

## ARBORETUM SPECIES LIST: INVERTEBRATES, FISHES, AMPHIBIANS, REPTILES, AND MAMMALS

Species in boldface have been confirmed present in the Arboretum; other species expected based on range and habitat requirements.

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<b>CRAYFISH: Class Crustacea (from PB Moyle personal communication)</b>			
<b><i>Procambarus clarki</i></b> red crayfish	Extremely abundant	Invasive	<b>Non-native. Native to South-Central U.S. and Northeastern Mexico. Burrows may damage banks and activity increases turbidity. Carnivorous. Common prey item of herons and Egrets. (Rogers 2000, Godfrey 2004).</b>
<b>BUTTERFLIES: Order Lepidoptera (from Brock and Kaufman 2003, AM Shapiro personal communication)</b>			
<b><i>Battus philenor</i></b> pipevine swallowtail		Riparian Indicator Species	<b>Native. Frequents a variety of open habitats, open woodlands, and edges. Declining regionally. Flies Feb-Nov. 100% dependent on <i>Aristolochia californica</i>.</b>
<i>Papilio zelicaon</i> anise swallowtail	Unconfirmed, but possibly present.		Native. Late February-October. Habitat: bare hills, mountains, gardens, fields, vacant lots, and roadsides. Host plants: carrot family (Apiaceae), including sweet fennel, <i>Foeniculum vulgare</i> ("anise") and poison hemlock
<b><i>Papilio rutulus</i></b> western tiger swallowtail	Common		<b>Native. Habitat: riparian community; woodlands near rivers and streams, wooded suburbs, canyons, parks, roadsides, and oases. Flight period early spring to midsummer, in some places to late fall. Food plants: leaves of <i>Populus fremontii</i>, <i>Salix</i>, <i>Platanus</i>, <i>Prunus</i> (wild cherry), and <i>Fraxinus</i>. Nectar plants: Nectar from many flowers including thistles, abelia, California buckeye, zinnia, and yerba santa.</b>
<i>Pontia protodice</i> checkered white	Unconfirmed, but possibly present.		Native. Current decreasing trend. Habitat: open grassland; occurrence irregular, sometimes very abundant. Always subject to extreme population fluxes, but a current declining trend is noteworthy in both the eastern and western United States. Food plants: many members of Brassicaceae.
<i>Euchloe ausonides</i> large marble	Unconfirmed, but possibly present.		Native. Formerly common in the Central Valley, almost extinct regionally. Habitat: meadows, fields, farmlands, vacant lots, and along streamsides. Flight period Mar-Jun. Food plants: Brassicaceae: <i>Brassica</i> , <i>Raphanus</i> .
<b><i>Pieris rapae</i></b> cabbage white	<b>Ubiquitous and abundant</b>		<b>Non-native. January-December. Host plants: various members of the mustard family, Brassicaceae.</b>
<b><i>Colias eurytheme</i></b> orange sulphur	<b>Common to abundant</b>		<b>Native. Host plants: legume family, Fabaceae (various species of vetch, <i>Vicia</i>, spp.)</b>
<i>Danaus plexippus</i> monarch	Unconfirmed, but possibly present.		Native. March-December. Habitat includes fields, meadows, weedy areas, marshes, and roadsides. Host plants: narrow-leaf and broad-leaf milkweeds
<i>Limenitis lorquini</i> Lorquin's admiral	Unconfirmed, but possibly present.	Sensitive	Native. Habitat: along valley streams from late spring to fall; has declined catastrophically. Has been reported at North Davis Pond. Food plants: <i>Salix</i> .
<i>Nymphalis antiopa</i> mourning cloak	Unconfirmed, but possibly present in the Arboretum	Sensitive	Native. Regional collapse began 3 years ago, quite common previously. Over winters in Central Valley, adults emerge in Jan, 1st generation generally produced in mid May; migrate to Sierra Nevada to produce 2nd generation which migrates back to Valley in fall (primary flight season). Seen on willow catkins in early spring. Food plants: <i>Salix</i> , <i>Ulmus</i> , <i>Celtis</i> .

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Junonia coenia</i> buckeye	Common to abundant		Native. January-December. Habitat: open, sunny areas with low vegetation and some bare ground. Hosts: a variety of plants in the families Scrophulariaceae and Plantaginaceae, including English and broad-leaved plantains and the ground cover, common fog fruit, (Verbenaceae), <i>Phyla</i>
<i>Vanessa cardui</i> painted lady	Often very abundant		Native. February-November, but often scarce or absent in July and August. Host plants: many weeds, especially members of the mallow family, Malvaceae, and various thistles, <i>Cirsium</i> sp. This is a migratory species. It enters our area late each winter from its overwintering grounds in the deserts of San Diego and Imperial Counties and Northern Mexico.
<i>Vanessa annabella</i> west coast lady	Unconfirmed, but possibly present.		Native. All year. Hosts: various weedy mallows, Malvaceae and, more rarely, stinging nettle, <i>Urtica holosericea</i>
<i>Vanessa atalanta</i> red admiral	Unconfirmed, but possibly present.		Native. All year. Habitat: moist woods, yards, parks, marshes, seeps, and moist fields. During migrations, the Red Admiral is found in almost any habitat from tundra to subtropics. Host: stinging nettle, <i>Urtica holosericea</i>
<i>Vanessa virginiensis</i> American lady	Unconfirmed, but possibly present.		Native. All year, most common in Spring and Fall. Hosts: everlastings (Asteraceae), <i>Gnaphalium</i> spp. and <i>Antennaria</i> spp.
<i>Polygonia satyrus neomarsyas</i> satyr comma or satyr anglewing	Unconfirmed, but possibly present.	Riparian Indicator Species	Native. Habitat: riparian vegetation and understory. Stable from Winters west, sporadic east of Winters. Adults long lived, often fly on warm late-winter days. Flight period Feb-Nov; two to three broods. Food plant: <i>Urtica</i> sp. ("stinging nettle").
<i>Nymphalis californica</i> California tortoise-shell	Unconfirmed, but possibly present.		Native. Except for the occasional midwinter hibernator, it is seen here only when migrating. March-June and again in late September-October. Habitat: chaparral, woodland, brush areas, forest clearings, edges. Host: California lilac, <i>Ceanothus</i> spp.
<i>Nymphalis milberti</i> Milbert's tortoise-shell	Unconfirmed, but possibly present.		Native. Occasionally seen in winter, otherwise March-June and, rarely, in autumn. Habitat: wet areas near woodlands, moist pastures, and marshes. Host: stinging nettle, <i>Urtica holosericea</i>
<i>Phyciodes mylitta</i> mylitta crescent	Unconfirmed, but possibly present.		Native. March-November. Host plants: native thistles, <i>Cirsium</i> spp., milk thistle <i>Silybum marianum</i> , and European thistles, <i>Carduus</i> spp.
<i>Phyciodes campestris</i> field crescent	Unconfirmed, but possibly present.		Native. March-October. Habitat: flats and open areas, fields, meadows, and streamsides from plains to mountains. Host: <i>Aster</i> spp.
<i>Satyrium sylvinum sylvinum</i> sylvan hairstreak	Unconfirmed, but possibly present.	Riparian Indicator Species	Native. Habitat: streamsides, willow thickets; in Valley and mountains. Local population at Old Davis Rd bridge extirpated by DWR vegetation clearing. Flight May-June. Food plants: various species of <i>Salix</i> , locally dependent on <i>Salix exigua</i>
<i>Lycaena xanthoides</i> great copper	Unconfirmed, but possibly present.	Riparian Indicator Species	Native. Resident along South Fork Preserve and in UCD Riparian Reserve. Intensely local. Habitat: grassland and open riparian woodland. Populations holding regionally. Flight period May-early July. Food plants: <i>Rumex</i> spp., including <i>R. pulcher</i> , <i>R. crispus</i> , <i>R. hymenosepalus</i> . Nectar plants: <i>Grindelia</i> , <i>Apocynum</i> , <i>Heliotropium</i> .
<i>Glaucopsyche lygdamus</i> silvery blue	Unconfirmed, but possibly present.	Riparian Indicator Species.	Native. Formerly widely distributed, went locally extinct in early 1970's, was reintroduced a decade later. In danger of extinction from fire, disking, herbicides, etc. Univoltine: flight period Mar-early May. Food plants: <i>Lupinus</i> spp., <i>Lathyrus</i> spp., <i>Vicia</i> spp. and other Fabaceae at Putah Creek, and <i>Vicia</i> on the valley floor.

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Atides halesus</i> great purple hairstreak	Unconfirmed, but possibly present.		Native. Flight period Mar-Oct. Habitat: canopy species (difficult to monitor). Feeds on common mistletoe ( <i>Phoradendron flavescens</i> ) in oaks and cottonwood. Flies in oak woodland and along stream bottoms where cottonwoods, sycamores, and ash trees grow; at times pupae may be gathered in numbers from litter beneath such trees on which mistletoe grows.
<i>Strymon melinus</i> common or gray hairstreak	Common		<b>Native. February-November. Hosts: various weeds including mallow, (Malvaceae), Vetch, <i>Vicia</i> spp., and turkey mullein, <i>Eremocarpus setigerus</i>.</b>
<i>Satyrium californica</i> California hairstreak	Unconfirmed, but possibly present.		Native. Habitat: foothill chaparral or lower mountain habitats. Often seen in large numbers at buckwheat, dogbane, and other flowers, and adults also perch on larval foodplants. Flies in late spring or summer. Host: valley oak, <i>Quercus</i> spp.
<i>Satyrium auretteum</i> gold-hunter's hairstreak	Unconfirmed, but possibly present.		Native. May-July. Hosts: Oaks, <i>Quercus</i> spp.
<i>Lycaena xanthoides</i> great copper	Unconfirmed, but possibly present.		Native. Habitat: chaparral and scrub habitats. May-July. Hosts: dock <i>Rumex</i> spp.
<i>Lycaena helloides</i> purplish copper	Unconfirmed, but possibly present.		Native. Habitat: open, moist (often disturbed) habitats. Once common in fields, yards, vacant lots, and marshy areas. Food plants: many members of the Buckwheat family (Polygonaceae), including dock, sorrel ( <i>Rumex</i> spp.), and knotweeds ( <i>Polygonum</i> spp.). In dry yards and vacant lots: Wire Grass, Yard Knotweed ( <i>P. aviculare</i> ). In marshy areas: Common Knotweed ( <i>P. lapathifolium</i> ) and many others.
<i>Everes comyntas</i> eastern tailed blue	Unconfirmed, but possibly present.		Native. February-November. Hosts: herbaceous legumes, especially Spanish lotus, <i>Lotus purshianus</i>
<i>Plebeius acmon</i> acmon blue	Common to abundant		<b>Native. Flight period Feb-Oct. Host plants: many Fabaceae: <i>Lotus</i> spp. Including <i>L. scoparius</i>, <i>L. purshianus</i>. Also <i>Polygonum aviculare</i> and <i>Eriogonum</i> spp.</b>
<i>Brephidium exilis</i> western pygmy blue	Unconfirmed, but possibly present.		Native. April-December, Rare early in Season; often very abundant in fall. Smallest butterfly in North America. Hosts: members of the goosefoot family, Chenopodiaceae, including Russian thistle (tumbleweed), <i>Salsola tragus</i>
<i>Leptotes marina</i> marine blue	Unconfirmed, but possibly present.		Native. March-December, Irregular. Host (locally): wild licorice, <i>Glycyrrhiza lepidota</i>
<i>Celastrina argiolus echo</i> echo blue	Unconfirmed, but possibly present.		Native. February-June, two broods. Hosts: various shrubs and trees, including California lilac, <i>Ceanothus</i> spp., and California buckeye, <i>Aesculus californica</i>
<i>Pholisora catullus</i> sooty wing	Unconfirmed, but possibly present.		Native. March-November. Host plants: pigweed family, Amaranthaceae.
<i>Erynnis tristis</i> sad dusky-wing	Unconfirmed, but possibly present.		Native. March-October. Hosts: <i>Quercus</i> spp.
<i>Pyrgus communis</i> common checkered skipper			<b>Native. Habitat: backyards, vacant lots, city parks, fields, cultivated lands, and along roadsides. US &amp; Canada south to Argentina. Food plants: many members of the Malvaceae, including <i>Malvella leprosa</i> and the weedy Malva.</b>
<i>Pyrgus scriptura</i> little checkered skipper	Unconfirmed, but possibly present.		Native. Habitat: alkali flats, alkaline fields, usually at low elevations. In Northern California, most common in the Sacramento Delta and interior valleys. Flight period Mar-Oct. Sole food plant: <i>Malvella leprosa</i> .

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Paratrytone (Poanes) melane</i> umber skipper	Unconfirmed, but possibly present.	Riparian Indicator Species.	Native. Habitat: Riparian woodland in Valley, streamsides, clearings, trails, roadsides, at low elevations. Currently extinct below Lake Solano. Numbers declining in Sacramento and possibly Vacaville foothills. Flight period Mar-Jun and Jul-Oct. Food plants: various grasses.
<i>Polites sabuleti</i> sandhill skipper	Common		<b>Native. March-November. Hosts: grasses, especially Bermuda Grass, <i>Cynodon dactylon</i></b>
<i>Ochlodes sylvanoides</i> woodland skipper	Unconfirmed, but possibly present.	Riparian Indicator Species	Native. Habitat requirements poorly understood, but associated w/ <i>Quercus lobata</i> . Flight period Jul-Oct. Food plants: various grasses, especially <i>Elymus</i> spp. The only butterfly species that nectars on the unusually shaped flower of <i>Trichostemma lanceolatum</i> .
<i>Hylephila phyleus</i> fiery skipper	Common		<b>Native. Habitat: abundant on mowed lawns. Rare in Spring, increasingly abundant from June through autumn (a few to December). Hosts: grasses, Poaceae, especially Bermuda grass, <i>Cynodon dactylon</i>.</b>
<i>Atalopedes campestris</i> field skipper	Unconfirmed, but possibly present.		Native. March-November, three broods. Hosts: grasses, Poaceae, especially Bermuda grass, <i>Cynodon dactylon</i>
<i>Lerodea eufala</i> eufala skipper	Unconfirmed, but possibly present.		Native. Rare in Spring, common late July-early November Hosts: grasses, Poaceae, especially Johnson grass, <i>Sorghum halepense</i> and dallis grass, <i>Paspalum</i> spp.
<i>Hemileuca eglanterina/ Pseudohazis eglanterina</i> sheep moth			Native. Diurnal. Valley floor willow feeder. Extinct on campus. Formerly abundant near Old Davis Road bridge. Extant in Suisun and Delta and Bobelaine Sanctuary. Seen occasionally near Lake Solano. Overwinter as eggs on willow, adult emergence Sept-Oct.
<b>FISHES: Class Osteichthyes (from Moyle 2002)</b>			
<i>Lavinia exilicauda</i> hitch	Not present in waterway	watch list	Native. Widespread in warm, low-elevation, slow-moving lakes and rivers and clear streams. May be found in low numbers in urban areas with turbid water. Very high temperature tolerance. Could be encouraged with improvements in water quality and submerged vegetation.
<i>Orthodon microlepidotus</i> Sacramento blackfish	Stable population	Stable or increasing	<b>Native. Abundant in warm, usually turbid waters of the Central Valley floor, often in highly modified habitats. Well adapted for survival in extreme environments. Hemoglobin has a high affinity for oxygen enabling this fish to survive in hypoxic environments.</b>
<i>Pimephales promelas</i> fathead minnow	Most numerous fish in the Waterway	Aggressive invader	<b>Non-native. Habitat: pools in small, muddy streams and ponds. Tolerant of extreme alkalinity, low dissolved oxygen, high levels of organic pollution and turbidity and high temperatures. High reproductive rates. Opportunistic bottom browsers on algae, diatoms, invertebrates and organic matter.</b>
<i>Cyprinus carpio</i> common carp	Accounts for the majority of the fish biomass in the waterway	Widespread and stable	<b>Non-native. Most abundant in warm, turbid, eutrophic water at low elevations. They can survive in high turbidity, sudden temperature changes, high temperatures, and low oxygen concentrations. They can survive in deoxygenated water by gulping air at the surface. Omnivorous bottom feeders. They often uproot plants and disturb silty bottoms while feeding, removing food and cover from other fishes and increasing turbidity. Koi, the popular ornamental pond fish, are carp, and if they escape or are released, they can establish wild populations.</b>

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Gambusia affinis</i> western mosquitofish	Abundant	Aggressive Invader	<b>Non-native. Habitat: shallow, often stagnant, ponds and shallow edges of lakes and streams. Well adapted to high temperatures, extreme daily temperature fluctuations, and low dissolved oxygen concentration. Omnivorous, opportunistic top and bottom feeders. They can feed extensively on mosquito larvae and pupae, but they also feed on almost any small food or prey items available.</b>
<i>Archoplites interruptus</i> Sacramento perch	Not present in waterway	SSSC	Native. Adapted to withstand turbidity, high temperatures, high salinities and high alkalinities. Often excluded by nonnative sunfishes (Centrarchidae). Predatory, opportunistic, large individuals are piscivorous. Could be encouraged with Removal of non-native fish in the waterway. Establishment of aquatic plant beds.
<i>Lepomis cyanellus</i> green sunfish	Common	Widespread and stable	<b>Non-native. Habitats include small warm streams, ponds and lake edges. Able to survive, high temperatures, low dissolved oxygen concentration, and very alkaline waters. Aggressive, territorial. Opportunistic predator and competitor with native fish.</b>
<b>AMPHIBIANS: Class Amphibia</b>			
<i>Batrachoseps attenuatus</i> California slender salamander	Not present in the Arboretum, but have been found on Putah Creek		Native. Requires moist habitat. Found in several locations around Davis and Sacramento (DB Wake personal communication). Found above ground under leaf litter, downed logs etc. from first fall rain until the start of the dry season. Lives underground during dry times of the year. Apparently not excluded by human disturbance. (AmphibiaWeb 2005). Could be introduced to Redwood Grove if boards or logs were placed on the ground.
<i>Pseudacris regilla</i> Pacific treefrog	not present		Native. Seeks cover in many places, including rock fissures, under bark, in vegetation along streams, in rodent and other burrows, in nooks and crannies in buildings, and in culverts. Can be found in springs, ponds, irrigation canals, streams, and other bodies of water, but it has also been found as far as ½ mile from water (Stebbins 1951). Out of the water, it frequents habitats like grassland, chaparral, woodland, desert oases, forest, and farmland (Stebbins 1985). Could be encouraged with addition of aquatic plants and small side pools for young
<i>Rana catesbeiana</i> bullfrog	Present, but no established breeding population		<b>Non-native. Voracious eater, threatens <i>Pseudacris</i> population. By eating larvae and tadpoles. (Stebbins 2003)</b>
<b>REPTILES: Class Reptilia (turtle species composition and abundance from Spinks et. al/ 2003)</b>			
<i>Chrysemys picta</i> painted turtle	2 individuals found and removed in 1998 and 2000 respectively		<b>Non-native. Found in quiet, sluggish bodies of water with soft bottoms (Stebbins 2003). These turtles are omnivorous and will sometimes scavenge (Kipper 2002).</b>
<i>Emys marmorata</i> western pond turtle	Population dominated by adults and declining in the Arboretum. Population of approx. 75 individuals.	SSSC	<b>The only native California turtle. Aquatic, requires aquatic vegetation to for juveniles to grow. Requires basking areas. Studied extensively in the Arboretum waterway from 1994-2001. Enhancement opportunities: create basking and nesting habitat. Head start juvenile turtles to augment population. Control non-native turtles. (Spinks et al/ 2003)</b>

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Graptemys pseudogeographica</i> false map turtle	4 individuals found and removed in 1994		Non-native. Found in southern Canada and much of the Eastern U. S. Omnivorous, aquatic. Reproduction in Arboretum found to be limited (Spinks <i>et al</i> 2003).
<i>Pseudemys concinna</i> river cooter	1 female individual found and removed in 1998		Non-native. Found in Eastern and Southeastern U. S. Primarily a river turtle, but found in other quieter habitats. Primarily herbivorous, but can be omnivorous (Gardiner 2000).
<i>Trachemys scripta elegans</i> pond slider, red-eared slider	124 individuals captured and removed from 1994 to 2001	Invasive	Non-native. Native to the Mississippi River Valley (Kuhrt and Dewey 2002). Sold frequently as pets, leading to widespread introduction. Thoroughly aquatic, often seen basking alone or in groups. Prefers quiet water with aquatic vegetation (Stebbins 2003). Reproductively successful in the Arboretum (Spinks <i>et al</i> 2003).
<i>Glyptemys muhlenbergii</i> bog turtle	1 individual died shortly after capture in 1998	Federal Threatened, but not native to CA	Non-native. Native to swamps and bogs in the Eastern U. S. Prefers highly specific habitat that is disappearing due to natural and human-caused succession (Harding 2002). The story of this particular turtle is quite interesting (Spinks <i>et al</i> 2003).
<i>Apalone spinifera (pallida)</i> spiny softshell turtle	2 individuals caught and removed in 1998 and 2000, respectively		Non-native. Native in Central to Eastern U.S. Inhabits various freshwater systems with little aquatic vegetation and sandy or muddy bottoms with raised sandy areas for nesting. Able to breathe under water using pharyngeal linings, cloacal lining and skin. Preys on macroinvertebrates and fish (Bartholemew 2000).
<i>Chelydra regalis</i> snapping turtle	1 individual found and removed in 1994		Non-native. Native to Southern Canada and North America East of the Rocky Mountains. It is currently illegal to import this turtle to California (Spinks <i>et al</i> 2003). Prefer muddy bottoms and aquatic vegetation for concealment. Omnivorous and predatory, will kill other turtles by decapitation (Bosch 2003).
<i>Kinosternon subrubrum</i> eastern mud turtle	1 individual found and removed in 1997		Non-native. This species is native to the Atlantic and Gulf Coast and the Mississippi River Valley. (Spinks <i>et al</i> 2003)
<i>Chinemys reevesii</i> Reeves' turtle	1 individual found and removed in 1998		Non-native. Found in Southern China, Korea, Taiwan and Japan. Popular in pet trade.
<i>Sceloporus occidentalis</i> western fence lizard	Common		Native. Occupies a great variety of habitats. Occasionally climbs trees, but often found on or near ground. Eats insects and spiders (Stebbins 2003).
<i>Eumeces gilberti</i> Gilbert's skink	Common		Native. Varied Habitats: grassland, salt flats, high desert, open chaparral, pinon-juniper woodland, open pine forest, rocky areas near springs and streams. (Stebbins 2003)
<i>Elgaria multicarinata</i> southern alligator lizard	Common		Native. Found in grassland, chaparral, oak woodland, and open pine forest. Near streams with abundant plant cover, and may live in old woodpiles and trash heaps. Carnivorous, can eat black widows. (Stebbins 2003)
<i>Contina tenuis</i> sharp-tailed snake	Common		Native. Found in woodland, grassland, broken chaparral, pastures or open meadows, on the edge of coniferous forests, among oaks, and forests usually near streams. Keeps out of sight hidden under logs, rocks and other objects. Often found on damp soil after rains. Feeds on slugs and their eggs (Stebbins 2003)
<i>Coluber constrictor mormon</i> western yellow-bellied racer	Common		Native. Favors open habitats, both semiarid and moist. Ground dwelling. Feeds on reptiles, small mammals, birds ad eggs. (Stebbins 2003)

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Pituophis catenifer</i> <i>catenifer</i> pacific gopher snake	Common		<b>Native. Various habitats, especially common in grassland and open brushland. Good climber and burrower. Mimics rattlesnake when disturbed. Eats rodents, rabbits, moles, birds, eggs, nestlings, lizards and insects. (Stebbins 2003)</b>
<i>Lampropeltis getula</i> common kingsnake	Common		Native. Various Habitats. Eats snakes, lizards, small turtles, reptile eggs, frogs, birds, bird eggs, and small mammals. (Stebbins 2003) Found on Old Davis Rd. near Putah Creek.
<i>Thamnophis sirtalis fitchi</i> valley garter snake	Common		Native. Found in grassland, woodland, scrub, chaparral, forest and city lots. Tends to stay near water, excellent swimmer. "Spirited; often defends itself energetically when cornered. When caught it often bites and smears its captor with excrement and odorous contents of anal glands" (Stebbins 2003). Eats fish, toads, frogs, tadpoles, salamanders and their larvae, birds and their eggs, small mammals, reptiles, earthworms, slugs and leeches (Stebbins 2003).
<i>Crotalus viridis</i> <input type="checkbox"/> <i>reganus</i> northern pacific rattlesnake	Rare locally		Native. Found close to campus on Putah Creek. Various habitats. Produces neurotoxin, which can cause injury and death (Stebbins 2003). Not aggressive. Eat small mammals; ground nesting birds, amphibians and reptiles (ADW).
<b>MAMMALS: Class Mammalia</b>			
<i>Didelphis virginiana</i> Virginia opossum	Common		<b>Naturalized. Commonly photographed in West End Swale during trailmaster sessions. Habitat: cultivated and riparian areas at elevations lower than 1000m. (Wilson and Ruff 1999)</b>
<i>Sorex ornatus</i> ornate shrew	Not confirmed in Arboretum, but likely present.		Native. Restricted to the southern Pacific region. Found in Putah Creek Campus Reserve and Campus Ecosystem. Habitat: Mediterranean upland and marshland. (Wilson and Ruff 1999)
<i>Scapanus latimanus</i> broad-footed mole	Not confirmed in Arboretum, but likely present.		Native. Found in Putah Creek Campus Reserve and Campus Ecosystem. Habitat: favors light soils, found throughout much of the state below 2000 ft.
<i>Myotis yumanensis</i> Yuma myotis	Colony located under California Street Bridge		<b>Native. Found in Western Canada, U.S., and Mexico. Insectivorous. Colony located under the California Street bridge. (Wilson and Ruff 1999)</b>
<i>Lasiurus borealis</i> red bat	Not confirmed in Arboretum, but likely present.		<b>Native. Found in forested regions throughout Northern and Central America and parts of South America. Found at Briggs Hall on main campus. Insectivorous (Wilson and Ruff 1999).</b>
<i>Lasiurus cinereus</i> hoary bat	Not confirmed in Arboretum, but likely present.		Native. Widespread throughout Canada, U.S. and Central America. Found in trees near clearings including city parks. Feeds on Moths, Beetles, flies and wasps. (Wilson and Ruff 1999)
<i>Episticus fuscus</i> big brown bat	Not confirmed in Arboretum, but likely present.		Native. Found in North, Central, and South America as well as the West Indies. Habitat: cities, towns, and rural areas, not found in forested areas. Insectivorous. (Wilson and Ruff 1999)
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	In past, associated with the Myotis colony under the California Street Bridge	SSSC, 2 <sup>nd</sup> priority	<b>Native. Western U.S. through British Columbia. Uncommon in summer, often found in caves in winter months. Hibernate in caves during the winter months. Threats include disturbance, vandalism and loss of habitat. (Wilson and Ruff 1999)</b>

Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Antrozous pallidus</i> pallid bat	not confirmed in Arboretum, but likely present.	SSSC	Native. Found From Canada to Mexico. Habitat: rocky mountainous areas or open, sparsely vegetated grasslands. Roosts in buildings and rock cracks. Insectivorous, usually catching prey on foliage or ground. Easily disturbed by humans. (Wilson and Ruff 1999)
<i>Tadarida brasiliensis</i> Mexican free-tailed bat	Common		<b>Native. Frequent campus buildings. Habitat: colonial in buildings, caves, mine shafts; migratory; found across southern US to Atlantic coast. Could be encouraged to roost in bat boxes. (Wilson and Ruff 1999)</b>
<i>Canis latrans</i> coyote	Possibly one resident pair		<b>Native. Found throughout North and Central America. Incredibly adaptable. Omnivorous. Usually monogamous. Breeding occurs once a year in early to mid winter with a gestation period of 63 days. Litters average six altricial pups. Coyotes live an average of 8 years in the wild. There is great variation in social structure, from individuals living alone to large packs. (Wilson and Ruff 1999)</b>
<i>Canis domesticus</i> domestic dog	Common, brought by visitors		<b>Domestic. No wild dogs live in the Arboretum, but domestic dogs are a common predator when brought by visitors and allowed to run off leash.</b>
<i>Vulpes vulpes</i> red fox	formerly found on Arboretum,		<b>Non-native. Prefer diverse habitats and edge habitats. Uncommon in Putah Creek Campus Reserve. Opportunistic hunters and scavengers. They prefer rodents, cottontails and jackrabbits, but they will also take birds, fruits and invertebrates. Principle vector and victim of rabies in the Northern Hemisphere. (Wilson and Ruff 1999)</b>
<i>Felis silvestris</i> domestic cat	Common		<b>Domestic. House cats and ferral cats are common predaotrs in the Arboretum.</b>
<i>Erithrizon dorsatum</i> North American porcupine	Extremely rare here		Native. Northern North America. Found once on Putah Creek Campus reserve Poor eyesight, varied herbivorous diet. They can live at least ten years. Usually solitary except in winter months. (Wilson and Ruff 1999)
<i>Procyon lotor</i> Northern raccoon	not confirmed in Arboretum, but likely present.		Native. North and Central America. Found in Putah Creek Campus Reserve and Campus Ecosystem. Very well developed thermoregulatory ability allows them to inhabit hot climates. Found almost everywhere near water (Wilson and Ruff 1999). We did not observe this animal on the Arboretum through any of our monitoring efforts, but it occurs on Putah Creek and within the city of Davis.
<i>Mephitis mephitis</i> striped skunk	Confirmed near Putah Creek Lodge		<b>Native. Found throughout North and Central America except in the hottest deserts and high mountains. Often near streams and other bodies of water. Does well in Agricultural areas, common in edge habitat. Omnivorous. (Wilson and Ruff 1999)</b>
<i>Sciurus carolinensis</i> eastern gray squirrel	Not found on Arboretum, but could establish population		Non-native. Native to Southern Canada and the United States east of the Mississippi. Omnivorous scavengers. Found in many habitats. (Wilson and Ruff 1999).
<i>Sciurus griseus</i> western gray squirrel	Rare in the Arboretum	Threatened in WA; sensitive in OR	<b>Native. Distribution closely associated with oak-conifer woodlands. Distribution declining due to habitat loss. Herbivorous. (Wilson and Ruff 1999).</b>
<i>Sciurus niger</i> fox squirrel	Common		<b>Non-native. Native to the United States east of the Mississippi. Common in parks and cities (Wilson and Ruff 1999). Recently invaded UC Davis Campus, including the Arboretum.</b>
<i>Spermophilus beecheyi</i> California ground squirrel	Extremely abundant		<b>Native. Most common in Agricultural lands. Significant pest to agriculture. Strictly ground dwelling opportunistic forager. (Wilson and Ruff 1999)</b>



Scientific Name Common Name	Abundance	Conservation Status <sup>a</sup>	Natural History
<i>Thomomys bottae</i> Botta's pocket gopher	Common in grassy areas		<b>Native. Virtually statewide, except higher elevations and extreme Northeast corner of the state. Found in open habitats. Both sexes burrow and individuals defend their own burrow systems. Considered a pest, but also important for soil aeration and production (Wilson and Ruff 1999).</b>
<i>Ondatra zibethicus</i> muskrat	Once common in the Arboretum, appears to have been extirpated.		Native throughout North America. Semi-aquatic. Found on Putah Creek Campus Reserve. Crepuscular and nocturnal. They feed mainly on aquatic plants, but will also take animal material. (Wilson and Ruff 1999)
<i>Microtus californicus</i> California vole	Not confirmed in Arboretum, but likely present.		Native. The only vole in the Central Valley. Found in Putah Creek Campus Reserve and Campus Ecosystem. Lowlands and foothills in much of California up to 1500m elevation in the Sierra Nevada. Herbivorous preferring grasses, sedges, and forbs. (Wilson and Ruff 1999)
<i>Reithrodontomys megalotus</i> western harvest mouse	Not confirmed in Arboretum, but likely present.		Native. Habitat: varies, but often in brushy areas with dense grasses and open habitats; throughout California in low and medium elevations. Found in Putah Creek Campus Reserve and Campus Ecosystem. Opportunistic forager taking seeds, insects and herbs. (Wilson and Ruff 1999)
<i>Peromyscus maniculatus</i> deer mouse	Not confirmed in Arboretum, but likely present.		Native. Habitat: nearly anywhere; one of the most common mammals in much of North America. Most widespread North American rodent. Found in Putah Creek Campus Reserve and Campus Ecosystem. Crepuscular and nocturnal. Opportunistic forager. Primary host of hantavirus. (Wilson and Ruff 1999)
<i>Mus musculus</i> House mouse	Unconfirmed, but likely present		Non-native. Found in Putah Creek Campus Reserve and Campus Ecosystem. Commensally with humans, also invading many habitats where it may be evicting many species. (Wilson and Ruff 1999)
<i>Rattus norvegicus</i> Norway rat	Common	Invasive	<b>Non-native. Commensally with humans, also invading many habitats where it may be evicting many species.</b>
<i>Rattus rattus</i> Black rat, Roof rat	Common	Invasive	<b>Non-native. Commensally with humans, also invading many habitats where it may be evicting many species.</b>
<i>Lepus californicus</i> Black-tailed jackrabbit	Common	Invasive	<b>Native. Common in open fields adjacent to Garrod Rd. Found throughout most of California to about 2500m elevation.</b>
<i>Sylvilagus audubonii</i> Audubon's cottontail	Common	Invasive	<b>Native. Found throughout the Arboretum, but most abundant in large rosemary bushes of the Mediterranean Section. Very common in the southern 2/3 of California.</b>

## <sup>a</sup> Conservation Status

### Federal and State Designations

Threatened or Endangered: Most birds are protected under the Migratory Bird Treaty Act (16 U.S.C. 703–711). However, before a plant or animal species can receive protection under the Endangered Species Act, it must first be placed on a federal or state list of endangered and threatened wildlife and plants. An “endangered” species is one that is in danger of extinction throughout all or a significant portion of its range. A “threatened” species is one that is likely to become endangered in the foreseeable future (USFWS 2006).

California State Species of Special Concern: “Species of Special Concern (SSSC) status applies to animals not listed under the federal Endangered Species Act or the California Endangered Species Act, but which nonetheless are declining at a rate that could result in listing, or historically occurred in low numbers and known threats to their persistence currently exist.” (CDFG 2006)

Watchlist, stable or increasing, widespread and stable, and aggressive invader classifications to indicate distribution, status and lifestyle of each fish species after Moyle (2002).

Sensitive: a species that is experiencing dramatic population declines across all or part of its range, but is not covered by federal or state protections.

Riparian Indicator Species: a species that spends all or a significant portion of its life in riparian areas and is a good indicator of riparian habitat quality. Often tied to riparian resources, such as nectar sources or larval host plants in the case of Lepidopterans, for its survival.

Invasive: a species, generally nonnative, that can outcompete native species by better exploiting resources or avoiding predation.

### **Literature cited**

- AmphibiaWeb: Information on amphibian biology and conservation. [web application]. 2006. Berkeley, California: AmphibiaWeb. Available: <http://amphibiaweb.org/>. (Accessed: 10 October 2005).
- Bartholomew, P. 2000. "Apalone spinifera" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Apalone\\_spinifera.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Apalone_spinifera.html).
- Brock JP, Kaufman K. 2003. Butterflies of North America; Kaufman focus guides. New York: Houghton Mifflin Co. 384 p.
- Bosch, A. 2003. "Chelydra serpentina" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Chelydra\\_serpentina.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Chelydra_serpentina.html).
- CDFG. 2006. California Department of Fish and Game web page. <http://www.dfg.ca.gov/hcpb/species/ssc/ssc.shtml>. Accessed on 4 January 2006.
- Gardiner, K. 2000. "Pseudemys concinna" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Pseudemys\\_concinna.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Pseudemys_concinna.html).
- Godfrey LD. 2004. Rice Crayfish. In: UC IPM Pest Management Guidelines: Rice. UC ANR Publication 3465. University of California agriculture and natural resource. Davis (CA): IPM Education and Publications. Available from: <http://www.ipm.ucdavis.edu>.
- Harding, J. 2002. "Clemmys muhlenbergii" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Clemmys\\_muhlenbergii.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Clemmys_muhlenbergii.html).
- Herpnet (On-line) Accessed at: <http://herpnet.org/>. Accessed on 10 October 2005.
- Knipper, K. 2002. "Chrysemys picta" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Chrysemys\\_picta.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Chrysemys_picta.html).
- Kuhr, T. and T. Dewey. 2002. "Trachemys scripta" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Trachemys\\_scripta.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Trachemys_scripta.html).
- Moyle PB. 2002. Inland fishes of California: revised and expanded. Berkeley (CA): University of California Press. 502 p.
- Rogers, J. 2000. "Procambarus clarkii" (On-line), Animal Diversity Web. Accessed January 06, 2006 at [http://animaldiversity.ummz.umich.edu/site/accounts/information/Procambarus\\_clarkii.html](http://animaldiversity.ummz.umich.edu/site/accounts/information/Procambarus_clarkii.html).
- Spinks PQ, Pauly GB, Crayon JJ, Shaffer HB. 2003. Survival of the Western Pond Turtle (*Emmys marmorata*) in an urban California Environment. *Biological Conservation* 113: 257-267.
- Stebbins, R.C. (1951). *Amphibians of Western North America*. University of California Press, Berkeley.
- Stebbins, Robert C. (1972). *Amphibians and Reptiles of California*. University of California Press, Berkeley, Los Angeles, London.
- Stebbins, Robert C. (1985). *A Field Guide to Western Reptiles and Amphibians*. Houghton Mifflin, Boston.
- Stebbins RC. 2003. *A field guide to western reptiles and amphibians: Third edition [The Peterson field guide series]*. Boston (MA): Houghton Mifflin Co. 533 p.
- Wilson DE and Ruff S, editors. 1999. *The Smithsonian book of North American mammals*. Smithsonian Institution. 750 p.