

A Guide to the Dark-Eyed Junco, *Junco hyemalis*: history, identification, nest-searching and habitat.

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History of the Dark-eyed Junco

The Dark-eyed Junco (*Junco hyemalis*) is a species of sparrow most often found in the mountains in coniferous (Unitt, 1984; Terres, 1991) and live Oak woodlands (Unitt, 1984). In the past, juncos were divided into a number of distinct species. However, the American Ornithologists' Union determined in 1973 that they were in fact simply subspecies of the Dark-eyed Junco, *Junco hyemalis* (Terres, 1991). Juncos frequent San Diego County annually and are one of the most common winter visitors (Unitt, 1984). Typically, they arrive in San Diego between mid-September to mid-October and return to higher elevations anywhere from mid to late April (Unitt, 1984). However, within the last 17 years, juncos have invaded the urban environment of U.C. San Diego and established a breeding population on the campus. Currently between 70-90 pairs have been recorded at UCSD (P. Yeh, personal communication).

Basic Information

Dark-eyed Juncos have very distinctive markings which make them easily identifiable in the field. Males have a characteristically dark hood, ranging from black to dark gray, with a brownish back and white belly (Terres, 1991). The white outer tail feathers (outer retrices, Cristol et al., 1992) are easy to spot in flight, and are often displayed with a quick flicking motion while foraging on the ground (Cristol et al., 1992; personal observation). The bill is flesh colored, and their eyes are brown. Females are similar to males with the exception of a paler hood, often a soft brown or light gray. Immature Juncos resemble sparrows, with a streaked brown plumage that develops into adult plumage within 2-3 months after hatching (Phelps, 1968 in Terres, 1991). Until their hoods darken, immatures are difficult to sex visually (Mulvihill & Winstead, 1997; personal observation). Juncos reach adulthood following their typically incomplete first prebasic molt, at which time the body feathers are the most common feathers replaced (Mulvihill & Winstead, 1997).

It has been proposed that plumage plays an important role in determining dominance status between individuals, as well as within wintering flocks (Holberton, et al., 1989; Holberton et al., 1990; Grasso et al., 1996; Wiley, 1990). Holberton et al. (1989) and Grasso et al. (1996) found that by manipulating plumage (i.e. darkening the hood and whitening the tail feathers), previously established dominant-subordinate

relationships could be reversed allowing newly dominant individuals to dominate food sources (Holberton et al., 1989) or win antagonistic contests (Grasso et al., 1996). However, Grasso et al. (1989) was able to improve past experimental designs through isolation of test subjects prior to dominance trials. Their results suggest that individual recognition might play an important role in establishing dominances. Cristol et al. (1990) explored similar venues of dominance determinance, and found that the advantage of prior residence overcame the typical dominance of adults over young. Holberton et al.'s (1990) research concurred, suggesting that age and prior residence were additive components. Wiley's (1990) findings weighed recognition and/or previous experience as a higher determinant than prior residence.

Juncos are approximately 5-6 inches in length (Phelps, 1968 in Terres, 1991), have been recorded in flight up to 26 m.p.h (Cottam et al, 1942b. in Terres, 1991) and weigh within a range of 18.94-22.64 grams (Anderson, 1970 in Terres, 1991; Chandler & Mulvihill, 1992). Chandler and Mulvihill (1992) found that male Juncos are significantly heavier than females. In particular, they noted that greater body masses and wing areas resulted in smaller wing loadings (body weight per unit wing area) for males. This suggests a higher maneuverability advantage for males, and a respective lesser maneuverability advantage for females. Tradeoffs for such agility might result in sex-specific differences in predator avoidance, foraging behavior and social interactions (Chandler & Mulvihill, 1992). However, the costs of maintaining high levels of body fat might be advantageous during the onset of winter. Rogers (1995) suggests that in order to regulate winter fattening, juncos utilize local temperatures and resource predictability to adjust fat reserves, a regulatory system known as a *responder*. This environment-dependant fattening allows them to minimize the costs of fat reserves during warm periods, yet quickly adapt to harsh weather conditions and limited food resources (Rogers et al, 1994; Rogers, 1995). Given an optimal survival rate, banded individuals have been recorded as old as 8 years, 4 months of age (Terres, 1991).

Throughout the year, a junco's diet consists primarily of weed seeds such as Hairy Vetch (*Vicia villosa*), Sweet Clover (*Melilotus officinalis*), Foxtail (*Setaria glauca*) (O'Leske & Robel, 1996), Niger Thistle (*Guizotia abyssinica*), Canary Grass (*Phalaris canariensis*), Millet (*Panicum milliaceum*) and Flax (*Linum usitatissium*) (Goldstein & Baker, 1984), as well as waste grain during the fall and winter, and insects while nesting (Hostetter, 1961; Terres, 1991). Holmes and Robinson's (1988) study of foraging tactics and diets found that juncos spent a greater percent of their foraging time towards prey located on forest litter, foliage, and bark. The junco's primary foraging tactic was gleaning (picking prey from the surface of a plant or off the ground), with lesser occurrences of hovering (snatching prey from a substrate while in flight), jump/hovering (jumping from the ground to grab prey from the undersurface of a leaf), probing (when a

bird's beak moves, disturbs or enters the substrate to obtain prey) and hawking (chasing and capturing air-borne insects while in flight). Holmes and Robinson (1988) described their behavior while foraging as hopping along the ground in search of prey, pausing only for deliberate gleaning with quick pecking motions.

Nests are predominantly built by the female in cup-shaped depressions near the ground (Hostetter, 1961; Martin, 1998; Terres, 1991; Wolf et al., 1988, Wolf et al., 1991). They are often concealed at the base of shrubs and weeds, beneath tree roots, stumps, and fallen logs, in small trees and bushes, nestled in patches of ivy, beneath overhanging banks along roads and streams (Hostetter, 1961; Terres, 1991; personal observation) and in areas with high ground cover (Martin, 1998; personal observation). Typically, the nests are built out of mosses, twigs, grasses, strips of bark and rootlets, and are lined with grasses, sedges and hairs (Hostetter, 1961; Terres, 1991). The breeding season usually lasts between March and August, during which time anywhere from 3-5 eggs can be found, although 4 is typical (Hostetter, 1961; Terres, 1991; Wolf et al., 1991). Eggs are characteristically white to a pale blue-white, with brown and gray speckles or spots (Terres, 1991), often with a cinnamon crown of blotches or fine speckles at the larger end (Hostetter, 1961).

During the breeding season, male juncos tend to sing more often, perhaps to attract mates or for territorial defense (Titus et al., 1997). Songs are usually sung in bouts from exposed, elevated perches (Hostetter, 1961; Williams & MacRoberts, 1977; personal observations) such as dead limbs, telephone wires (Hostetter, 1961), tree branches, street lamps and building tops (personal observation). Juncos have been noted to have repertoires of as many as seven different song types, each of which is highly stereotyped (Williams & MacRoberts, 1977). Within a bout, the same song can be repeated as many as 120 times in succession, with intervals of 2 to 7 seconds between each song (Williams & MacRoberts, 1977). Before changing song types, however, juncos usually move to another perch or perform another activity (Williams & MacRoberts, 1977; personal observation). Konishi's (1964) experiments on deafening and song development indicate that the normal properties of junco song do not require external auditory reference, nor do they require auditory feedback in order to develop these properties.

Brood parasitism by Brown-headed Cowbirds (*Molothrus ater*) is not uncommon amongst juncos. Since they themselves don't build nests (Dufty, 1982), Cowbirds are opportunistic parasites that lay their eggs in the nests of other small passerine birds, most often sparrows, warblers, vireos and flycatchers (Payne, 1973). A member of the sparrow genus, Dark-eyed Juncos have been observed as hosts to cowbird parasitism both on campus and in the mountains (personal observation). Throughout a season, cowbirds annual clutch sizes vary, ranging anywhere from a conservative eleven to twenty-five

(Payne, 1976), to a high end estimate of thirty (Payne, 1973) to forty eggs per female (Scott & Ankney, 1982). Typically, female cowbirds lay an egg in the nest of their host, often times removing one of the host eggs at the same time (Wolf, 1987). Carey (1986) suggests that cowbirds might also pierce one host egg with their beak, in effect killing that egg. Parasitism occurs throughout the day, and there are recorded instances of overlap where more than one cowbird egg from separate females are found within the same nest (Wolf, 1987). Once parasitized, host parents have a number of options, including ejection of the parasitic egg, nest desertion, piercing the parasitic egg's shell, and egg burial (rebuilding one's new nest atop the previously parasitized nest) (Rothstein, 1975). Wolf (1987) found that the cowbirds' parasitism of host nests was timed in such a way that their young tended to hatch earlier than junco young, resulting in considerably larger cowbird nestlings compared to junco nestlings. Although she found that fewer juncos eggs survived (due to egg mortality during parasitism and removal), parasitized and nonparasitized junco nestlings had a comparable survival rate after hatching.

Banding/Identification

For individual recognition, each junco on campus is caught for a short period of time and banded with colored plastic bands and an aluminum ID band authorized by the Bird Banding Laboratory and the U.S. Fish and Wildlife Service. When the chicks are banded, there is a number of data recorded for each chick. Each chick is fitted with the metal and color bands, whose number and color sequence are permanently recorded. Then, each chick is weighed, and the length of their tarsus (thigh) recorded. Blood samples are also taken, which will aid in determining their sex prior to maturation. If Brown-headed Cowbird (*Molothrus ater*) chicks are present, they are metal banded only, and their weight and tarsus measures are taken.

The timing of nestling banding is critical. Hostetter (1961) observed that nestlings banded day six or earlier were often removed from the nest and discarded like foreign debris such as intrusive twigs and small stones. However, if the nestlings were banded with material that was easy to remove prior to day six or seven, only the banding material was removed. He also found that banding beyond day nine often resulted in fledgling the nestlings prematurely. As a result, chicks are banded prior to fledgling at approximately day 7, while adults are caught with the aid of mist nets and potter traps. The metal band is always placed on their left tarsus, and the remaining color bands are read from the bird's point of view, left to right, top to bottom (Fig. 1)

<u>LEFT</u>	<u>RIGHT</u>
1	2
M	3

(Figure 1)

For example, an individual with the color bands in Figure 2 would be referred to as Red-Yellow-Dark Blue, abbreviated RYDb. The metal band is ignored, since the inscribed numbers are far too difficult to read.

<u>LEFT</u>	<u>RIGHT</u>
Red	Yellow
M	Dark Blue

(Figure 2)

At present, 9 different color bands are in use, including Red (R), Yellow (Y), Orange (O), Light Green (Lg), Dark Green (Dg), Light Blue (Lb), Dark Blue (Db), Purple (P), and White (W). Additionally, pairs are further identified by the territory they frequent, such as Geisel DgWDb (Geisel Library) or Galbraith WRY (Galbraith Hall). Following the abbreviated RYDb, ♂ or ♀ are used to indicate a male or female, respectively. Experimental data from Cristol et al. (1992) suggests that color bands (orange, red-green [bicolored], black, and white were tested) do not influence dominance status among wintering juncos. Although the birds may pick at them for a short time, the bands are harmless and should not affect the birds adversely (Hostetter, 1961).

Nest Searching

At UCSD, nest searching is an integral part of our research, and perhaps the most time consuming. In and of itself, nest searching requires patience and vigilance. The more experienced the observer, the more they come to recognize behaviors and quirks that are learned only by hours in the field. Although this *is* a guide to nest searching, there is no better teacher than Mother Nature herself. Since this study concerns two very different environments, nest searching both on campus and in the mountains are described in detail below, including more in-depth Appendixes of flora (Appendixes A-B) and fauna (Appendixes C-D) at the end of this guide. Detailed maps of breeding distributions, principal localities, topography and vegetation communities of San Diego county can be found in Appendix E.

Nest Searching on the UC San Diego Campus

Compared to the mountains, U.C. San Diego is an environment characterized by heavy disturbances and urbanization, as well as heavy automobile and foot traffic throughout the day. At present, there are approximately 18,667 undergraduate, graduate, and medical students enrolled (UCSD Comm., 1999). In Winter quarter of 1999, a survey found that on average, around 27,948 vehicles and 35,425 people enter central campus daily, between the hours of 6AM to 10PM, and during that same time period, around 24,012 vehicles and 30,490 people exit central campus. Compare this to Winter quarter of 1997, where around 26,367 vehicles and 33,977 people entered central campus, and around 25,454 vehicles and 32,643 people exited (UCSD Trans., 1999). The property as a whole consists of an estimated 1,202 acres (UCSD-CPOb., 1989). The campus itself can be broken down into six habitats, three of which are native wildlife, and three of which are non-native. The native wildlife habitats [see Appendix B] include chaparral, coastal sage scrub, and riparian habitats, while the non-native habitats include eucalyptus groves, grasslands, and landscaped areas. In addition to a wide array of flora, there have been fourteen mammalian, fifty-one avian, and five reptile species [see Appendix D] recorded on U.C. San Diego property (RECON, 1989; personal observation).

As described above, Dark-eyed Juncos are ground nesting birds. Typical nest sites include shrubs, embankments, fallen logs, tree roots, stumps (Hostetter, 1961; Terres, 1991; personal observation) and groundcovers (Martin, 1998; personal observation). With the development of UCSD in mind, juncos on campus have also been found nesting on buildings concealed in ivy, recessed in lighting fixtures, within enclosed courtyards, in flower pots, and on trellis'. Scouring the campus rummaging through shrubs is futile at best. Nest searching is not so much looking for the nest itself as it is letting the birds lead you to the nest.

Once you have familiarized yourself with the Dark-eyed Junco, the best approach for finding nests is to locate foraging individuals or pairs. Optimal hours for nest searching are generally between sunrise and eleven o'clock when they tend to be the most active. Although we have heard junco songs as early as four in the morning, the absence of sunlight makes it a fruitless task before sunrise. Two of the most important ways to locate juncos are visually and acoustically. Visually, it is important to remember their characteristic plumage and distinct tail feathers, which are most apparent in flight. Acoustically, the junco's song is distinct and difficult to confuse with any other song bird on campus.

There are three distinct phases of nesting activity during the breeding season, which include nest building, an incubation period, and feeding of the nestlings/fledglings. During each phase, males and females exhibit different behaviors which provide clues as

to how far along the pair might be in the nesting process. During the primary phase, female juncos are predominantly responsible for building the nest (Hostetter, 1961; Terres, 1991; Wolf et al., 1991). As soon as a suitable nest site has been chosen, loose debris is removed and a depression is scratched out. Hostetter (1961) defined three distinct parts of a juncos' nest which he described as the foundation, cup and lining. Prior to the actual construction of the foundation, females tend to "test" nesting material, picking up branches and twigs and then dropping them. Once construction of the foundation has begun, she will pick up clumps of rootlets, dried leaves and bark. These are laid haphazardly, covering the entire depression. As soon as the foundation is complete, the cup is built with finer rootlets and grass stems with considerably more attention and careful arrangement. These are intertwined with the female's bill and feet, and the shape of the cup defined by her fluffing herself and vibrating while in the nest. Lastly, the lining is chosen with deliberate care. It is composed of the finest grass stems, hairs, or moss setae. It too is interwoven with the greatest precision, similar to the cup. Although the construction itself is difficult to observe, to the naked eye the completion of the nest can best be determined by the size of the building material observed in the junco's bill. As the nest nears completion, the nesting materials she collects will become smaller and finer, from rootlets and grass blades to fine hairs and grasses. Hostetter (1961) found that on average, the outer diameter of nests was 4.20 inches, with an inside diameter of 2.49 inches, a nest cavity depth of 4.32 inches, and a nest depth of 1.69 inches.

Once the nest is complete, the female will lay approximately four eggs (Hostetter, 1961; Terres, 1991; Wolf et al., 1991), one per day in succession. The incubation period follows soon after the third egg is laid (Hostetter, 1961) and lasts about 11-12 days (Hostetter, 1961; Terres, 1991). This can often be the most frustrating time to nest search. During this period, females rarely leave the nest except for quick foraging bouts, and males tend to sing and forage ceaselessly without returning to the nest (Hostetter, 1961; personal observation). During their quick respites, incubating females often forage in a hurried fashion, and are quick to return to their nests.

After the incubation period, the young will hatch, and both parents will begin to feed their nestlings throughout the day. The foraging behavior of the pair during this period is hurried as well, but is characterized by repeated trips back and forth between the nest. While foraging, the parents pick up moths, worms and small insects and return to the nest with the prey still in their beak. As they approach the nest, however, they tend not to enter immediately. Instead, they often perch within the vicinity of the nest and check for possible predators. Once assured, they will enter the nest in a decisive, deliberate manner as quickly as possible. With the aid of binoculars, this behavior is unmistakable, but is equally as evident to the naked eye. Often times, nestlings will greet

returning parents with a begging call, which can be heard if one listens carefully. Hostetter (1961) found that junco nests are kept meticulously clean. He observed females eating both discarded egg shells from hatchlings, as well as their excretory sacs. After day four or five, however, the excretory sacs were habitually removed by the parents and deposited elsewhere.

In a comparison of feeding rates between aided and unaided females, Wolf et al. (1988; 1990) found that unaided females were likely to work harder, doubling feeding trips in order to compensate for the males' absence. This in turn led to a decrease in brood time, resulting in slower growth and lower survival of unaided females' nestlings. Juncos are monogamous (Wolf et al., 1988; Wolf et al., 1990; Wolf et al., 1991) and raise two, occasionally three broods a year (Hostetter, 1961; Wolf et al., 1991). After the female has initiated incubation of a second clutch, she essentially ignores her first brood's fledglings and the male assumes responsibility for feeding them (Wolf et al., 1991).

When scouting out a potential nesting site, there are several general guidelines one should follow to prevent the pairs from abandoning their nests. As a general rule, observers should maintain a respectable distance from the juncos in question, usually as far back as 20-30 feet and out of sight if possible. Their eyesight is equal to, if not superior to ours, and they will often "spook" if they mistake you for a predator. This is often the case if they are observed dropping nesting materials or food items destined for nestlings. If either parent recognizes you as a potential threat, they will often give an irritation call as you approach potential nest sites or fledged young. It is also important to avoid advertising potential or known nest sites to predators such as Ravens (*Corvus corax*), Scrub Jays (*Aphelocoma coerulescens*) and Brown-headed Cowbirds (*Molothrus ater*). Once a potential nest site has been pin-pointed, it is important to continue to watch the nest and wait for 3-4 return visits, making note of the nest to within a square foot radius. In heavier ground cover and shrubs, juncos may access the nest through one opening and leave through another, both of which are important to remember. It is always best to wait until both parents have left the nest site before checking for a nest. However, if the female is brooding, gently running your hand through the brush will often flush the female from the nest, accompanied by an irritation call.

Nest Searching in the Mountains

Within the mountains of San Diego county, the Dark-eyed Junco is most often restricted to coniferous mountain forests (Beauchamp, 1986; Terres, 1991; Unitt, 1984) and live Oak woodlands (Beauchamp, 1986; Unitt, 1984). These habitats [see Appendix A] include, but are not restricted to, riparian woodland edges, chaparral, mountain meadows and grasslands (Beauchamp, 1986; Terres, 1991; Unitt, 1984), and along unfrequented woods roads (Terres, 1991). These regions also encompass a number of

avian and mammalian species [see Appendix C]. Within San Diego county in particular, these zones include the Palomar, Hot Springs, Volcan, Cuyamaca, and Laguna mountain ranges (Unitt, 1984).

Compared to the UC San Diego campus, there are very few differences in the actual nest searching procedure. As on campus, the optimal time to begin nest searching is at sunrise, however, junco activity seems more dependant on the ambient temperature and tends to drop off quickly as the morning heats up. During the warmer months, junco activity tapers considerably as early as nine-thirty in the morning. Unlike the campus, however, nearly all territory on the forest floor is fair game. In the absence of buildings, paths and parking lots, the potential nesting sites available to nesting pairs are greatly increased. During our mountain fieldwork, junco nests were found at the base of shrubs, within shrubs, beneath overturned logs, along embankments, within clumps of grass, and within moss-lined recesses in the ground. We also noted that mountain juncos' hoods tended to be darker, especially with respect to the female, making it more difficult to differentiate the sexes visually.

APPENDIX A
FLORA OF SAN DIEGO COUNTY'S MOUNTAIN ENVIRONMENT

(the following information is from Beauchamp, 1986)

Montane Coniferous Forests

Elevation – 3500-4000 feet (1050-1200 meters)

Annual Precipitation – 18-20 + inches (45-50 + cm.) w/ some snow

Areas within S.D. County – Mount Laguna, Cuyamaca Mountains, Corte Madera, Mountain, Volcan Mountain, Pine Valley, Pine Hills, Julian, Pine Mountain, Angel Mountain, Hot Springs Mountains, Bucksnot Mountains, San Ysidro Mountains N. of Ranchita, Palomar Mountain, and Agua Tibia Mountains

Characteristics – areas can differ greatly in species composition

Examples – Ponderosa Pine (*Pinus ponderosa*), White Fir (*Abies concolor*), Sugar Pine (*Pinus lambertiana*), Big-cone Douglas Fir (*Pseudotsuga macrocarpa*), Jeffrey Pine (*Pinus jeffreyi*), Black Oak (*Quercus kelloggii*), Canyon Live Oak (*Quercus chrysolepis*), Coast Live Oak (*Quercus agrifolia*), Coulter Pine (*Pinus coulteri*)

Oak Woodlands (Canyon Oak Woodland/dense phase)

Elevation – foothill peaks and valleys

Annual Precipitation – *not specified*

Areas within S.D. County – San Clemente Canyon, Del Dios and De Luz east to Potrero, Descanso, Morena Valley, Alpine, Black Canyon, Boulevard, Escondido, Fallbrook, Corte Madera, Buatay, Oak Grove and Ranchita

Characteristics – Coast Live Oak (*Quercus agrifolia*) and Canyon Live Oak (*Quercus chrysolepis*) predominate, forming dense canopies in canyon bottoms, north facing slopes, and around small valley edges. Coast Live Oak is more common in the woodlands and lower elevations, Canyon Live Oak is more common above 4000 feet (1200 meters)

Examples – Coast Live Oak (*Quercus agrifolia*), Canyon Live Oak (*Quercus chrysolepis*), Poison Oak (*Toxicodendron radicans* ssp. *diversilobum*), Currant and Gooseberry (*Ribes* spp.), Elderberry (*Sambucus mexicana*, *S. caerulea*)

Oak Woodlands (Southern Oak Woodland/sparse phase)

Elevation – foothills and mountains

Annual Precipitation – 17-18+ inches (43-45+ cm.)

Areas within S.D. County – Paradise Mountain area, Rancho Guajito region, Wynola, Witch Creek, Ballene, Santa Isabel, Mesa Grande

Characteristics – areas prone to hot summers, Engelmann Oak (*Quercus engelmannii*) is the most dominant tree

Examples – Engelmann Oak (*Quercus engelmannii*), Coast Live Oaks (*Quercus agrifolia*), Black Oaks (*Quercus kelloggii*), White Sage (*Salvia apiana*); occasionally Chamise (*Adenostoma fasciculatum*), Mission Manzanita (*Xylococcus bicolor*), Cleveland Sage (*Salvia clevelandii*), Black Sage (*Salvia mellifera*), and Coast Spice Bush (*Cneoridium dumosum*)

Mixed Evergreen

Elevation – mesic areas, along creeks, and at mountain springs

Annual Precipitation – *not specified*

Areas within S.D. County – limited occurrence

Characteristics – associated with Mixed Chaparral or Montane Coniferous forests

Examples – Big Leaf Maple (*Acer macrophyllum*), Bay Laurel (*Umbellularia californica*), Flowering Dogweed (*Cornus nuttallii*), Western Azalea (*Rhododendron occidentale*), California Spikenard (*Aralia californica*), Madrone (*Arbus menziesii*), Canyon Live Oak (*Quercus chrysolepis*) and Black Oak (*Quercus kelloggii*)

Riparian Woodland

Elevation – *not specified*

Annual Precipitation – *not specified*

Areas within S.D. County – Santa Margarita River, Sandia Creek, San Luis Rey River, San Diego River, Old Mission Dam area, Sweetwater Reservoir, Sweetwater River, Otay River Valley, Tijuana River, and Cottonwood Creek.

Characteristics – composed of winter-deciduous trees, occurs in small, moist canyons and drainage bottoms in the mountains, creek beds, eastern mountain slopes and coastal river valleys

Examples – Willow (*Salix* ssp.), White Alder (*Alnus rhombifolia*), California Sycamore (*Platanus racemosa*), Ash, (*Fraxinus oregana* var. *velutina*), Cotton Wood (*Populus fremontii* and *P. trichocarpa*), Mugwort (*Artemisia douglasiana*), False Indigo (*Amorpha fruticosa*), Mule-fat (*Baccharis glutinosa*), Stinging Nettle (*Urtica dioica* ssp. *holosericea*), and Wild Grape (*Vitis girdiana*)

Chamise Chapparal

Elevation – *not specified*

Annual Precipitation – 12-25 inches (30-62 cm.) w/ fog drip

Areas within S.D. County – Miramar, Santee, Lakeside, Ramona, Alpine, Barrett

Junction, Chihuahua Valley, Ranchita and Boulevard
Characteristics – predominated by Chamise (*Adenostoma fasciculatum*)
Examples – Chamise (*Adenostoma fasciculatum*), Mission Manzanita (*Xylococcus bicolor*), Cleveland Sage (*Salvia clevelandii*), Black Sage (*Salvia mellifera*), Coast Spice Bush (*Cneoridium dumosum*), and Redshank (*Adenostoma sparsifolium*)

Mixed Chaparral

Elevation – *not specified*

Annual Precipitation – 11-35 inches (27-88cm.)

Areas within S.D. County – Encinitas, Sutherland Reservoir, Tecate, Otay, Jauml Mountains, San Miguel Mountains, Cuyumaca Mountains, Palomar Mountains, Campo, Rainbow and De Luz

Characteristics – species composition differs throughout county

Examples – Coast White-lilac (*Ceanothus verrucosus*), Ramona Lilac (*Ceanothus tomentosus*), Del Mar Manzanita (*Arctostaphylos glandulosa* ssp. *Crassifolia*), Holly-leaf Redberry (*Rhammus ilicifolia*), Smooth Mountain-Mahogany (*Cercocarpus minutiflorus*), Bush Poppy (*Dendromecon rifida*), Scrub Oak (*Quercus dumosa*), Chamise (*Adenostoma fasciculatum*), White-stem Wild-lilac (*Ceanothus leucodermis*), Thicket Wild-lilac (*Ceanothus crassifolius*), Bigberry Manzanita (*Arctostaphylos glauca*), Our Lord's Candle (*Yucca whipplei*), Tecate Cypress (*Cypressus guadalupensis* ssp. *forbesii.*), Southern Mountain Misery (*Chamaebatia australis*), San Miguel Savory (*Satureja chandleri*) Gander Pitcher Sage (*Lepechinia ganderi*), Otay Manzanita (*Arctostaphylos otayensis*), Mexican Manzanita (*Arctostaphylos pungens*), Coahuilla Manzanita (*Arctostaphylos pringlei*), and Palmer Ceanothus (*Ceanothus palmeri*)

Grasslands

Elevation – mountains, foothills, and coastal regions.

Annual Precipitation – *not specified*

Areas within S.D. County – San Jose de Valle and Chihuahua Valley

Characteristics – areas dominated by herbaceous plants, most commonly grasses, occur in the mountains, foothills, and coastal regions

Examples – weedy species such as Wild Oat (*Avena fatua*, *A. barbata*), Red Brome (*Bromus rubens*), Soft Chess (*Bromus millis*), Ripgut (*Bromus diandrus*), Foxtail (*Hordeum murinum*), Fescue (*Vulpia octoflora*, *V. megalura*), herbaceous dicots such as Filaree (*Erodium cicutarium*, *E. botrys*), Mustard (*Brassica migra*, *B. rapa*, *B. geniculata*), Hedypnois (*Hedypnois cretica*), Bur-clover (*Medicago*

polymorpha), Star-thistle (*Centaurea melitensis*), and native grasses (*Stipa*, *Elymus*, *Muhlenbergia*, *Poa*)

Montane Meadow

Elevation – 3500-4000 feet (1050-1200 meters)

Annual Precipitation – 18-20+ inches (45-50+cm.)

Areas within S.D. County – Laguna Mountains, around Cuyumaca Lake, and Palomar Mountain

Characteristics – moist environment

Examples – Native perennial grasses (*Elymus*, *Muhlenbergia*, *Poa*), small rushes (*Juncus*) and sedges (*Carex*) mixed with herbaceous dicots and annual grasses

APPENDIX B
FLORA OF UC SAN DIEGO'S CAMPUS ENVIRONMENT

(unless otherwise noted, the following information is from RECON, 1989)

U.C. San Diego Campus (Native Chaparral)

Elevation – 50-400 feet (15-120 meters) (UCSD-CPOa., 1989)

Annual Precipitation – 10 inches (25 cm.) (Elford & Stilz, 1970)

Areas within UCSD campus – mesa tops, and moist north-facing canyon slopes and canyon bottoms

Characteristics – major canyons fed by ephemeral streams

Examples – Chamise (*Adenostoma fasciculatum*), Wild Onion (*Allium haemotochiton*), Manzanita (*Arctostaphylos glandulosa*), California White-lilac (*Ceanothus verrucosus*), Short-leaved Dudleya (*Dudleya brevifolia*), California Encelia (*Encelia californica*), Rush-Rose (*Helianthemum* sp.), Four-O'Clock (*Mirabilis* sp.), Bermuda Buttercup (*Oxalis pes-caprae*), Scrub Oak (*Quercus dumosa*), Redberry (*Rhamnus crocea*), Sugarbush (*Rhus ovata*), Winter Currant (*Ribes indecorum*), Blue-eyed Grass (*Susyrinchium bellum*), Wreath Plant (*Stephanomeria* sp.), Mission Manzanita (*Xylococcus bicolor*), Mohave Yucca (*Yucca schidigera*), Our Lord's Candle (*Yucca whipplei*), and Fremont's Camas (*Zigadenous fremontii*)

U.C. San Diego Campus (Native Coastal Sage Scrub)

Elevation – 50-400 feet (15-120 meters) (UCSD-CPOa., 1989)

Annual Precipitation – 10 inches (25 cm.) (Elford & Stilz, 1970)

Areas within UCSD campus – mesa tops, and drier south-facing canyon slopes and canyon bottoms

Characteristics – major canyons fed by ephemeral streams

Examples – Wild Onion (*Allium haemotochiton*), California Sagebrush (*Aretmisia californica*), California Encelia (*Encelia californica*), California Buckwheat (*Eriogonum fasciculatum*), Deerweed (*Lotus scoparius*), Laurel Sumac (*Rhus laurina*), Lemonadeberry (*Rhus integrifolia*), White Sage (*Salvia apiana*), Ashy Spike-moss (*Selaginella cinerascens*), Giant Wild Rye (*Elymus condensatus*), Barrel Cactus (*Ferocactus viridescens*), Toyon (*Heteromeles arbutifolia*), Prickly-pear (*Opuntia oricola*), Coastal Prickly-pear (*Opuntia littorales*), Coastal Cholla (*Opuntia prolifera*), Saltbush (*Atriplex* sp.), Sea-dahlia (*Coreopsis* sp.), Dudleya (*Dudleya* sp.), Bladderpod (*Isomeris arborea*), and Sea-blite (*Suaeda californica*)

U.C. San Diego Campus (Native Riparian)

Elevation – 50-400 feet (15-120 meters) (UCSD-CPOa., 1989)

Annual Precipitation – 10 inches (25 cm.) (Elford & Stilz, 1970)

Areas within UCSD campus – small areas present east of Interstate 5

Characteristics – areas relatively small in size, predominated by young Willow trees

Examples – Sedge (*Carex* sp.), Spike-Sedge (*Eleocharis* sp.), Rush (*Juncus* sp.), Black Willow (*Salix goodingii*), White Willow (*Salix lasiolepis*), Bulrush (*Scirpus* sp.), and Cattail (*Typha* sp.)

U.C. San Diego Campus (Eucalyptus Groves)

Elevation – 50-400 feet (15-120 meters) (UCSD-CPOa., 1989)

Annual Precipitation – 10 inches (25 cm.) (Elford & Stilz, 1970)

Areas within UCSD campus – form a nearly continuous band through campus from
Genesee Avenue to La Jolla Village Drive

Characteristics – planted prior to military occupancy, native to Australia and New Zealand

Examples – Eucalyptus (*Eucalyptus caldocalyx*, *E. sideroxylon*, *E. polyanthemos*, Bergen, 1999)

U.C. San Diego Campus (Nonnative Grasslands)

Elevation – 50-400 feet (15-120 meters) (UCSD-CPOa., 1989)

Annual Precipitation – 10 inches (25 cm.) (Elford & Stilz, 1970)

Areas within UCSD campus – ridges and mesa tops

Characteristics – resulting from past brushing, grading, and agricultural activities

Examples – Foxtail (*Setaria glauca*) (Bergen, 1999)

U.C. San Diego Campus (Landscaped Areas)

Elevation – 50-400 feet (15-120 meters) (UCSD-CPOa., 1989)

Annual Precipitation – 10 inches (25 cm.) (Elford & Stilz, 1970)

Areas within UCSD campus – developed areas

Characteristics – exotics commonly used in landscaping

Examples – exotic tree and shrub species

APPENDIX C FAUNA OF SAN DIEGO COUNTY'S MOUNTAIN ENVIRONMENT
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(unless otherwise noted, the following information is from USDA)

Table 1
BIRDS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Turkey Vulture	<i>(Cathartes atratus)</i>
White-tailed Kite	<i>(Elanus leucurus)</i>
Osprey	<i>(Pandion lakiaetus)</i>
Bald Eagle	<i>(Haliaeetus leucocephalus)</i>
Golden Eagle	<i>(Aquila chrysaetos)</i>
Northern Harrier	<i>(Circus cyaneus)</i>
Sharp-shinned Hawk	<i>(Accipiter striatus)</i>
Cooper's Hawk	<i>(Accipiter cooperii)</i>
Red-shouldered Hawk	<i>(Buteo lineatus)</i>
Red-tailed Hawk	<i>(Buteo jamaicensis)</i>
Swainson's Hawk	<i>(Buteo swainsoni)</i>
Ferruginous Hawk	<i>(Buteo regalis)</i>
Zone-tailed Hawk	<i>(Buteo albonotatus)</i>
Rough-legged Hawk	<i>(Buteo lagopus)</i>
American Kestrel	<i>(Falco sparverius)</i>
Merlin	<i>(Falco columbarius)</i>
Prairie Falcon	<i>(Falco mexicanus)</i>
Ring-necked Pheasant	<i>(Phasianus colchicus)</i>
Wild Turkey	<i>(Meleagris gallopavo)</i>
California Quail	<i>(Callipepla californica)</i>
Mountain Quail	<i>(Oreortyx pictus)</i>
Band-tailed Pigeon	<i>(Columba fasciata)</i>
Mourning Dove	<i>(Zenaida macroura)</i>
Rock Dove	<i>(Columba livia)</i>
Yellow-billed Cuckoo	<i>(Coccyzus americanus)</i>
Greater Roadrunner	<i>(Geococcyx californianus)</i>
Barn Owl	<i>(Tyto alba)</i>
Flammulated Owl	<i>(Otus flammeolus)</i>
Western-Screech Owl	<i>(Otus kennicottii)</i>
Northern Pygmy Owl	<i>(Glaucidium gnoma)</i>
California Spotted Owl	<i>(Strix occidentalis)</i>
Long-eared Owl	<i>(Asio otus)</i>
Short-eared Owl	<i>(Asio flammeus)</i>
Northern Saw-whet Owl	<i>(Aegolius acadicus)</i>
Common Poor-will	<i>(Plalaenoptilus nuttallii)</i>
Lesser Nighthawk	<i>(Chordeiles acutipennis)</i>

Table 1 (continued)
BIRDS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Black Swift	<i>(Cypseloides niger)</i>
Vaux's Swift	<i>(Chaetura vauxi)</i>
White-throated Swift	<i>(Aeronautes saxatalis)</i>
Black-chinned Hummingbird	<i>(Archilochus alexandri)</i>
Anna's Hummingbird	<i>(Calypte anna)</i>
Costa's Hummingbird	<i>(Calypte costae)</i>
Calliope Hummingbird	<i>(Stellula calliope)</i>
Rufous Hummingbird	<i>(Selasphorus rufus)</i>
Allen's Hummingbird	<i>(Selasphorus sasin)</i>
Lewis' Woodpecker	<i>(Melanerpes lewis)</i>
Acorn Woodpecker	<i>(Melanerpes formicivorus)</i>
Red-naped Sapsucker	<i>(Sphyrapicus nuchalis)</i>
Red-breasted Sapsucker	<i>(Sphyrapicus ruber)</i>
Yellow-bellied Sapsucker	<i>(Sphyrapicus varius)</i>
Williamson's Sapsucker	<i>(Sphyrapicus thyroideus)</i>
Nuttall's Woodpecker	<i>(Picoides nuttallii)</i>
Downy Woodpecker	<i>(Picoides pubescens)</i>
Hairy Woodpecker	<i>(Picoides villosus)</i>
White-headed Woodpecker	<i>(Picoides albolarvatus)</i>
Northern Flicker	<i>(Colaptes auratus)</i>
Olive-sided Flycatcher	<i>(Contopus borealis)</i>
Western Wood Pewee	<i>(Contopus sordidulus)</i>
Southwestern Willow Flycatcher	<i>(Empidonax traillii)</i>
Hammond's Flycatcher	<i>(Empidonax hammondii)</i>
Dusky Flycatcher	<i>(Empidonax oberholseri)</i>
Pacific Slope Flycatcher	<i>(Empidonax difficilis)</i>
Gray Flycatcher	<i>(Empidonax wrightii)</i>
Black Phoebe	<i>(Sayornis nigricans)</i>
Say's Phoebe	<i>(Sayornis saya)</i>
Eastern Phoebe	<i>(Sayornis phoebe)</i>
Ash-throated Flycatcher	<i>(Myiarchus cinerascens)</i>
Western Kingbird	<i>(Tyrannus verticalis)</i>
Cassin's Kingbird	<i>(Tyrannus vociferans)</i>
Violet-green Swallow	<i>(Tachycineta thalassina)</i>
Tree Swallow	<i>(Tachycineta bicolor)</i>
Northern Rough-winged Swallow	<i>(Stelgidopteryx serripennis)</i>
Barn Swallow	<i>(Hirundo rustica)</i>
Cliff Swallow	<i>(Hirundo pyrrhonota)</i>
Purple Martin	<i>(Progne subis)</i>
Stellar's Jay	<i>(Cyanocitta stellari)</i>
Scrub Jay	<i>(Aphelocoma californica)</i>

Table 1 (continued)
BIRDS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Pinyon Jay	<i>(Gymnorhinus cyanocephalus)</i>
Clark's Nutcracker	<i>(Nucifraga columbiana)</i>
Common Raven	<i>(Corvus corax)</i>
American Crow	<i>(Corvus brachyrhynchos)</i>
Mountain Chickadee	<i>(Parus gambeli)</i>
Plain Titmouse	<i>(Parus inornatus)</i>
Bushtit	<i>(Psaltriparus minimus)</i>
White-breasted Nuthatch	<i>(Sitta carolinensis)</i>
Red-breasted Nuthatch	<i>(Sitta canadensis)</i>
Pygmy Nuthatch	<i>(Sitta pygmaea)</i>
Brown Creeper	<i>(Certhia americana)</i>
Rock Wren	<i>(Salpinctes obsoletus)</i>
Canyon Wren	<i>(Catherpes mexicanus)</i>
Bewicks Wren	<i>(Thryomanes bewickii)</i>
House Wren	<i>(Troglodytes aedon)</i>
Cactus Wren	<i>(Campylorhynchus brunneicapillus)</i>
Marsh Wren	<i>(Cistothorus palustris)</i>
Winter Wren	<i>(Troglodytes troglodytes)</i>
Golden-crowned Kinglet	<i>(Regulus satrapa)</i>
Ruby-crowned Kinglet	<i>(Regulus calendula)</i>
Blue-gray Gnatcatcher	<i>(Polioptila caerulea)</i>
California Gnatcatcher	<i>(Polioptila californica)</i>
Western Bluebird	<i>(Sialia mexicana)</i>
Mountain Bluebird	<i>(Sialia currocoides)</i>
Townsend's Solitaire	<i>(Myadestes townsendi)</i>
Varied Thrush	<i>(Ixoreus naevius)</i>
Swainson's Thrush	<i>(Catharus ustulatus)</i>
Hermit Thrush	<i>(Catharus guttatus)</i>
American Robin	<i>(Turdus swalesi)</i>
Wrentit	<i>(Chamaea fasciata)</i>
Northern Mockingbird	<i>(Mimus polyglottos)</i>
California Thrasher	<i>(Toxostoma redivivum)</i>
Sage Thrasher	<i>(Oreoscoptes montanus)</i>
Cedar Waxwing	<i>(Bombycilla cedrorum)</i>
Phainopepla	<i>(Phainopepla nitens)</i>
Loggerhead Shrike	<i>(Lanius ludovicianus)</i>
European Starling	<i>(Sturnus vulgaris)</i>
Least Bell's Vireo	<i>(Vireo belli pusillusi)</i>
Gray Vireo	<i>(Vireo vicinior)</i>
Solitary Vireo	<i>(Vireo solitarius)</i>
Warbling Vireo	<i>(Vireo gilvus)</i>

Table 1 (continued)
BIRDS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Hutton's Vireo	<i>(Vireo huttoni)</i>
Orange-crowned Warbler	<i>(Vermivora celata)</i>
Nashville Warbler	<i>(Vermivora reficapilla)</i>
Yellow Warbler	<i>(Dendroica petechia)</i>
Yellow-rumped Warbler (Audubon's-Myrtle)	<i>(Dendroica coronata)</i>
Black-throated Gray Warbler	<i>(Dendroica nigrescens)</i>
Townsend's Warbler	<i>(Dendroica townsendi)</i>
Hermit Warbler	<i>(Dendroica occidentalis)</i>
MacGillivray's Warbler	<i>(Oporornis tolmiei)</i>
Magnolia Warbler	<i>(Dendroica magnolia)</i>
Common Yellowthroat	<i>(Geothlypis trichas)</i>
Wilson's Warbler	<i>(Wilsonia pusilla)</i>
Yellow-breasted Chat	<i>(Icteria virens)</i>
Summer Tanager	<i>(Piranga rubra)</i>
Western Tanager	<i>(Piranga ludoviciana)</i>
Blue Grosbeak	<i>(Guiraca caerulea)</i>
Black-headed Grosbeak	<i>(Pheucticus melanocephalus)</i>
Rose-breasted Grosbeak	<i>(Pheucticus ludovicianus)</i>
Evening Grosbeak	<i>(Coccothraustes vespertinus)</i>
Lazuli Bunting	<i>(Passerina amoena)</i>
Indigo Bunting	<i>(Passerina cyanea)</i>
Purple Finch	<i>(Carpodacus purpureus)</i>
Cassin's Finch	<i>(Carpodacus cassinii)</i>
House Finch	<i>(Carpodacus mexicanus)</i>
Pine Siskin	<i>(Carduelis pinus)</i>
Red Crossbill	<i>(Loxia curvirostra)</i>
American Goldfinch	<i>(Carduelis eristis)</i>
Lesser Goldfinch	<i>(Carduelis psattria)</i>
Lawrence's Goldfinch	<i>(Carduelis lawrencei)</i>
Rufous-sided Towhee	<i>(Pipilo erythrophthalmus)</i>
California Towhee	<i>(Pipilo crissalis)</i>
Green-tailed Towhee	<i>(Pipilo chlorurus)</i>
Lark Bunting	<i>(Calamospiza melanocorys)</i>
Savannah Sparrow	<i>(Passerculus sandwichensis)</i>
Grasshopper Sparrow	<i>(Ammodramus savannarum)</i>
Vesper Sparrow	<i>(Pooecetes gramineus)</i>
Lark Sparrow	<i>(Chondestes grammacus)</i>
Rufous-crowned Sparrow	<i>(Aimophila ruficeps)</i>
Sage Sparrow	<i>(Amphispiza belli)</i>
Chipping Sparrow	<i>(Spizella passerina)</i>

Table 1 (continued)
BIRDS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Black-chinned Sparrow	<i>(Spizella atrogularis)</i>
White-crowned Sparrow	<i>(Zonotrichia leucophrys)</i>
Golden-crowned Sparrow	<i>(Zonotrichia atricapilla)</i>
Fox Sparrow	<i>(Passerella iliaca)</i>
Lincoln's Sparrow	<i>(Melospiza lincolnii)</i>
Song Sparrow	<i>(Melospiza melodia)</i>
Brewer's Sparrow	<i>(Spizella breweri)</i>
White-throated Sparrow	<i>(Zonotrichia albicollis)</i>
Dark-eyed Junco	<i>(Junco hyemalis)</i>
Western Meadowlark	<i>(Sturnella neglecta)</i>
Red-winged Blackbird	<i>(Agelaius phoeniceus)</i>
Tri-colored Blackbird	<i>(Agelaius tricolor)</i>
Yellow-headed Blackbird	<i>(Xanthocephalus xanthocephalus)</i>
Brewer's Blackbird	<i>(Euphagus cyanocephalus)</i>
Brown-headed Cowbird	<i>(Molothrus ater)</i>
Northern Oriole	<i>(Icterus bullockii)</i>
Scott's Oriole	<i>(Icterus parisorum)</i>
Hooded Oriole	<i>(Icterus cucullatus)</i>
House Sparrow	<i>(Passer domesticus)</i>

Table 2 (Jameson & Peeters, 1988)
MAMMALS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Desert Shrew	<i>(Notiosorex crawfordi)</i>
Broad-footed Mole	<i>(Scapanus latimanus)</i>
Spotted Bat	<i>(Euderma maculatum)</i>
Ringtail	<i>(Bassariscus astutus)</i>
Raccoon	<i>(Procyon lotor)</i>
Striped Skunk	<i>(Mephitis mephitis)</i>
Long-tailed Weasel	<i>(Mustela frenata)</i>
Mountain Lion	<i>(Felis concolor)</i>
Bobcat	<i>(Lynx rufus)</i>
Gray Fox	<i>(Urocyon cinereoargenteus)</i>
Mule Deer	<i>(Odocoileus hemionus)</i>
California Ground Squirrel	<i>(Spermophilus beecheyi)</i>
Western Gray Squirrel	<i>(Sciurus griseus)</i>
Botta's Pocket Gopher	<i>(Thomomys bottae)</i>
Pacific Kangaroo Rat	<i>(Dipodomys agilis)</i>
California Pocket Mouse	<i>(Perognathus californicus)</i>
San Diego Pocket Mouse	<i>(Perognathus fallax)</i>

Table 2 (continued)

MAMMALS IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
Dusky-footed Wood Rat	<i>(Neotoma fuscipes)</i>
Brush Mouse	<i>(Peromyscus boylii)</i>
Parasitic Mouse	<i>(Peromyscus californicus)</i>
Deer Mouse	<i>(Peromyscus maniculatus)</i>
Pinon Mouse	<i>(Peromyscus truei)</i>
California Meadow Vole	<i>(Microtus californicus)</i>
Brown/Norway Rat	<i>(Rattus norvegicus)</i>
Porcupine	<i>(Erethizon dorsatum)</i>
Audubon's Cottontail Rabbit	<i>(Sylvilagus audubonii)</i>
Domestic/Feral House Cat (personal observation)	<i>(Felis catus domesticus)</i>
Domestic Dog (personal observation)	<i>(Canis canis)</i>

Table 3

REPTILES IDENTIFIED IN THE CLEVELAND NATIONAL FOREST

Common Name	Latin Name
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-not specified-

APPENDIX D FAUNA OF UC SAN DIEGO'S CAMPUS ENVIRONMENT
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Table 4 (RECON, 1989)
BIRDS IDENTIFIED ON THE UC SAN DIEGO CAMPUS

Common Name	Latin Name
American Kestrel	<i>(Falco sparverius)</i>
Anna's Hummingbird	<i>(Calypte anna)</i>
Ash-throated Flycatcher	<i>(Myiarchus cinerascens)</i>
Bewick's Wren	<i>(Thryomans bewickii)</i>
Black Phoebe	<i>(Sayornis nigricans)</i>
Brown Towhee	<i>(Pipilo fuscus)</i>
Burrowing Owl	<i>(Athene cunicularia)</i>
Bushtit	<i>(Psaltriparus minimus)</i>
California Black-tailed Gnatcatcher	<i>(Polioptila (melanura) californica)</i>
California Quail	<i>(Callipepla californica)</i>
California Thrasher	<i>(Toxostoma redivivum)</i>
Cassin's Kingbird	<i>(Tyrannus vociferans)</i>
Cliff Swallow	<i>(Hirundo pyrrhonota)</i>
Common Flicker	<i>(Colaptes auratus)</i>
Common Crow	<i>(Corvus brachyrhynchos)</i>
Common Raven	<i>(Corvus corax)</i>
Common Yellowthroat	<i>(Geothlypis trichas)</i>
Dark-eyed Junco	<i>(Junco hyemalis)</i>
European Starling	<i>(Sturnus vulgaris)</i>
Great Homed Owl	<i>(Bubo virginianus)</i>
Golden-crowned Sparrow	<i>(Zonotrichia atricapilla)</i>
Hermit Thrush	<i>(Hylocichla guttata)</i>
House, Finch	<i>(Carpodacus mexicanus)</i>
House Wren	<i>(Troglodytes aedon)</i>
Hutton's Vireo	<i>(Vireo huttoni)</i>
Killdeer	<i>(Charadrius vociferus)</i>
Lesser Goldfinch	<i>(Carduelis psaltria)</i>
Loggerhead Shrike	<i>(Lanius ludovicianus)</i>
Mourning Dove	<i>(Zenaida macroura)</i>
Northern Harrier	<i>(Circus cyaneus)</i>
Northern Mockingbird	<i>(Mimus polyglottos)</i>
Nuttall's Woodpecker	<i>(Picoides nuttallii)</i>
Orange-crowned Warbler	<i>(Vermivora celata)</i>
Red-shouldered Hawk	<i>(Buteo lineatus)</i>
Red-tailed Hawk	<i>(Buteo jamaicensis)</i>
Ring-billed Gull	<i>(Larus delawarensis)</i>
Rock Dove	<i>(Columba livia)</i>
Rock Wren	<i>(Salpinctes obsoletus)</i>
Rufous-sided Towhee	<i>(Pipilo erythrophthalmus)</i>

Table 4 (continued)
BIRDS IDENTIFIED ON THE UC SAN DIEGO CAMPUS

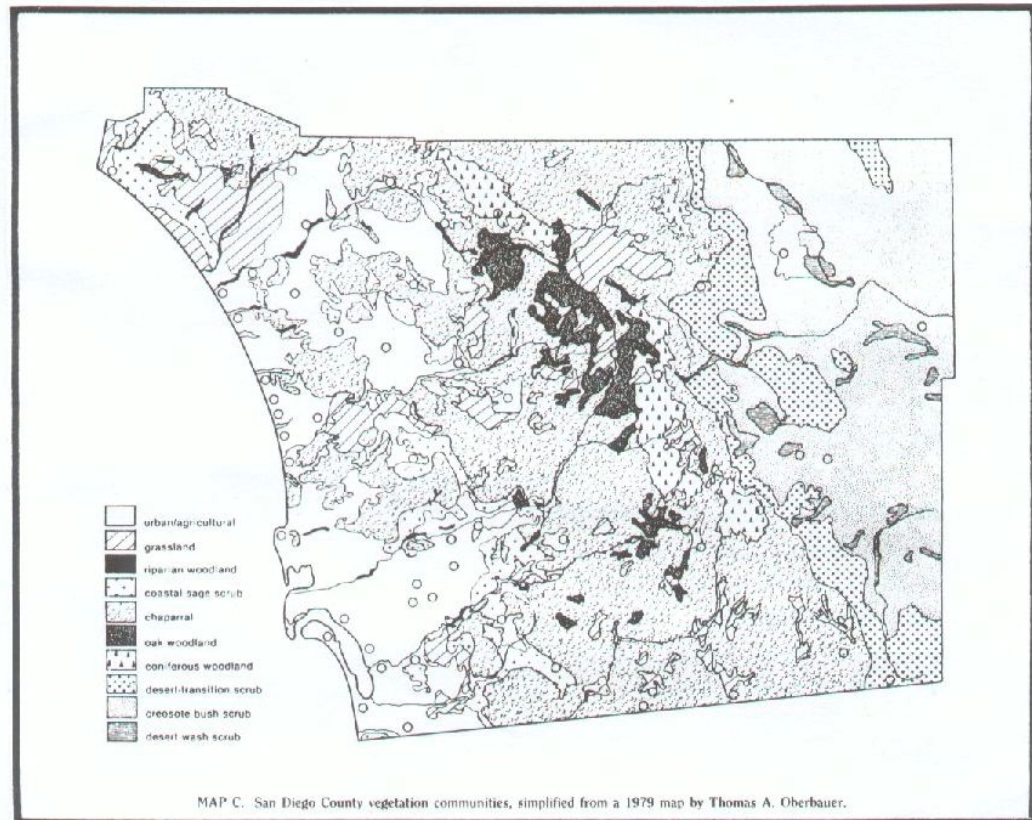
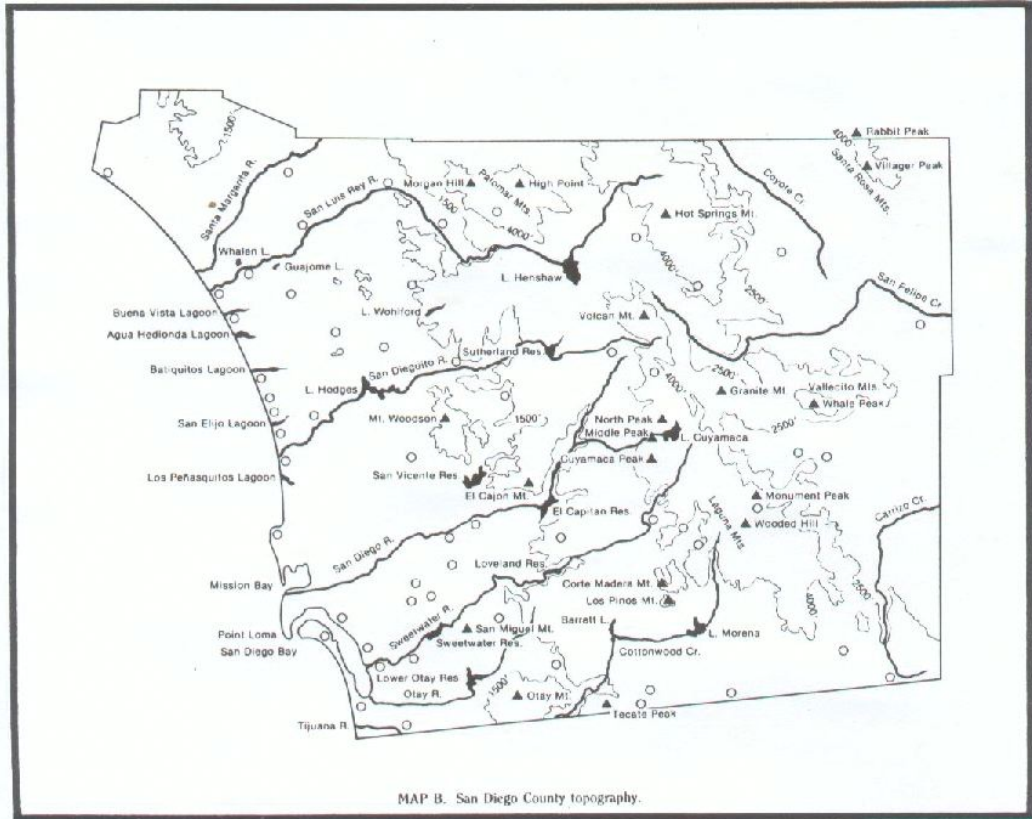
Common Name	Latin Name
Rufous-crowned Sparrow	<i>(Aimophila ruficeps)</i>
Savannah Sparrow	<i>(Passerculus savannarum)</i>
Say's Phoebe	<i>(Sayornis saya)</i>
Scrub Jay	<i>(Aphelocoma coerulescens)</i>
Song Sparrow	<i>(Melospiza melodia)</i>
Western Meadowlark	<i>(Sturnella neglecta)</i>
White-crowned Sparrow	<i>(Zonotrichia leucophrys)</i>
White Pelican	<i>(Pelecanus erythrorhynchos)</i>
Willet	<i>(Catoptrophorus semipalmatus)</i>
Wrentit	<i>(Chamaea fasciata)</i>
Yellow-rumped Warbler	<i>(Dendroica coronata)</i>

Table 5 (Recon, 1989)
MAMMALS IDENTIFIED ON THE UC SAN DIEGO CAMPUS

Common Name	Latin Name
Coyote	<i>(Canis latrans)</i>
Bobcat	<i>(Felis rufus)</i>
Striped <i>Skunk</i>	<i>(Mephitis mephitis)</i>
House Mouse	<i>(Mus musculus)</i>
Woodrat	<i>(Neotoma sp.)</i>
Mule Deer	<i>(Odocoileus hemionus)</i>
White-footed Mouse	<i>(Peromyscus sp.)</i>
California Ground Squirrel	<i>(Spermophilus beecheyi)</i>
Cottontail Rabbit	<i>(Sylvilagus sp.)</i>
Valley Pocket Gopher	<i>(Thomomys bottae)</i>
Gray Fox	<i>(Urocyon cinereoargenteus).</i>
Opossum (personal observation)	<i>(Didelphis virginiana)</i>
Domestic/Feral House Cat (personal obervation)	<i>(Felis catus domesticus)</i>
Domestic Dog (personal observation)	<i>(Canis canis)</i>

Table 6 (RECON, 1989)
REPTILES IDENTIFIED ON THE UC SAN DIEGO CAMPUS

Common Name	Latin Name
Red Diamond Rattlesnake	<i>(Crotalus ruber)</i>
Southern Alligator Lizard	<i>(Gerrhonotus multicarinatus)</i>
Gopher Snake	<i>(Pituophis melanoleucus)</i>
Western Fence Lizard	<i>(Sceloporus occidentalis)</i>
Side-blotched Lizard	<i>(Uta stansburiana)</i>



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