicators of habitat quality: Lepidoptera (moths and butterflies), Coleoptera (beetles), Hymenoptera (ants, bees and non-parasitic wasps) and Arachnida [Araneae (spiders), Scorpiones (scorpions) and related taxa]. Relative to most arthropods, these focal groups are more easily identified due to the existence of keys and collections as well as the presence of local individuals who specialize on some of these groups. Non-focal specimens collected are mentioned and included in the voucher collection but are not discussed at length.

METHODS

We chose a variety of collecting techniques to sample the arthropod fauna according to the habits of the focal groups. We placed pitfall traps at eight locations throughout KHSRA's coastal scrub and riparian areas to collect ground dwelling species of Hymenoptera, Coleoptera, and arachnids. We set Malaise traps in both the coastal scrub and riparian areas to collect flying Hymenoptera and Coleoptera. Yellow pan traps were set at three locations to collect flying Hymenoptera. We actively collected via beating sheets and aerial nets Lepidoptera, Coleoptera and Hymenoptera and ran black lights and a mercury vapor lamp to collect night-active Coleoptera and Lepidoptera. A complete list of sampling techniques, locations, dates, and time investments is given in Table 1. Sampling stations are depicted in Fig. 7. We spent approximately 112 hours sorting and curating samples.

Our sample reflects the arthropods active during June and July, 2000. Accurate surveying may have been complicated by dry conditions prior to the study period. Many arthropods retreat beneath the soil surface or otherwise restrict their activity during dry periods. Additionally, many CSS arthropods are documented to have seasonal variation in their activity patterns (Longcore 1999).

We consulted local entomologists and other arthropod experts to determine the amount and availability of historical information on arthropods of the Baldwin Hills and similar habitats in the Los Angeles basin. We also reviewed the collections of the LACM and searched for evidence of Baldwin Hills arthropods in collections located among the nature centers of the LA County natural parks system.

We will deposit determined specimens in the collection of the LACM. Undetermined specimens will remain in our collection until determination, at which time they will be deposited at LACM.

Table 1. Collecting Schedule in The Kenneth Hahn State Recreation Area, 2000. Refer to Fig. 7 for arthropod sampling locations.

Trap Type	Latitude	Longitude	Date Set	Date Collected	Habitat	Hours
Pitfall trap 1	34 0.682	118 22.298	2 June	8 June	Riparian	144
Pitfall trap 2	34 0.671	118 22.289	2 June	8 June	Riparian	144
Pitfall trap 3	34 0.653	118 22.279	2 June	8 June	Riparian	144
Pitfall trap 4	34 0.04	118 21.589	2 June	8 June	Coastal scrub	144
Pitfall trap 5	34 0.103	118 21.581	2 June	8 June	Coastal scrub	144
Pitfall trap 6	34 0.515	118 21.494	2 June	8 June	Coastal scrub	144
Pitfall trap 7	34 0.399	118 21.537	2 June	8 June	Coastal scrub	144
Pitfall trap 8	34 0.836	118 22.105	2 June	8 June	Coastal scrub	144
Malaise trap 1	34 0.681	118 22.293	2 June	8 June	Riparian	144
Malaise trap 2	34 0.103	118 21.581	8 June	8 July	Coastal scrub	720
Pan trap	34 0.681	118 22.293	2 June	3 June	Riparian	24
Pan trap	34 0.629	118 22.268	2 June	3 June	Coastal scrub	24
Pan trap	34 0.376	118 21.667	6 June	6 June	Coastal scrub	5
Black lighting	upper bathroom	lower parking		6 June	Coastal scrub	4.5
General collecting				6 June	Coastal scrub	6
General collecting				8 June	Coastal scrub	2
Total hours:						2081.5

HISTORICAL INFORMATION

We were unable to find any significant historical information on arthropod diversity in the Baldwin Hills. The most relevant comparative information is a specimen collection from the Ballona wetlands located at LACM. The Ballona wetlands have adjacent upland areas of coastal scrub with similar vegetation to the Baldwin Hills; however, the Ballona wetlands are on average wetter and cooler due to their proximity to the coast causing them to be botanically and therefore entomologically different from the Baldwin Hills. Thus, comparisons between the two sites should be made with caution. Unfortunately, many of the specimens in the Ballona collection are unidentified with the exception of moths (See Appendix 2).

Additionally, a five-year study surveying the arthropod fauna of the Palos Verdes Peninsula coastal sage scrub via pitfall traps (Longcore 1999) provides a more thorough and recent species list of ground dwelling arthropods. Palos Verdes CSS habitat, like the Ballona wetlands, is similar in proximity to the coast and therefore arthropod diversity is expected to differ from that of Baldwin Hills. We do however make generalizations between our study and Longcore's (1999) in order characterize the Baldwin Hills arthropod community.

Due to agricultural and urban development, and other impacts associated with modern human activity, CSS covers roughly ten percent of its historic range in Southern California (Murphy et al. 1992; McCaull 1994). In the Los Angeles basin what is left is fragmented and may represent less than five percent of the original cover (Mattoni 1990). The microclimate surrounding the CSS in the Baldwin Hills has been substantially modified due to year-round irrigation in adjacent landscaped areas, fire suppression and pollution. In addition, the purposeful and accidental introduction of exotic plants and arthropods has greatly influenced the floral and faunal components of the CSS community to the detriment of native species.

ANALYSIS OF THE CURRENT BIOTA

Species collected during our study are listed in the appendices. The identification of non-focal species, as well as those groups that do not contain any species of State or Federal concern, is still ongoing, and undetermined specimens are indicated as such in the appendices. An updated list will be available from the authors when more of the specimens receive determinations.

Our results for the arthropod diversity of the Baldwin Hills indicate that the fauna is dominated by exotic and native taxa with distributions ranging across nearly all habitat types (e.g., oak woodlands, chaparral, riparian, etc. in addition to coastal scrub). If our butterfly data (see Appendix 1) are indicative of other focal groups, they suggest that the arthropod fauna is dominated by species

common to much of southern California and often encountered in urban areas. We have not identified any coastal scrub endemic species from the Baldwin Hills. The paucity of coastal scrub endemic arthropods is not surprising given the degraded state of the scrub habitat and the abundance of exotic arthropods. Native species that have narrow habitat affiliations respond poorly to habitat disturbance and the introduction of exotics.

As mentioned in the introduction, arthropod diversity is generally dependent upon floral diversity. In the KHSRA many component species of the coastal sage scrub flora are absent or so poorly represented as to be ecologically insignificant. For example, buckwheat is an important nectar source and larval food source for many butterfly species, but occurs in only a few small, isolated patches at KHSRA which are likely insufficient to attract and support many individuals. Behr's Metalmark butterfly (*Apodemia virgulti*), a buckwheat specialist and CSS endemic, was not encountered at KHSRA during our study. The isolation of the KHSRA from other large CSS habitats in the region increases the probability that if Behr's Metalmark butterfly had occurred in the Baldwin Hills historically it may have already been extirpated. The probability of a butterfly's extirpation is very high in small patches of resource (Murphy and Weiss 1988).

Exotic arthropods such as the Argentine Ant (*Linepithema humile*), the Pill Bug (*Armadillidium vulgare*) and the European Earwig (*Forficula auricularia*) were the most abundant species in the pitfall trap samples. These exotics lack the predators, parasites and competitors that helped keep their population in check back in their native habitat. Argentine Ants are directly responsible for having an adverse impact on native ant faunas they come in contact with (Kennedy 1998, Erickson 1971, Human and Gordon 1996, Human et al. 1998), in addition to decreasing overall arthropod diversity (Cole et al. 1992, Holway 1995). It is limited to some extent by water availability, but is able to forage into dry areas adjacent to irrigated landscape (Human et al. 1998). Much of the KHSRA is bordered or pocketed with irrigation, allowing all, or nearly all, of the park to be infiltrated by these ants. The only other ant species we identified was the Thief Ant (*Solenopsis molesta*). It is a small species that has a habit of co-occurring with other ant species from which it takes food resources (Hogue 1993), perhaps explaining its ability to persist in the presence of the Argentine Ant.

The Pill Bug and European Earwig are also considered important threats to native species as they may prey upon the eggs and larvae of native species, as well as directly compete for space (see references in Longcore 1999). Native species dependent upon a narrow range of habitats (e.g., CSS endemic arthropods) are most vulnerable to non-native invasives because they are less able to survive in neighboring habitat and are unlikely to adapt to the rapid addition of exotic predators and competitors. Native generalists are more able to accommodate the addition of exotic taxa because they are better adapted to surviving in a variety of habitats.

Lepidopteran diversity is not likely to be limited by competing exotics so much as by native flora distributions and predaceous exotics. The only exotic butterfly identified in the study area was the European Cabbage White (*Pieris rapae*). Nineteen of the 33 lepidoptera species listed in Appendix 1 forage on a variety of common landscaping and/or weedy species. For example, the Monarch (*Danaus plexippus*) feeds exclusively on milkweed (*Asclepias* spp.) that grows readily in disturbed areas (e.g., agricultural areas, roadsides). The remaining 14 species feed upon a narrow range of hosts that are insufficiently represented in the coastal scrub of the Baldwin Hills.

The most important and substantial habitat in the Baldwin Hills for arthropods appears to be coastal scrub. A small drainage located below the fishing lake in KHSRA has some weak riparian qualities, but it is almost entirely dominated by the Argentine Ant and introduced Pill Bug. Based on comparisons made with the Palos Verdes arthropod study, the Baldwin Hills coastal scrub arthropod community should be defined as a "disturbed" community. This observation supports our aforementioned perception of the condition of the overall coastal scrub based on extensive habitat modification (i.e., increased irrigation, fire suppression, etc.) that has taken place.

Using arthropod diversity as a criterion, Longcore (1999) determined that "disturbed" CSS habitats are those that lack, or have a relatively low representation, of large, long-lived predators (e.g., scorpions, trapdoor spiders). We did not encounter scorpions in our sampling, but S. Thompson captured a large trapdoor spider (*Bothriocyrtum californicum*) in April, 2000. Trapdoor spiders can tolerate moderate levels of disturbance (B. Hebert, personal communication). The only large predator that we found in abundance, the sun spider (*Eremobates* sp.), is an exception indicative of disturbed rather than undisturbed habitat as it suggests the lack of scorpions in a habitat (Longcore 1999) because scorpions readily eat sun spiders.

ENDANGERED, THREATENED, SENSITIVE SPECIES

We did not encounter any State or Federally listed species in the Baldwin Hills, nor do we expect to encounter any because of the absence or limited representation of their foodplants. To our knowledge, there are only two Federally listed endangered species of butterfly that currently or historically inhabited CSS in the Los Angeles Basin, the Palos Verdes Blue (*Glaucopsyche lygdamus palosverdesensis* Perkins & Emmel), and the Quino Checkerspot (*Euphydryas editha quino* Behr).

The Palos Verdes Blue was first identified as a distinct species in 1977, and was believed extinct in 1983 after surveys in the habitat of the last known population yielded no adults or larvae (Arnold 1987). It was later rediscovered by a group led by Mattoni (1994) in previously unknown habitat inside naval property

on the Palos Verdes Peninsula. This species is not expected to occur in the Baldwin Hills because its sole foodplant, the Ocean Milk Vetch (*Astragalus trichopodus* var. *lonchus*), does not occur there.

The Quino Checkerspot once ranged throughout the CSS habitats of southern California. Now it is known from only a few populations in Riverside and San Diego Counties. This species is not likely to be rediscovered in the Baldwin Hills as its foodplants, Dwarf Plantain (*Plantago erecta*) and Paintbrush (*Castilleja exserta*), are not present. This butterfly, like other native species with restricted habitat requirements, is known to be sensitive to human-caused habitat disturbance.

Although only a few species of CSS arthropods are State or Federally listed, literature and personal communication suggest that a number of CSS species are declining in the greater Los Angeles basin as coastal sage scrub habitat is further fragmented and modified (Hogue 1993; R. Mattoni & J. Morton, personal communication). Thus, gauging the importance of habitat by the presence or absence of listed arthropods likely understates the threatened status of CSS habitat.

BIOLOGICAL CONNECTIVITY BETWEEN THE BALDWIN HILLS AND OTHER REGIONAL NATURAL HABITATS

The diversity of the arthropod community as it exists today in the Baldwin Hills appears to be dominated by widespread, habitat-generalist native and exotic species. Many of these species are excellent dispersers and do not require special habitat connections or corridors to move around (e.g., Monarch butterflies, Green Fig Beetles). Other species that do not disperse over long distances are able to spread quickly into adjacent areas because they tolerate habitats like street gutters and landscaped road dividers. For example, the exotic Pill Bug was introduced into California in 1926 (Paris 1963) and while it cannot fly, has spread to become one of the most abundant arthropods in nearly all habitats of Southern California.

CONSERVATION AND RESTORATION RECOMMENDATIONS

Our assessment of the arthropod diversity of the Baldwin Hills (specifically the KHSRA) has not encountered species identified as of current concern by the U. S. Fish and Wildlife Service or the California Department of Fish and Game. Research indicates that restoration efforts of coastal sage scrub are not able to duplicate arthropod diversity found in natural coastal sage scrub (Longcore 1999). Thus the first priority of restoration efforts should be to maintain all existing coastal scrub habitat in KHSRA and elsewhere in the Baldwin Hills. Restoring arthropod species expected in this habitat but not represented in our

findings would then require restoration of the flora of the Baldwin Hills. Such floral restoration would require designating larger, connected areas of the Baldwin Hills for native species and actively removing introduced species from the native areas in addition to restoring missing species.

In addition to floral restoration, the epidemic level of the non-native invasive Argentine Ant, European Earwig and Pill Bug must be addressed to reduce competition with native species and promote arthropod diversity. These exotic species are able to invade and thrive in native habitat due in part to the availability of water and distance from disturbed habitat. Irrigated fields and easements surround the coastal scrub habitat in the Baldwin Hills. Thus the Argentine Ant, the Pill Bug and the European Earwig will be a real and persistent threat to any future restoration of the Baldwin Hills unless the control of these invasive and detrimental species is addressed. A necessary first step in combating these three exotics is to reduce or eliminate the amount of irrigation within and adjacent to tracts of coastal scrub.

Our recommendations include the following:

1. **Continue to census the arthropod fauna.**

Our two-month study has only scratched the surface. There exists annual and intra-annual variation in arthropod activity. Sampling across at least 12 months is necessary to develop a more accurate picture of the Baldwin Hills arthropod diversity. Methods outlined in Longcore's (1999) study should serve as the model for future studies so that more accurate comparisons can be made.

2. **Preserve remaining coastal scrub habitat.**

The most important predictor of arthropod diversity in coastal scrub habitats appears to be the level of habitat disturbance. In the Palos Verdes CSS, habitats that had experienced the least amount of disturbance and modification contained the highest diversity of native taxa (Longcore 1999). Preservation of the remaining coastal scrub of the Baldwin Hills is necessary before restoration.

3. **Restore coastal scrub habitat**.

Restoring the expected arthropod diversity of KHSRA would require restoring and linking native flora as well as decreasing and strategically eliminating irrigation that allows non-native arthropods and plants to dominate the habitat.

The KHSRA uniquely offers native habitat, albeit degraded in its current state, that is accessibly located for urban residents. The area provides an excellent opportunity to expand environmental education activities, conduct research into habitat restoration, and to supplement the current recreational focus of the area. Even in its current condition, the presence of charismatic arthropods such as Fig Beetles, Anise Swallowtails and Milkweed Bugs provide opportunities for both passive and active environmental education. Restoration

efforts, if undertaken, should be combined with education outreach to sensitize KHSRA patrons to the efforts.

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World Wide Web resources:

California's endangered insects
(http://www.mip.berkeley.edu/essig/endins/endins.htm)

Moth images on the web
(http://www.furman.edu/~snyder/leplist/)

Moths of North America
(http://www.npwrc.usgs.gov/resource/distr/lepid/moths/mothsusa.htm)

Bibliography on coastal sage shrublands
(http://ceres.ca.gov/CRA/NCCP/oleary03.htm

APPENDIX 1. Butterfly (Lepidoptera) species observed in the Baldwin Hills (BH) and Ballona Wetlands (BW). Species observed or collected in the Baldwin Hills[1] and Ballona Wetlands[2] are marked with an "X" in the columns labeled "BH" and "BW," respectively. Species not observed in the Baldwin Hills during the present study but likely to occur there are listed. List sequence follows that of Mattoni (1990).

Scientific Name	**Common Name**	BH	BW	**Probable Or Confirmed Host Plants In BH**
PAPILIONIDAE				
Papilio zelicaon *Lucas*	Anise Swallowtail	X	X	Sweet Fennel (*Foeniculum vulgare*)
Papilio rutulus Lucas	Western Tiger Swallowtail	X		willow (*Salix*), sycamore (*Platanus*), alder (*Alnus*)
PIERIDAE				
Pieris rapae L.	Cabbage White	X	X	mustard family (Cucurbitaceae)
Pieris protodice Bois. & LeC.	Common White		X	mustard family (Cucurbitaceae)
Anthocharis sara sara	Sara Orangetip			mustard family (Cucurbitaceae)
Colias eurytheme Bois.	Alfalfa butterfly		X	legumes (Fabaceae)
Phoebis sennae marcellina Cramer	Senna Sulfur		X	*Cassia* and various introduced species
Nathalias iole	Dwarf Yellow			asters (Asteraceae)
NYMPHALIDAE				
Danaus plexippus L.	Monarch	X	X	milkweed (*Asclepias*)
Danaus gilippus strigosus (Bates)	Striated Queen		X	Exotic milkweeds (*Asclepias*)
Vanessa cardui (L.)	Painted Lady	X	X	thistles (Asteraceae), nettles (Urticaceae)
Vanessa carye anabella (Field)	West Coast Lady	X	X	Mallows and *Hibiscus* (Malvaceae)
Vanessa virginiensis (Drury)	Virginia Lady		X	*Gnaphalium* spp.
Nymphalis antiopa L.	Mourning Cloak	X	X	elm (*Ulmus*), willow (*Salix*), poplar (*Populus*)
Precis coenia Hubner	Buckeye	X	X	*Plantago* spp.

APPENDIX 1. (cont.)

Scientific Name	Common Name	BH	BW	Probable Or Confirmed Host Plants In BH
LYCAENIDAE				
Apodemia mormo virgulti (Behr)	Behr's Metalmark		X	buckwheats
Calephelis nemesis	Dusky Metalmark			
Strymon melinus pudica (Hy. Edwards)	Common Hairstreak	X	X	Various species
Callophrys augustus iroides	Western Elfin			Various species
Callophrys affinis perplexa	California Green Hairstreak			Deerweed (*Lotus scoparius*), buckwheat (*Eriogonum*)
Callophrys dumetorum dumetorum (Bois.)	Coastal Green Hairstreak		X	Deerweed and other *Lotus* spp.
Brephidium exilis Bois.	Pygmy Blue		X	Saltbush (*Atriplex* spp.) and related spp.
Leptotes marina Reakirt	Marina Blue	X	X	*Plumbago*, various legumes (Fabaceae)
Hemiargus ceraunus gyas	Edward's Blue			legumes (Fabaceae)
Hemiargus isola alce	Mexican Blue			legumes (Fabaceae)
Plebejus acmon acmon (West & Hewit)	Acmon Blue		X	Deerweed, other *Lotus* spp.
Euphilotes battoides (Behr)	Western Square-dotted Blue			buckwheats
Glaucopsyche lygdamus australis Grinnel	Southern Blue		X	Deerweed

APPENDIX 1. (cont.)

Scientific Name	Common Name	BH	BW	Probable Or Confirmed Host Plants In BH
HESPERIIDAE				
Hylephila phyleus (Drury)	Fiery Skipper	X	X	Bermuda Grass (Cynodon dactylon), other grasses
Polites sabuleti sabuleti Bois.	Sandhill Skipper		X	grasses
Paratrytone melane	Umber Skipper			Grasses and sedges
Lerodea eufala	Eufala Skipper			grasses
Erynnis zarucco funeralis (Scudder & Burgess)	Funeral Duskywing Skipper	X	X	Deerweed

[1]data based on observations and collections of current study in the Baldwin Hills
[2]data based on Ballona wetlands collection at the Natural History Museum of Los Angeles County's Entomology Section.

APPENDIX 2. Moth (Lepidoptera) species observed in the Baldwin Hills (BH) and Ballona (BW) Wetlands. Species observed or collected in the Baldwin Hills[1] and Ballona Wetlands[2] are marked with an "X" in the columns labeled "BH" and "BW," respectively.

Scientific name	Common name	BH	BW
COSMOPTERIGIDAE			
Walshia miscecolorella Chambers	Sweetclover Root Borer		X
GELECHIIDAE			
Anacampsis lacteusochrella Chambers	none	X	
GEOMETRIDAE			
Disclisioprocta stellata stellata (Guenée)	none	X	
Euphyia implicata multilineata (Packard)	none		X
Merochlora faseolaria Guenée	none		X
Perizoma custodiata Guenee	none		X
Plataea californiaria Herrich-Schäffer	none	X	
NOCTUIDAE			
Acontia coquillettii Smith	none		X
Agrotis ipsilon (Hufnagel)	Black Cutworm	X	
Autographa biloba (Stephens)	Bilobed Looper	X	
Autographa californica Speyer	Alfalfa Looper		X
Caenurgia togataria Walker	none		X
Copibryophila angelica Smith	none		X
Discestra chartaria Grote	none		X
Heliothis phloxiphaga Grote & Robinson	False Corn Earworm	X	X
Hemeroplanis finitima Smith	none	X	X
Hemeroplanis sp.	none		X
Hemieuxoa rudens Harvey	none		X
Lacinipolia stricta cinnabarina Grote	none		X
Protorthodes rufula Grote	none		X
Pseudaletia unipuncta (Haworth)	Armyworm	X	
Schinia scarletina Smith	none		X
Spodoptera exigua Hubner	Beet Armyworm		X
Trichoplusia ni (Huebner)	Cabbage Looper	X	
OECOPHORIDAE			
Agonopterix alstroemeriana Clerck	none	X	
Depressariodes gracilis Walsingham	none		X
PLUTELLIDAE			
Plutella xylostella (L.)	Diamondback Moth	X	

APPENDIX 2. (cont.)

Scientific name	Common name	BH	BW
PYRALIDAE			
Euchromius ocellea Hawarth	none		X
Hellula rogatalis Hulst	Cabbage Webworm		X
Lipographus fenestrella Packard	none		X
Loxostege immerens Harvey	none		X
Uresiphita reversalis Guenée	none		X
SESIIDAE			
Paranthrene robiniae Edwards	Western Poplar Clearwing		X
Synanthedon bibionipennis Boisduval	Strawberry Crown Moth		X
SPHINGIDAE			
Hyles lineata F.	White-lined Sphinx		X
TORTRICIDAE			
Clepsis peritana Clemens	Garden Tortrix		X
Platynota stultana Walsingham	Omnivorous Leafroller	X	
UNDETERMINED			
32 undetermined species			

[1]data based on observations and collections of current study in the Baldwin Hills
[2]data based on Ballona wetlands collection at the Natural History Museum of Los Angeles County's Entomology Dept.

APPENDIX 3. Beetle (Coleoptera) species observed in the Baldwin Hills, 2000.

Scientific Name	Common Name
BOSTRICHIDAE (Branch borers)	
1 undet. species	none
CANTHARIDAE (Soldier beetles)	
Cantharis consors LeConte	Brown Leatherwing
CARABIDAE (Ground beetles)	
7 undet. species	none
CERAMBYCIDAE (Long-horned wood boring beetles)	
Ipochus fasciatus LeConte	none
Nathrius brevipennis *(Mulsant)*	none
CHRYSOMELIDAE (Leaf beetles)	
Chrysochus auratus cobaltinus LeConte	Milkweed Beetle
2 undet. species	none
CLERIDAE (Checkered beetles)	
1 undet. species	none
COCCINELLIDAE (Ladybird beetles)	
Hippodamia convergens Guerin-Meneville	Convergent Ladybug
6 undet. species	none
CURCULIONIDAE (Weevils)	
4 undet. species	none
DERMESTIDAE (Carpet beetles)	
Anthrenus sp. 1	none
Anthrenus sp. 2	none
Anthrenus sp. 3	none
ELATERIDAE (Click beetles)	
5 undet. species	none
HISTERIDAE (Clown beetles)	
1 undet. species	none
MORDELLIDAE (Tumbling flower beetles)	
6 undet. species	none

APPENDIX 3 (cont.)

Scientific Name	Common Name
SCARABAEIDAE (Scarab beetles)	
Cotinus texana (Gory and Percheron)	Green Fig Beetle
Polyphylla crinita LeConte	June Bug
Serica sp.	none
STAPHYLINIDAE (Rove beetles)	
Staphylinus olens Muller	Devil's Coach Horse
5 undet. Species	none
TENEBRIONIDAE (Darkling beetles)	
Cratidus osculans LeConte	Wooly Darkling
Eleodes sp.	Stink Beetle
Phloeodes pustulosus LeConte	Ironclad Beetle
2 undet. Species	none
UNDETERMINED	
5 additional undet. families/species	

APPENDIX 4. Ant, bee and wasp (Hymenoptera) species observed in the Baldwin Hills, 2000.

Scientific Name	**Common Name**
FORMICIDAE (Ants)	
Linepithema humile (Mayr)	Argentine Ant
Solenopsis molesta (Say)	Thief Ant
APIDAE (Honeybees, bumblebees and stingless bees)	
Apis mellifera (L.)	European Honeybee
***Bombus californicus* Smith**	California Black-faced Bumblebee
B. vosnesenskii Radoszkowski	Yellow-faced Bumblebee
SPHECIDAE (Digger wasps)	
Isodontia sp.	none
Sphex sp. (nr. *Ichneumonea*)	none
UNDETERMINED	
10 additional undet. species of non-ant Hymenoptera	

APPENDIX 5. Arachnids (spiders and related groups) observed in the Baldwin Hills, 2000.

Scientific name	Common name
AGELENIDAE (Funnel weavers or grass spiders)	
Rualena sp.?	none
ANYPHAENIDAE (Sac spiders)	
Anyphaena pacificus?	none
CLUBIONIDAE (Tube spiders)	
Undet. sp.1	none
CTENIZIDAE (Mygalomorph spiders)	
Bothriocyrtum californicum (O.P.-Cambridge)	Trapdoor Spider
DYSDERIDAE (Cell spiders)	
Dysdera crocata Koch	Sowbug Killer
GNAPHOSIDAE (Sac spiders)	
Poecilochroa sp.	none
Herpyllus sp.	none
Undet. sp.1	none
Undet. sp.2	none
LINYPHIIDAE (Sheetweb weavers)	
Undet. sp. 1	none
LIOCRANIDAE	
Titiotus sp.?	none
LYCOSIDAE (Wolf spiders)	
Pardosa sp.	none
OECOBIIDAE (Lace web spiders)	
Oecobius sp.	none
OXYOPIDAE (Lynx spiders)	
Oxyopes sp.	none
PHILODROMIDAE (Crab spiders)	
Tibellus oblongus (Walckanaer)	none
PHOLCIDAE (Cellar spiders)	
Physocyclus sp.	none

APPENDIX 5 (cont.)

Scientific name	Common name
SALTICIDAE (Jumping spiders)	
Salticus sp	none
Undet. sp.1	none
Undet. sp.2	none
OPILIONIDA (Harvestman)	
Undet. sp.1	none
SOLPUGIDA: Eremobatidae (sun spiders)	
Eremobates sp.	Sun Spider
UNDETERMINED	
many undet. species	

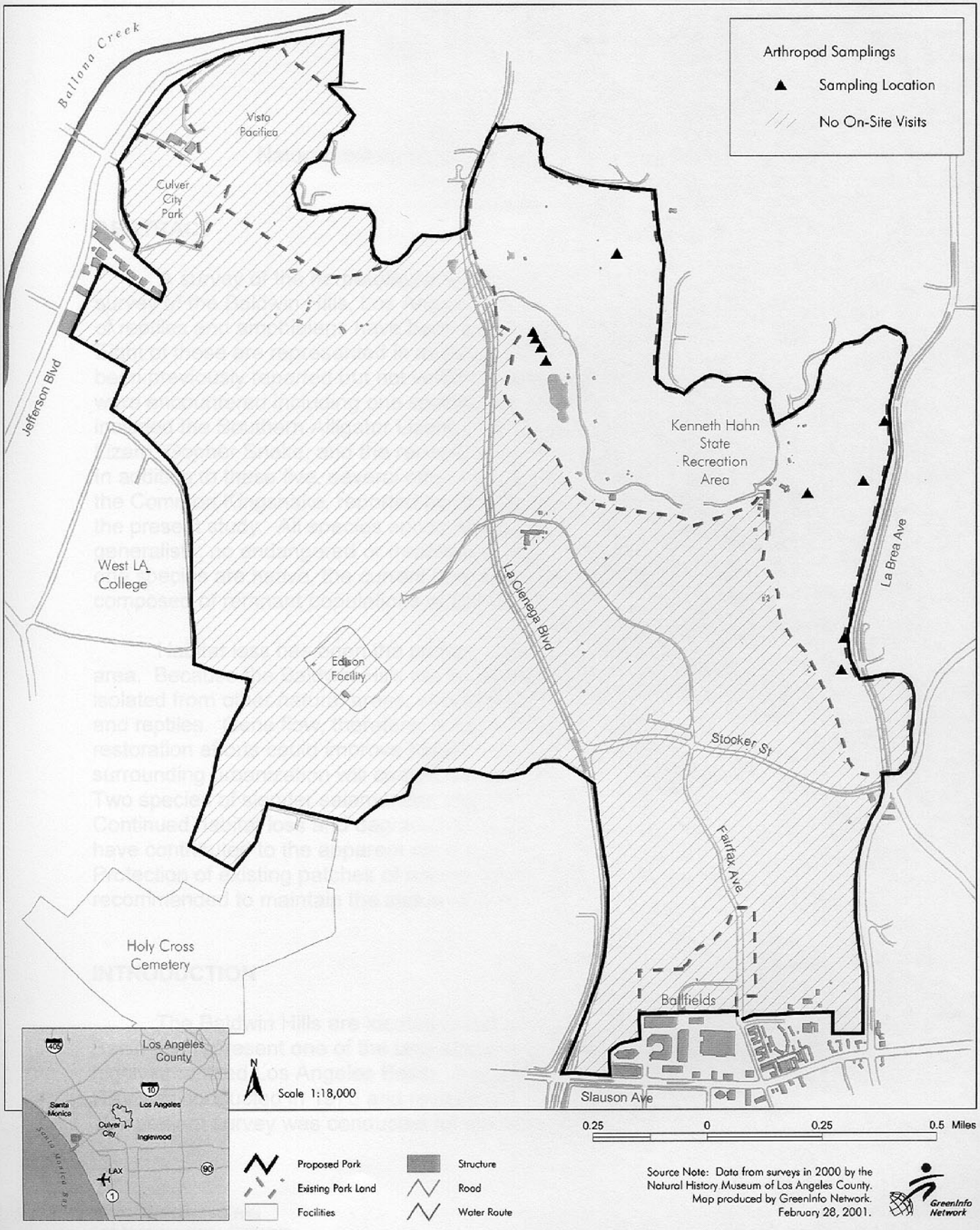
APPENDIX 6. Large non-focal arthropods encountered in the Baldwin Hills, 2000.

Scientific name	Common name
DIPTERA: Bombyliidae (Bee flies)	
Ligyra gazophylax (Loew)	none
Undet. sp.1	none
HETEROPTERA: Lygaeidae:	
Oncopeltus fasciatus (Dallas)	Large Milkweed Bug
ODONATA: Libellulidae (Dragonflies or skimmers)	
Sympetrum illotum (Hagen)	Cardinal Meadowhawk
ORTHOPTERA: Gryllidae (Crickets)	
Oecanthus argentinus Saussure	Common Tree Cricket
Acrididae (Grasshoppers)	
Schistocera nitens Thunberg	Bird-wing Grasshopper
Trimerotropis pallidipennis (Burmeister)	Pallid Band-wing Grasshopper
ISOPODA: Oniscidae (Sow bugs)	
Armadillidium vulgare (Latreille)	Pill Bug, Door Yard Sow Bug
Porcelio laevis (Koch)	Woodlouse

Community Conservancy International

NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

Arthropod Sampling Locations



Source Note: Data from surveys in 2000 by the Natural History Museum of Los Angeles County. Map produced by GreenInfo Network. February 28, 2001.

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