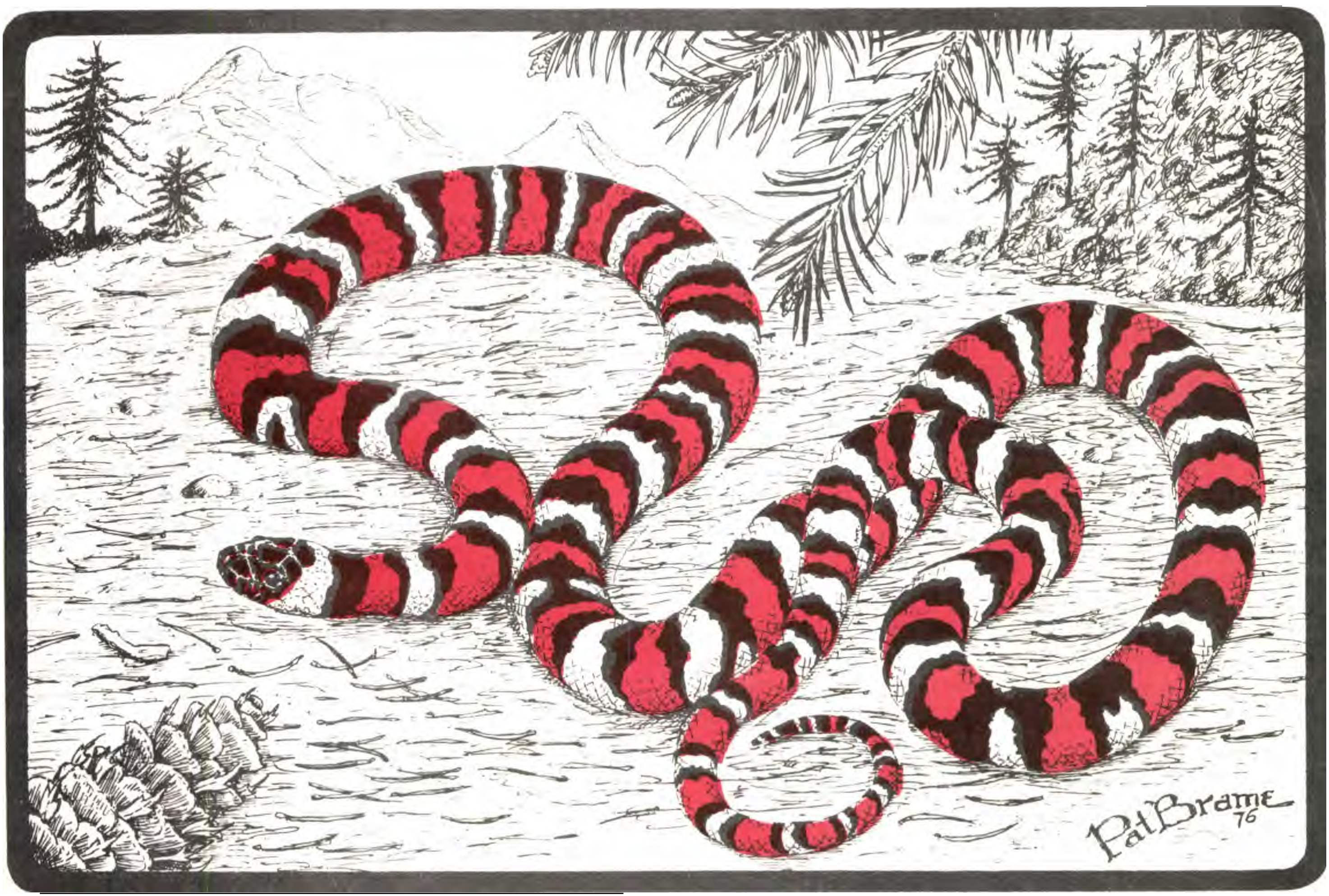
The Herpetofauna of the San Gabriel Mountains

Los Angeles County, California

Including Distribution and Biogeography



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Including Distribution and Biogeography

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THE HERPETOFAUNA OF THE SAN GABRIEL MOUNTAINS, LOS ANGELES COUNTY, CALIFORNIA

ABSTRACT

The herpetofauna of the San Gabriel Mountains is comprised of a diverse group of amphibians and reptiles limited in geographic distribution by the interaction of ecological factors including soil type, precipitation, temperature, and vegetation. A strong relationship exists between the distribution of the major vegetation types and the herpetofauna. The vegetation types are divided into nine plant communities, (1) coastal sage scrub, (2) California chaparral, (3) yellow pine forest, (4) sagebrush scrub, (5) pinyon pine woodland, (6) juniper woodland, (7) Joshua tree woodland, (8) southern oak woodland, and (9) riparian woodland.

Each of the nine plant communities is associated with a distinctive herpetofauna. Based on evapotranspiration data, chaparral is ecologically the intermediate plant community and has the largest and most diverse herpetofauna. Joshua tree woodland and riparian woodland, ecologically the two extreme plant communities, have the most restricted herpetofauna. Certain physiographic factors such as steep slopes and rapid runoff have contributed to the absence of significant flatland habitats. The absence of these habitats contributes to rarity or absence of a number of amphibians and reptiles present in adjacent mountain ranges.

The origin of the San Gabriel Mountain herpetofauna may be correlated with the history of the Arcto-Tertiary and Madro-Tertiary geofloras. The group of Arcto-Tertiary relationships consists entirely of amphibious forms; salamanders, frogs, toads, and one turtle. The group of Arcto-Tertiary relationships may further be divided into four subgroups on the basis of migratory pathways; (1) Coast Range immigrants, (2) immigrants with ancestors in southern California prior to the San Joaquin embayment, (3) immigrants from both the Coast Range and the Sierra Nevada, and (4) forms introduced by man. The group of Madro-Tertiary relationships consists primarily of lizards and snakes but includes also a few frogs and toads. This group also may be divided into four subgroups on the basis of migratory pathways; (1) immigrants *via* northern pathways, (2) southern chaparral corridor immigrants, (3) desert immigrants, and (4) immigrants from both the desert and the chaparral corridor.

TABLE OF CONTENTS

INTRODUCTION

The San Gabriel Mountains north of Los Angeles comprise one of the transverse ranges of southern California rising abruptly to form part of the northern boundary of the Los Angeles Basin. Biogeography of this region is of particular interest because these mountains lie at the juncture of three mountain systems, the Coast Range and Sierra Nevada of the north and peninsular ranges that extend south into Baja California, Mexico. Previous faunal studies have been essentially lists with little concern for ecological or distributional phenomena. Grinnell and Grinnell (1907) published a check-list of the reptiles of Los Angeles County, Bogert (1930) and Dixon (1967) published similar accounts that included amphibians, and Vaughn (1954) related mammals to plant communities. This paper relates the herpetofauna to plant communities, ranks the communities according to evapotranspiration data, and discusses past and present distributional patterns with respect to ecological limiting factors.

METHODS AND MATERIALS

In an attempt to determine the factors responsible for the present herpetofaunal distribution patterns a large number of locality records were amassed, each of which was analyzed as thoroughly as possible with respect to plant communities, elevation, soil type, temperature, and rainfall. Long term temperature and rainfall data were obtained from the climatic summary published by the United States Department of Commerce (1952). Published locality records were relied upon for many records and actual collections were searched whenever possible. The bulk of the locality records were obtained by actual field work. A National Science Foundation Fellowship enabled me to spend a great deal of time in the field during the summer of 1959 at which time a total of 242 field stations were established. Other studies of this type that have been conducted in the past were based for the most part on a sample habitat basis. Under the sample habitat method, five or so field stations are selected, each of which is located in a different type of habitat and extensive collections are made at each of the localities. This sample habitat technique is not always adequate. In my experience the best results are obtained from collecting in as many localities as possible, so long as no habitat type is overlooked. This latter technique is more time consuming, but in order to obtain a comprehensive picture of the entire range it is essential.

Each of the locality records was placed on a range map. The localities were then analyzed with respect to ecological data. Locality lists are located at the end of each species account. Locality maps are located at the end of the species account section.

Collection techniques vary with season and type of animal desired. The best technique for collecting amphibians was found to be by driving slowly along the roads at night in much the same manner as one would collect desert snakes. However, when collecting amphibians, one drives only while it is raining. This technique of collecting is particularly valuable in southern California where the rainfall is intermittent because every good rain brings the amphibians into activity and it enables the collector to investigate several plant communities and collect a considerable number of specimens over a large area in the matter of a few hours.

Collection techniques for reptiles are quite variable. Turtles, which are not abundant in the San Gabriels, are best collected with a

net as they are encountered. Two methods have proved satisfactory for lizards. If the specimens are to be taken alive, the use of a snare on the end of a long, thin stick has proven to be quite adequate. If it is not desirable to collect the specimens alive or if the specimens are out of reach of the snare, the best techniaue has been to shoot them with a special .22 caliber load of number twelve shot. This ligh load of shot serves to kill or stun the animal, and causes only minimal damage to the specimen. Snakes are also most easily collected by this shooting method. The shooting technique is especially valuable in the collection of racers that are normally able to escape with ease if any cover is nearby. Collecting by automobile at night is much mor **productive** on the desert slope. The night driving technique produces very little more than *Crotalus viridis* on the Pacific slope. However, driving the roads at dusk or dawn has proven more productive on the Pacific slope, at which time a number of snake species may be collecte

PHYSIOGRAPHY

The San Gabriel Range is approximately 102 kilometers long and averages 32 kilometers wide at its base. The western boundary is San Fernando Pass (old Fremont Pass) through which passes State Highway 14 to and from Los Angeles. State Highway 14 follows the boundary of the mountains to the Santa Clara River which drains Soledad Canyon and marks the northwestern border of the range. The northern slope gradually passes to the floor of the Mojave Desert at about 1100 meters above sea level. To the east, the San Gabriels are separated from the San Bernardino Mountains by Cajon Canyon through which passes State Highway 138 and U. S. Highway 395 to and from the city of San Bernardino. Alluvial slopes at the southern base of the mountains extend to approximately 350 meters elevation. The range lies approximately 40 kilometers from the Pacific Ocean and the drainage-divide ranges from 2000 to 3000 meters, rising to 3066 meters on San Antonio Mountain (Mount Baldy).

CLIMATE

The San Gabriel Range provides a substantial barrier to inland movement of Pacific air masses, a factor creating **quite** different climatic situations on the coastal and inland slopes. In summer, the desert (northern) slope averages approximately 3°C warmer than the Pacific (southern) slope. In winter, however, the desert slope averages approximately 6°C cooler. At the mouth of San Antonio Canyon, in the upper coastal sage scrub on the south side of the range, temperatures average 20.0°C in June and 12.5°C in December. As might be expected, temperatures are lower at higher elevations on both slopes. Because of the east to west orientation of the range an interesting condition occurs at elevations above 2000 meters where insolation from the sun's southerly position tends to maintain higher temperatures on the Pacific slope throughout the year; desert slope temperatures at this elevation average about 3°C **cooler** than on the southern versant. Average temperatures for Table Mountain at 2500 meters on the desert slope are 15.4°C in June and 2.3°C in December.

The coastal slope averages approximately 500 mm more annual precipitation than does the desert slope. The mouth of San Antonio Canyon has an average of 689.2 mm per year and Llano has an average of 185.5 mm. Most precipitation falls in winter in a typical Mediterranean pattern. There are a few intermittent summer showers, particularly at higher elevations. Humidity is consistently greater

on the coastal slope. In spring, thick morning fogs frequently blanket lower elevations of the coastal slope, but seldom reach the desert slope. At elevations higher than 1600 meters, much precipitation is in the form of snow. Table Mountain has an average annual precipitation of 3761.0 mm, averaging 2474.0 mm of snow. Precipitation rarely occurs in autumn. This dryness, coupled with high temperatures and frequent, dry, "Santa Ana" winds, creates conditions of high fire hazard. Chaparral fires are common in September and October.

ECOLOGICAL LIMITING FACTORS

Five principal ecologic factors affect the distribution of the herpetofauna. Temperature and precipitation are of particular importance because they directly influence the other three factors - vegetation, soil type, and available food.

Holdridge (1947, 1962) has demonstrated that temperature and precipitation influence the type, size, and density of vegetation by controlling the rates of evapotranspiration of available moisture. Potential evapotranspiration (in mm) may be calculated by multiplying 58.93 times mean annual temperature (°C). Llano in the Joshua tree plant community shows a deficiency of 727.9 mm because potential evapotranspiration is 913.4 mm and mean annual precipitation is only 185.5 mm. **Holdridge** expressed this comparison as an evapotranspiration ratio, dividing the potential evapotranspiration by the mean annual precipitation. This ratio for Joshua tree woodland is 4.9. It is this deficiency of moisture that dictates the presence of a widely spaced, xerophytic vegetation type at **Llano.** At the other extreme, a tropical rainforest would show a surplus of moisture and drought adaptations would be characteristically lacking. The Holdridge evapotranspiration ratio may be used as an index of environmental severity useful in ranking plant communities on the basis of their suitability for habitation by animals.

In addition to evapotranspiration rate, certain climatic and edaphic factors influence the type of vegetation present in an area. For example, frequent winds increase the rate of evapotranspiration and also shape the vegetation. Two edaphic factors seem to be of primary importance, a water source other than precipitation, and the type of soil. An outside water source permits vegetation to develop that may be inconsistant with simple climatic data — subterranean water may allow development of an oak woodland, and riparian vegetation is restricted to the banks of a permanent stream, and both associations occur in zones where temperature and precipitation regimes are similar to chaparral. Soil type influences vegetation by its chemical composition and by the amount of water it can hold, and its depth controls the development of root systems.

Available moisture and soil type also may affect the **herpetofauna** by means other than through vegetation. Available free moisture influences distribution of small mammals that are preyed upon by snakes. Because of water requirements in the life histories of amphibians, their distributions are directly controlled by moisture. Prolonged aridity even may eliminate a normally permanent spring or stream and thereby destroy a riparian community. Soil type directly affects distribution of the herpetofauna by limiting activity of burrowing forms. Soils throughout the San Gabriels often are quite shallow, partly due to steep slopes. Except for regions of alluvial fill, soil depth is seldom over 15 cm. The pH of soils ranges from acid (pH 5.0) in yellow pine forest to alkaline (pH 8.0) in Joshua

tree woodland.

HERPETOFAUNA IN RELATION TO MAJOR PLANT COMMUNITIES

Due to the obvious importance of vegetation, distribution of the herpetofauna is logically discussed in relation to the distribution of major plant communities. Vegetation of the San Gabriels is divisible into nine plant communities. Eight were described by Munz and Keck (1959), and the additional type is the riparian plant community which was not considered an entity by Munz and Keck, but was described in detail by Benson (1957). Distribution of these plant communities is plotted in figures 1 and 2. Figure 5 is included as a map of key localities and locality records for each species of amphibian and reptile are plotted in figures 6 through 25.

Each plant community in the San Gabriels has a characteristic fauna. Joshua tree woodland is the most arid and the riparian plant community has the most available moisture. Joshua tree woodland with an evapotranspiration ratio of 4.9 shows a deficiency of 727.9 mm of moisture, and riparian woodland has a large surplus of water due to the permanent stream. Chaparral, with a calculated deficiency of 321.7 mm and an evapotransoiration ratio of 1.5 therefore is intermediate to the extremes. The species composition of the herpetofauna and indicator species for the flora of each community are given in Table 1.

1. California Chaparral

Due to its intermediate nature, no amphibians or reptiles are unique to the chaparral community and all members of its herpetofauna occur in one or more of the other communities. General lack of extreme climatic conditions and the dense cover provided by the vegetation make it an ideal habitat for many reptiles. The most abundant lizards of chaparral are western fence lizards, *Sceloporus occidentaZis* and side-blotched lizards, *Uta stansburiana. Uta* appears to outnumber *Sceloporus* only on very steep, cliff-like hillsides and other rocky areas of little vegetation. Uta is particularly abundant on almost-vertical road cuts. At some localities western whiptail lizards, *Cnemidophorus tigris,* outnumber both *Sceloporus* and *Uta.* The most abundant snake is the striped racer, *Masticophis lateralis.* Gopher snakes, *Pituophis melanoleucus* and western rattlesnakes, *Crotalus viridis* also are common.

Chaparral as a whole is too warm and arid for amphibians. However, Monterey salamanders, *Ensatina eschscholtzi* sometimes were collected in chaparral some distance from water. On three occasions, the salamanders were collected in July from nests of woodrats, *Neotoma fuscipes.* During rainstorms, both *Ensatina eschscholtzi* and the western toad, *Bufo boreas,* are common on roads in chaparral areas.

2. Coastal Sage Scrub

There are three distinct habitats in coastal sage scrub. One is the rocky, boulder-strewn wash, with little vegetation. *Uta stansburiana* is a common lizard in such situations. A second habitat is characterized by areas of sandy or gravelly soil that support a major portion of the plant cover, many places so thick that it is impossible for a man to pass through. Reptiles characteristic of dense brush are *Sceloporus occidentalis, Phrynosoma coronatum* (coast horned lizard), and *Salvadora hexalepis* (patch-nosed snake). The third habitat is areas of fine sandy soil characterized by open spaces in the form of

FIGURE I

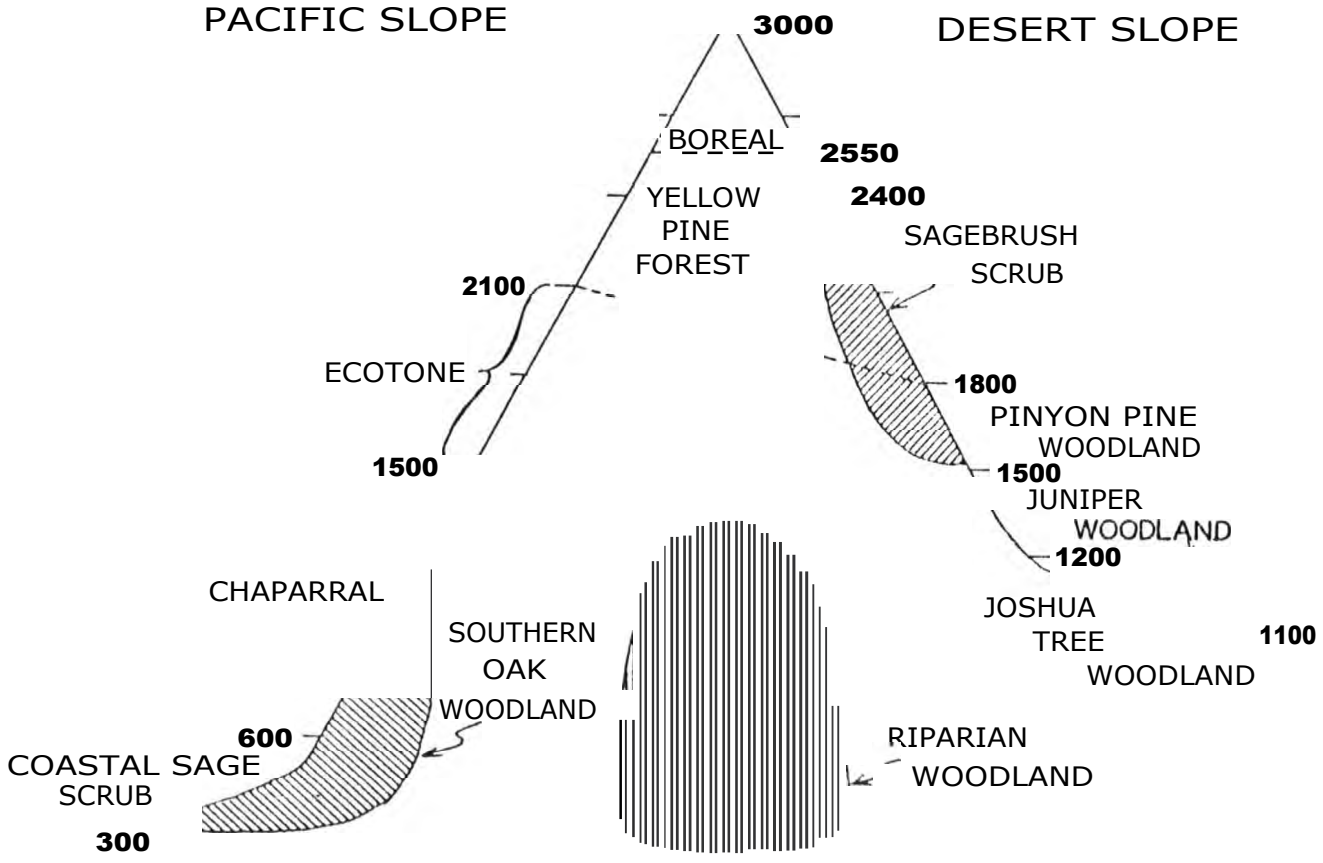


Figure 1 - Diagramatic representation of a cross section through the San Gabriel Mountain range showing relative positions of plant communities. Numbers indicate elevation in meters. Cross-hatching indicates discontinuous distribution of plant communities within indicated elevations. The riparian plant community is placed in the center of the figure to indicate that it occurs on both slopes.

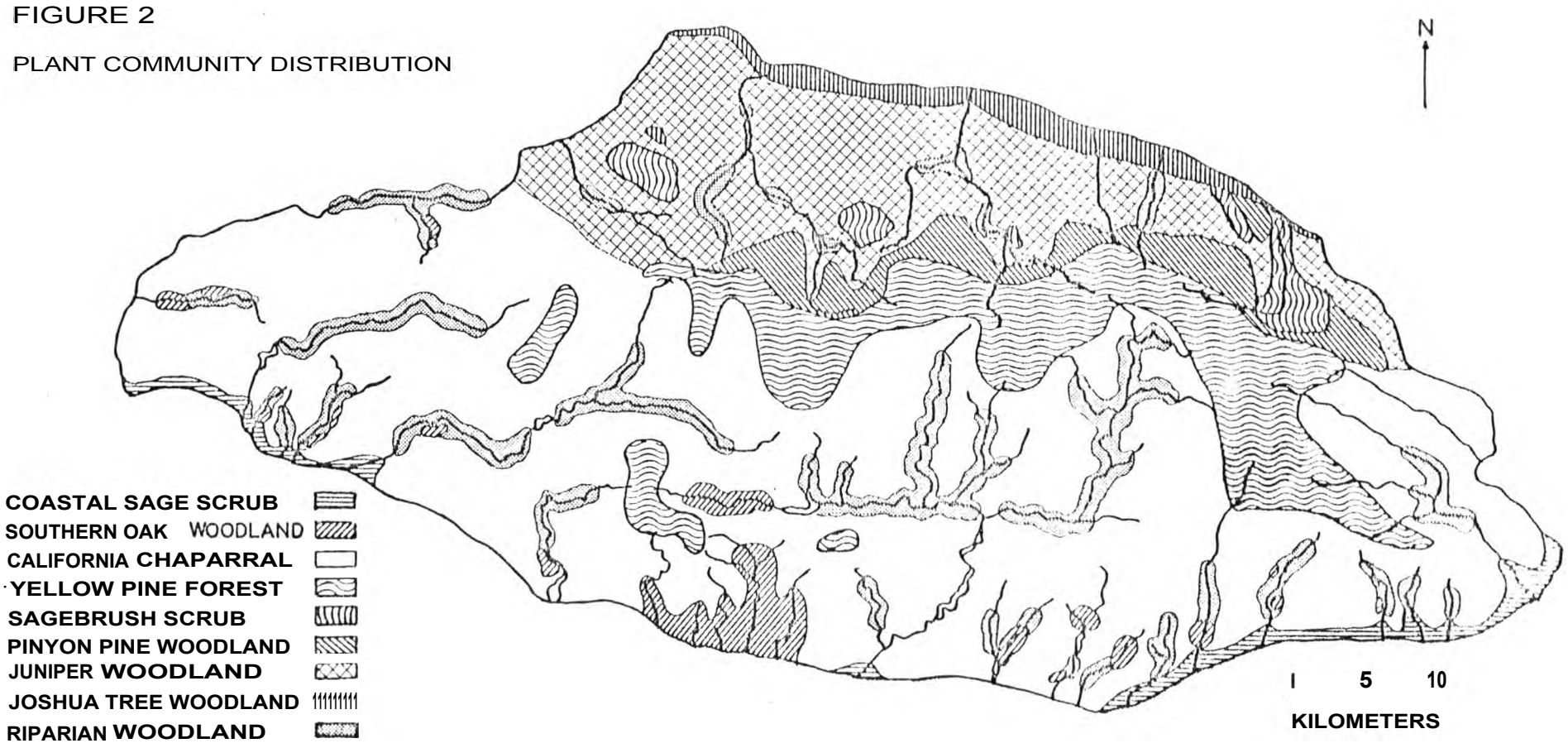


Figure 2 - Plant community distribution within the San Gabriel Mountains

Table 1 - Species Composition of the Herpetofauna and Indicator Plants for the Flora. Relative frequency of occurence indicated in parentheses as follows: Common (C), Occasional (0), and Rare (R).

Plant Community	Plant Indicators	Amphibians	Reptiles
California Chaparral	*Adenostoma fasciculatum* *Quercus dumosa* *Arctostaphylos glauca* *Yucca whipplei* *Pseudotsuga macrocarpa*	*Ensatina eschscholtzi (0)* *Bufo boreas (0)* *Hyla regilla (0)*	*Phrynosoma coronatum (0)* *Sceloporus occidentalis (C)* *Sceloporus graciosus (0)* *Uta stansburiana (C)* *Eumeces skiltonianus (0)* *Cnemidophorus tigris (C)* *Gerrhonotus multicarinatus (C)* *Leptotyphlops humilis (R)* *Lichanura trivirgata (0)* *Arizona elegans (R)* *Coluber constrictor (R)* *Masticophis lateralis (C)* *Hypsiglena torquata (0)* *Lampropeltis sonata (0)* *Lampropeltis getulus (0)* *Pituophis melanoleucus (C)* *Rhinocheilus lecontei (R)* *Salvadora hexalepis (0)* *Tantilla planiceps (R)* *Trimorphodon vandenburghi (R)* *Crotalus viridis (C)*
Coastal Sage Scrub	*Artemisia californica* *Salvia apiana* *Salvia mellifera* *Eriogonum fasciculatum* *Opuntia occidentalis*	*Scaphiopus hammondi (R)* *Bufo boreas (0)* *Bufo microscaphus (R)* *Hyla regilla (0)*	*Phrynosoma coronatum (0)* *Sceloporus occidentalis (C)* *Uta stansburiana (C)* *Cnemidophorus tigris (C)* *Anniella pulchra (0)* *Lichanura trivirgata (0)* *Arizona elegans (R)* *Lampropeltis getulus (0)* *Masticophis flagellum (R)* *Masticophis lateralis (C)* *Pituophis melanoleucus (C)* *Rhinocheilus lecontei (R)* *Salvadora hexalepis (0)* *Crotalus viridis (C)*

Table 1 - (Continued)

Plant Community	Plant Indicators	Amphibians	Reptiles
Yellow Pine Forest	*Pinus* ***ponderosa*** *Pinus jeffreyi* *Pinus* ***lambertiana*** *Abies* ***concolor*** ***Calocedrus decurrens*** *Quercus* ***kelloggii***	*Ensatina* ***eschscholtzi*** *(0)* *Bufo* ***boreas*** *(0)* *Hyla regilla (0)*	***Phrynosoma*** *coronatum (0)* ***Sceloporus graciosus*** *(C)* *Sceloporus occidentalis (0)* *Uta stansburiana (C)* *Eumeces skiltonianus (0)* *Gerrhonotus multicarinatus(C* ***Lampropeltis zonata*** *(C)* *Masticophis* ***lateralis*** *(C)* *Pituophis* ***melanoleucus*** *(C)* *Crotalus* ***viridis*** *(C)*
Sagebrush Scrub	*Artemisia tridentata* ***Purshia*** *glandulosa* *Chrysothamnus nauseosus* *Bromus* ***sp.***	*Bufo boreas (0)* *Hyla regilla (0)*	*Phrynosoma coronatum (0)* *Sceloporus graciosus (0)* *Sceloporus* ***occidentalis*** *(C)* *Uta* ***stansburiana*** *(C)* ***Masticophis lateralis*** *(C)* *Pituophis melanoleucus (C)* *Crotalus viridis (C)* ***Callisaurus*** *draconoides (R)*
Pinyon Pine Woodland	*Pinus monophylla*	*Bufo boreas (0)* *Hyla regilla (0)*	***Phrynosoma*** *coronatum (0)* *Sceloporus* ***occidentalis*** *(C)* *Uta* ***stansburiana*** *(C)* *Callisaurus draconoides (R)* ***Cnemidophorus*** *tigris (C)* ***Masticophis lateralis*** *(C)* ***Pituophis*** *melanoleucus (C)* *Crotalus viridis (C)*

Table 1 - (Continued)

Plant Community	Plant Indicators	Amphibians	Reptiles
Juniper Woodland	*Juniperus californica*	*Scaphiopus hammondi (R)* *Bufo boreas (0)* *Hyla regilla (0)*	*Sceloporus **occidentalis** (C)* *Uta **stansburiana** (C)* *Phrynosoma coronatum (0)* *Callisaurus draconoides (0)* *Crotaphytus wislizenii (0)* *Xantusia vigilis (0)* *Cnemidophorus tigris (C)* *Arizona **elegans** (0)* *Hypsiglena torquata (R)* *Masticophis flagellum (0)* *Masticophis lateralis (0)* *Pituophis melanoleucus (C)* *Rhinocheilus lecontei (R)* *Salvadora hexalepis (0)* *Crotalus **viridis** (C)*
Joshua Tree Woodland	*Yucca brevifolia*	*Bufo boreas (0)* *Hyla regilla (0)*	*Coleonyx variegatus (0)* *Phrynosoma coronatum (0)* *Callisaurus draconoides (0)* *Sceloporus **occidentalis** (0)* *Sceloporus magister (C)* *Uta **stansburiana** (C)* *Xantusia vigilis (C)* *Cnemidophorus tigris (C)* *Arizona elegans (0)* *Masticophis flagellum (0)* *Pituophis melanoleucus (C)* *Trimorphodon vandenburghi (R)?* *Crotalus cerastes (0)* *Crotalus scutulatus (0)* *Crotalus viridis (0)*

Table 1 - (Continued)

Plant Community	Plant Indicators	Amphibians	Reptiles
Riparian Woodland	***Platanus*** *racemosa* ***Alnus*** *rhombifolia* *Salix sp.*	*Ensatina eschscholtzi (0)* *Batrachoseps attenuatus (C)* *Taricha* ***torosa*** *(C)* *Bufo boreas (C)* *Bufo* ***microscaphus*** *(R)* *Hyla regilla (C)* *Hyla cadaverina (C)* *Rana catesbeiana (0)* *Rana aurora (0)* *Rana muscosa (C)* *Rana boylei (0)*	*Clemmys marmorata (0)* *Sceloporus occidentalis (C)* *Uta stansburiana (C)* *Crotaphytus collaris (0)* *Eumeces skiltonianus (0)* *Eumeces gilberti (R)* *Cnemidophorus tigris (C)* *Gerrhonotus multicarinatus (C)* *Anniella* pulchra *(0)* *Diadophis punctatus (0)* *Lampropeltis zonata (0)* ***Masticophis lateralis*** *(C)* *Pituophis melanoleucus (C)* *Tantilla planiceps* ***(R)*** *Thamnophis couchi (C)* *Crotalus viridis (C)*
Southern Oak Woodland	*Quercus agrifolia* *Quercus chrysolepis* *Juglans californica* *Toxicodendron diversi-lobum*	*Ensatina* ***eschscholtzi*** *(0)* *Batrachoseps attenuatus (C)* *Batrachoseps major (C)* *Aneides lugubris (C)* *Taricha torosa (C)* *Bufo boreas (C)* *Bufo microscaphus (R)?* *Hyla regilla (C)*	***Sceloporus occidentalis*** *(C)* *Uta* ***stansburiana*** *(C)* *Eumeces skiltonianus (0)* *Eumeces gilberti (R)* *Gerrhonotus multicarinatus* ***(C)*** *Anniella pulchra (0)* *Coluber constrictor* ***(R)*** *Masticophis* ***lateralis*** *(C)* *Diadophis punctatus (0)* ***Pituophis*** *melanoleucus (C)* *Crotalus viridis (C)*

paths between plants. The earth is hard except locally beneath bushes where leaf litter has accumulated; from where legless lizards, *Anniella pulchra,* and spadefoot toads, *Scaphiopus hammondi,* may be collected.

Coastal sage scrub supports a reduced chaparral fauna. The climate is hotter and drier, and there is less cover than in chaparral. Precipitation of 494.5 mm per year less than the calculated potential evapotranspiration indicates a moisture deficiency of 172.7 mm greater than that calculated for chaparral. The evapotranspiration ratio is 2.03. The faunal elements in coastal sage scrub that are not apparently present in chaparral are burrowing forms such as *Scaphiopus hammondi* and *Anniella pulchra* that inhabit areas of fine sandy soil not readily available in chaparral.

The red racer, *Masticophis flagellum,* seems to have been moderately common in this habitat in the past, but now is absent or rare on the Pacific slope. No records have been reported since 1930. Destruction of the community by extensive cultivation and the increase in human habitation, have evidentally eliminated the red racer from the coastal slope. It still inhabits the desert slope.

3. Yellow Pine Forest

The yellow pine forest has a marked lack of undergrowth consisting of tall trees with few shrubs. Absence of cover plus steep slopes and severe winters tend to limit the distribution of amphibians and reptiles. Three amphibians occur in this belt. *Ensatina eschscholtzi* has been taken at 2400 meters in the Big Pines Recreation Area, *Bufo boreas* is numerous around Jackson Lake, and the Pacific treefrog, *Hyla regilla,* maintains a low density population.

This community is best described in comparison to chaparral because of a broad ecotone between them from 1600 to 2300 meters on the Pacific slope. Exposed sunny slopes (south-facing) in the ecotone are covered by stands of manzanita, *Arctostaphylos glauca,* and shady, north-facing slopes by big-cone Douglas fir, *Pseudotsuga macrocarpa.* The alligator lizard, *Gerrhonotus multicarinatus,* an abundant form in yellow pine, also is found in areas dominated by big-cone fir, but not normally in adjacent manzanita at the same elevation. Also in this ecotonal area the sagebrush lizard, *Sceloporus graciosus,* tends to replace *Sceloporus occidentalis.* The replacement is not complete because *occidentalis* sometimes extends to 2400 meters where *graciosus* prevails. Both lizards are common in the lower yellow pine forest at Charlton Flats. *Sceloporus graciosus* seldom is found in other than yellow pine forest where it is the most abundant lizard. Other common lizards are *Sceloporus occidentalis, Gerrhonotus multicarinatus,* and *Eumeces skiltonianus* (blue-tailed skink). Stangely, *Phrynosoma coronatum* also appears fairly abundant near 1900 meters on the desert slope. A number of these horned lizards have been collected at Big Pines.

Pituophis melanoleucus, Masticophis lateralis, and *Lampropeltis zonata* (mountain kingsnake) are snakes characteristic of yellow pine forest. *Lampropeltis zonata* has the yellow pine zone as its center of distribution, but sometimes occurs in chaparral. Invasion of chaparral may have been secondary, with immigration first occurring down canyons through riparian habitats and then laterally to chaparral. *Crotalus viridis* is the common rattlesnake in yellow pine forest, where it is notable that specimens often are darker in color than those from chaparral. Similar to *Crotalus viridis cerberus* from Arizona, some specimens from the San Gabriels have a dark, iridescent green cast on their dorsum.

Climate of yellow pine forest is cooler and moister than that of chaparral. Evapotranspiration data for Big Pines indicate a probable surplus of 239.3 mm of moisture, most of which is lost because of rapid runoff on the steep slopes. The evapotranspiration ratio was calculated as 0.79.

4. Sagebrush Scrub

Sagebrush scrub tends to grow in flat, sandy areas within the yellow pine forest. The general nature of the sagebrush herpetofauna is similar to that of coastal sage scrub, even though the two communities are on opposite sides of the mountain range. Both are depauperate chaparral faunas. Similarities are probably due to the similar relationships of both communities to chaparral. Sagebrush scrub grade into chaparral at both the western and eastern ends of the mountain range, through Soledad and Cajon Canyons, respectively. Gradation occurs in a manner similar to that between the coastal sage scrub and chaparral at lower elevations. Both sagebrush communities offer less cover and are characteristically more arid than chaparral. Arid conditions contribute to the absence of forms such as *Eumeces skiltonianus* from both. The most common lizards of the community appear to be *Sceloporus graciosus* and *Phrynosoma coronatum;* the snake *Masticophis lateralis* also is abundant. No climatic data are available for this community in the San Gabriel Mountains.

5. Pinyon Pine Woodland

Pinyon pines are characteristic of the crests of hills on the desert slope, above the juniper belt and often on bare rock. Because of a tendency for these pines to occur only on ridges, animals that inhabit the plant community must be able to withstand exposed conditions. No climatic data are available, but the woodland appears arid, hot, and windy. The community includes a herpetofauna of ten species. The ubiquitous forms such as *Sceloporus occidentalis* and *Uta stansburiana* make up the greatest part of the fauna, and two wide spread amphibians, *Bufo boreas* and *Hyla regilla,* occur in restricted numbers near water.

6. Juniper Woodland

Junipers lie in an extensive belt along desert slopes of the mountain range. A pinyon-juniper complex such as that described by Munz and Keck (1959) is not common in the San Gabriels. The vegetation forms a low brushy cover on sandy or rocky soil. Climatic data for this woodland indicate aridity exceeded only in the Joshua tree community. Evapotranspiration data show a deficiency of 602.45 mm below the calculated potential of 883.95 mm. The evapotranspiration ratio is 3.14. This community marks the uppermost altitudinal limit of many of the typical desert faunal elements, such as the leopard lizard, *Crotaphytus wislizeni;* yucca night lizard, *Xantusia vigilis;* red racer, *Masticophis flagellum;* and glossy snake, *Arizona elegans.* The spadefoot toad, *Scaphiopus hammondi,* has not been collected in either the juniper or Joshua tree community, but the occurrence of the species on the desert slope is not improbable. *Bufo boreas* occurs near permanent water, and *Hyla regilla* has been taken in moist situations.

7. Joshua Tree Woodland

Joshua tree woodland is the most arid of the San Gabriel Mountain plant communities. Evapotranspiration rate is 727.9 mm below potential, which dictates the presence of a xerophytic desert flora. Potential evapotranspiration ratio of 4.9 is the highest of the San Gabriel Mountain plant communities. Where this arid climate is coupled with deep, sandy soil, Joshua trees abound. The fauna is typically desert in composition, and many species found here occur nowhere else in the mountain range. The sidewinder, *Crotalus cerastes,* and the Mojave rattlesnake, *Crotalus scutulatus,* reach their highest elevational limit in the Joshua tree community, and are replaced by *Crotalus viridis* at higher elevations. The banded gecko, *Coleonyx variegatus,* and the desert spiny lizard, *Sceloporus magister,* are other examples of desert forms that occur no higher than the Joshua tree belt. *Sceloporus occidentalis* and *Crotalus viridis* are examples of montane forms that reach their lowest altitudinal limits in this woodland. Probably the most characteristic reptile is *Xantusia vigilis,* which occurs under the fallen arms of the Joshua trees.

8. Riparian Woodland

In semiarid regions moisture in the form of a flowing stream acts to superimpose on the ecosystem a community of plants and animals that is not consistent with local regimes of temperature and precipitation. Munz and Keck (1959) did not consider this association among their plant communities of California. However, Benson (1957) and Lowe (1964) maintained that the riparian association is a distinctive, climax biotic community.

In the San Gabriel Mountains, stream channels are characterized by three kinds of ecologic situations, depending on the amount of water. First, subsurface water in the stream bed allows a more luxuriant growth of whatever plant community is adjacent; the herpetofauna of these areas is not distinctively riparian. Campbell and Green (1968) called such plant associations "pseudoriparian". Second, many areas of a stream channel are sandy, boulder-strewn wazhes that support little or no vegetation. The herpetofauna of these washes often is not distinctive. In the San Gabriels, however, the collared lizard, *Crotaphytus collaris,* seems to occur nowhere else, and appears to have followed stream channels by way of intermittent washes to the Pacific slope where the species is now locally abundant in Cajon Wash, Lytle Creek, and the upper East Fork of the San Gabriel River. Other desert reptiles such as the zebra-tailed lizard, *Callisaurus draconoides;* the desert horned *lizard ,Phrynosoma platyrhinos; Crotaphytus wislizeni;* and *Masticophis flagellum,* also seem to have moved by way of these washes through the stream channels of Cajon and Soledad Canyons to the Pacific slope. The third ecologic situation is truly riparian, depending almost entirely on the presence of a flowing stream. These are gallery forests, and are inhabited by the largest single assemblage of amphibian and reptile species in the San Gabriels. Most are anurans, including the California treefrog, *Hyla cadaverina;* bullfrog, *Rana catesbeiana;* red-legged frog, *Rana aurora;* mountain yellow-legged frog, *Rana muscosa;* and the foothill yellow-legged frog, Rana *boylei.* Also included are a pond turtle, *Clemmys marmorata,* and an aquatic garter snake, *Thamnophis couchi.* Many species commonly found in other associations also are abundant in the riparian woodland. Amphibians such as the newt, *Taricha torosa; Ensatina eschscholtzi; Bufo boreas;* and *Hyla regilla* are found elsewhere, but are most commonly associated with riparian vegetation. The snakes ocurring

along stream banks are *Crotalus viridis*, *Pituophis melanoleucus*, *Lampropeltis zonata*, and the ring-necked snake, *Diadophis punctatus*. Lizards characteristic of the riparian plant community are *Gerrhonotus multicarinatus* and *Sceloporus occidentalis*.

9. Southern Oak Woodland

The herpetofauna of oak woodland bears a resemblance to that of riparian communities; both areas are inhabited by a number of amphibians. However, the amphibian fauna of the riparian community is characterized by anurans, whereas that of oak woodland is characterized by salamanders such as the two slender salamanders, *Batrachoseps attenuatus* and *Batrachoseps major*, and the arboreal salamander, *Aneides lugubris*. Characteristically a canyon bottom habitat with access to subterranean water, actual evapotranspiration tends to approach potential even though gross climatic data may imply conditions indicating semiarid vegetation. Oak woodland requires at least subterranean water, but not a permanent stream, therefore frogs, turtles, and water snakes are characteristically lacking. Of the salamanders, *Aneides lugubris* might be restricted to the oak woodland. Only one specimen has been reported east of the Los Angeles-San Bernardino County line, beyond which oak woodland is lacking. This woodland represents an excellent habitat for a number of reptiles that require a loose, moist soil or abundant litter. *Diadophis punctatus*, *Anniella pulchra*, and *Gerrhonotus multicarinatus*, therefore, are characteristic inhabitants.

One type of oak community, the oak savannah, is absent from the San Gabriel range. This habitat is characterized by widely-spaced trees and a ground cover principally of grass. The San Gabriel Mountains are steep and lack low altitude flats and rolling hills where oak savannah thrives. In adjacent mountain ranges Gilbert's skink, *Eumeces gilberti*, and the yellow-bellied racer, *Coluber constrictor*, occur in such areas and both are rare in the San Gabriels.

BIOGEOGRAPHY

Peabody and Savage (1958) and Savage (1960) correlated the western herpetofauna with the history of Arcto-Tertiary and Madro-Tertiary geofloras as described by **Axelrod** (1957). For example, salamanders are fundamentally Arcto-Teriary, and lizards and snakes are fundamentally Madro-Tertiary in historical relationships. Anurans are transitional because some forms appear to be **Arcto-Tertiary** associates while others are of Madro-Tertiary relationships. The present herpetofauna of the San Gabriels has been affected by specific and subspecific differentiation as a result of events since Tertiary time. The herpetofauna may be divided into four groups of Arcto-Tertiary relationships and four of Madro-Tertiary relationships (Table 2).

Arcto-Tertiary animals in dispersing through California tended to split around the east and west sides of the Great Valley **depression.** However, dispersal down the west coast was interrupted during the first half of the Pleistocene by the San Joaquin embayment (Peabody and Savage, 1958). This salt water barrier to southern **dispersal** allowed time for some coast range forms to become differentiated from the eastern (Sierran) forms. The San Gabriel Mountains lie at the point of juncture of the southward Arcto-Tertiary dispersal routes because the Coast Range joins the San Gabriels through the Santa Suzanna range to the west and the Sierra Nevada joins through the Tehachapi and Sawmill ranges to the north (Figure 3). However, few species

Table 2 - Herpetofauna According to Geofloral Association and Dispersal Route

A. Arcto-Tertiary Geofloral Relationships

1. **Recent Coast Range Immigrants**

Bufo boreas
Rana aurora

2. **Species with ancestors in southern California prior to the San Joaquin embayment**

Taricha torosa
Batrachoseps major
Aneides lugubris
Clemmys marmorata

3. **Immigrants from both the Coast Range and Sierra Nevada**

Ensatina eschscholtzi
Batrachoseps attenuatus

4. **Introduced species**

Rana catesbeiana

B. Madro-Tertiary Geoflora Relationships

1. **Immigrants** *via* **northern pathways**

Rana boylei
Rana muscosa
Sceloporus graciosus
Diadophis punctatus
Lampropeltis zonata
Eumeces skiltonianus
Coluber constrictor
Thamnophis couchi
Crotalus viridis

2. **Southern chaparral corridor immigrants**

Scaphiopus hammondi
Bufo microscaphus
Hyla cadaverina
Hyla regilla
Phrynosoma coronatum
Gerrhonotus multicarinatus
Eumeces gilberti
Anniella pulchra
Lampropeltis getulus
Masticophis Zateralis

Table 2 - (Continued)

Southern chaparral corridor immigrants (Continued)

Lichanura trivirgata
Leptotyphlops *humilis*
Tantilla planiceps
Trimorphodon vandenburghi
Hypsiglena *torquata*

3. Desert Immigrants

Phrynosoma platyrhinos
Sceloporus magister
Callisaurus draconoides
Crotaphytus ***collaris***
Crotaphytus wislizenii
Coleonyx *variegatus*
Xantusia ***vigilis***
Masticophis flagellum
Crotalus cerastes
Crotalus *scutulatus*

4. Immigrants from both the desert and chaparral corridor

Sceloporus *occidentalis*
Uta stansburiana
Cnemidophorus tigris
Arizona elegans
Pituophis ***melanoleucus***
Salvadora hexalepis
Rhinocheilus lecontei

Figure 3 - Map of southern California showing the probable dispersal routes into the San Gabriel Mountains for the herpetofaunal species of Arcto-Tertiary relationships

appear to have traversed both dispersal routes to the San Gabriel Mountains. Most forms appear to have entered southern California through the Coast Range, either before or after the time of the San Joaquin embayment. Based on dispersal routes and migratory pathways, four groups of the present herpetofauna of Arcto-Tertiary relationships may be recognized.

1. Coast Range Immigrants.

These species probably dispersed to the San Gabriel Mountains through the Coast Range subsequent to the disappearance of the San Joaquin embayment, during the last 50,000 years. Only two forms may be placed in this category, *Bufo boreas* and *Rana aurora.* Savage (1960) referred to these as part of the ancient, circumpolar, Holarctic Element, which only recently has invaded North America across the Bering Strait.

2. Species with Ancestors Present in Southern California Prior to the San Joaquin Embayment.

This group is comprised of elements that probably moved to southern California at least by early Pliocene. The embayment evidentally isolated these populations in southern California during late Pliocene and early Pleistocene. Retreat of the salt water barrier allowed some northern and southern populations to be reunited *via* the Coast Range. The embayment was of sufficient duration, however, to allow differntiation between northern and southern populations of *Taricha torosa* and *Clemmys marmorata.*

Aneides lugubris is a salamander whose ancestors were of Arcto-Teriary affinities but is now restricted to oak woodland, a plant community of Madro-Tertiary derivation. Wake (1960) stated that *Aneides lugubris* was probably differentiated from *Aneides ferreus* during the time of the San Joaquin embayment when it was isolated probably in oak woodland. Aridity and the absence of suitable habitat in •the eastern portion of the San Gabriel range apparently has blocked dispersal eastward to the San Bernardino range, but the species has reoccupied the Coast Range, extending to north of San Francisco.

The slender salamander, *Batrachoseps major,* similar to *Aneides lugubris,* appears to have evolved in association with Madro-Tertiary vegetation from an early Pliocene ancestor that was associated with the Arcto-Tertiary geoflora. Brame and Murray (1968) theorize that *Batrachoseps relictus* became isolated in Arcto-Tertiary vegetation of the San Pedro Martir in Baja California during the time of the San Joaquin embayment. These *relictus* populations likely gave rise to *major* which was able to survive in communities of the Madro-Tertiary geoflora that *relictus* was unable to penetrate. *Batrachoseys major,* in late Pleistocene evidentally moved north in association with oak woodland and riparian plant communities to northern Los Angeles County where it is now sympatric with *Batrachoseps attenuatus* of probable northern origin.

3. Immigrants From Both the Coast Range and the Sierra Nevada.

The classical Rassenkreis of subspecies of the salamander, *Ensatina eschscholtzi* is an example resulting from this dispersal pattern. Intergradation of subspecies occurs around the great central valley of California except in the southern portion of the distribution in the San Bernardino Mountains, where the spotted Sierran form and the

solid-colored coastal form are sympatric (Stebbins, 1957). A report needs to be verified of a spotted form observed by Kenneth E. Stager of the Los Angeles County Museum of Natural History at Coldbrook Camp on the North Fork of the San Gabriel River. The presence of spotted Ensatina in the San Gabriels would fill the gap between the Tehachapi Mountains and the San Bernardino Mountains, thereby completing the Rassenkreis pattern. Coldbrook Camp recently was devastated by a forest fire, which may have eliminated spotted Ensatina from the San Gabriel Mountains. If the North Fork of the San Gabriel were a refuge for spotted Ensatina it would be in keeping with *Rana* ***boylei*** which maintains a low density population in the same vicinity.

Coldbrook Camp lay in an oak woodland, near a riparian community. Spotted Ensatina have been collected in similar associations in the San Bernardino and San Jacinto Mountains to the south (Stebbins,1957). One might expect, however, to find the spotted form in the yellow pine forest as it occurs in mountain ranges to the north as *Ensatina eschscholtzi croceater.* The apparent absence of *E. e. croceater* as well a the rubber boa, *Charina bottae,* from the yellow pine forest of the San Gabriel Mountains may be related to the scarcity of a major forest habitat, flatlands covered with pines.

Evidentally, during the cool, moist stages of Pleistocene, yellow pine forest shifted south (Axelrod, 1967), which also allowed southern dispersal of forms such as *Ensatina* and *Charina.* Though the time of initial uplift of the San Gabriels is a subject of some disagreement, ranging from late Eocene (Arnold and Strong, 1905) to late Pliocene (Hill, 1930), **Axelrod** (1967) assumed that by the time of the Plio-Pleistocene transition the transverse ranges had reached at least half their present altitude. Bailey and Jahns (1954) indicated that by mid-Pleistocene the present-day altitudes were reached. In post-glacial times, since approximately 12,500 years ago, chaparral and other xerophytic plants advanced up the slopes until the present pattern was formed with isolated islands of yellow pine forest near the tops of the mountains, surrounded by semiarid and arid lands. Animal species inhabiting coniferous forests were forced to retreat, or to adapt to new habitats. Perhaps steep slopes of the San Gabriels were suitable for the yellow pine community and many of its animal inhabitants, but *E. e. croceater* and *Charina bottae* were not able to survive. Slopes of the San Bernardino and San Jacinto ranges, where these species occur are not nearly as steep as those in the San Gabriels. In addition, the San Bernardino habitat is more lush, with more and larger trees, bearing a striking resemblance to the coniferous communities of the Greenhorn area of the southern Sierra Nevada where spotted *Ensatina* occur. The absence of *E. e. croceater* in the San Gabriel yellow pine community and resultant lack of competition may be responsible for the presence of the solid-colored form, *E. e.* ***eschscholtzi,*** in what would be *croceater* habitat.

Batrachoseps attenuatus, the slender salamander of northern origin, also may be included in this group. Peabody and Savage (1958) considered this species a recent coast range immigrant, but Brame and Murray (1968) stated that this form probably dispersed to the San Gabriel range in association with vegetation of Madro-Tertiary relationships. Brame and Murray (1968) indicated that *B. attenuatus* similarly to *B. major* evolved from *B.* ***relictus*** by moving into communities of the Madro-Tertiary geoflora. In this case, however, the process occurred north of the San Joaquin embayment and southward immigration during Pleistocene through the coastal ranges and the foothills of the Sierra Nevada has placed this salamander in sympatry with its southern relative, *B. major.* Unlike *Ensatina,* however, *B. attenuatus* has undergone little differentiation so that the San Gabriel Mountain form bears

affinities to animals from both the Coast Range and the Sierra Nevada.

4. Species Introduced by Man.

The bullfrog, *Rana catesbeiana,* is an introduced element of eastern Arcto-Tertiary relationships. No other introduced forms are known to occur in the San Gabriels.

The flora of the San Gabriels is principally of Madro-Tertiary origin, as is most of the herptofauna. All the snakes and lizards, and a number of the anurans, appear to have dispersed to the San Gabriel Mountains in association with the Madro-Tertiary geoflora. Most of the herpetofauna of Madro-Tertiary relationships has spread to the San Gabriels by two pathways — by way of a continuous belt of chaparral through southern California, and/or by way of the desert. Savage (1960) referred to these as the Californian and Sonoran Desert faunal components, respectively. Some species of Madro-Tertiary origin may have dispersed northward through the area that is now the Great Basin and then moved south along the Coast and Sierra Nevada Ranges to the San Gabriels through pathways of semiarid vegetation. These routes are indicated in Figure 4. Based on these [illegible] present herpetofauna of Madro-Tertiary relationships may be categorized into four groups.

1. Immigrants *via* Northern Pathways.

Most species that appear to have used pathways from the north seem to have traversed both the Coastal and Sierra Nevadan corridors. These species are *Sceloporus graciosus, Diadophis punctatus, Lampropeltis zonata, Coluber constrictor, Thamnophis couchi,* and *Crotalus viridis.* Of the skinks, *Eumeces skiltonianus* probably dispersed from the north using only the Coast Range and its range overlaps with *Eumeces gilberti,* a southern immigrant.

The apparent absence of the rubber boa, *Charina bottae,* probably due to the lack of high elevation flatlands, has been discussed. If this boa were to be discovered in the San Gabriels, it would be added to the list of Madro-Tertiary species that have dispersed from the north. The San Gabriels represent a discontinuity in the known geographic range of *Charina bottae* in a pattern similar to that for the spotted form of *Ensatina eschscholtzi.* It appears, however, that *Charina* used only the Sierra Nevada as a dispersal route. The absence of flatlands in the San Gabriels probably has contributed to the scarcity of another major habitat, oak savannah. If these savannahs were present, the California red-sided garter snake, *Thamnophis sirtalis,* probably would occur, and it also would be an immigrant from the north. In addition, if such savannahs were better established in the San Gabriels, *Coluber constrictor* and *Eumeces gilberti* might well be more abundant.

Zweifel (1955) reported on the potential sympatry of the two species of yellow-legged frog, *Rana boylei* and *Rana muscosa,* in the San Gabriel River drainage. Subsequent collections have verified this sympatry in Bear Creek, a tributary of the West Fork of the San Gabriel River. The *muscosa* ancestor evidentally spread to southern California *via* a northern Madro-Tertiary route during Pliocene, was isolated there by the San Joaquin embayment, and subsequently differentiated. Upon retreat of the marine barrier, the population of *boylei* from the north reoccupied the San Gabriel range. Subsequent aridity forced *boylei* to retreat from southern California, but left a relict population in sym-

FIGURE 4

Figure 4 - Map of southern California showing the probable dispersal routes into the San Gabriel Mountains for the herpetofaunal species of Madro-Tertiary relationships

patry with *muscosa* in the San Gabriel River. The two species, however, seem to prefer slightly different habitats. In the regions where both species occur, *R. muscosa* tends to inhabit the upper, more turbulent areas of the streams and *R. boylei* is more common in the slower, downstream portions.

2. Southern Chaparral Corridor Immigrants.

The species included in this group probably dispersed to the San Gabriel Mountains from the south by way of chaparral and coastal sage scrub plant communities. The vast expanse of chaparral that covers the Pacific slope is continuous with chaparral communities of adjacent ranges, and was once continuous with similar communities throughout Baja California, Arizona, and Sonora (Axelrod, 1957).

The chaparral corridor seems to have contributed a greater portion of the San Gabriel herpetofauna than any other dispersal route. Species that have used the corridor are primarily Pacific slope in distribution, however, some appear on the desert slope as well. Highly adaptable species such as *Phrynosoma coronatum* and *Masticophis lateralis* easily could have dispersed to the desert slope around the ends of the mountain range through Soledad and Cajon Canyons or over the crest of the range. Less adaptable forms such as *Lampropeltis getulus; Leptotyphlops humilis,* the worm snake; *Trimorphodon vandenburghi,* lyre snake; *Hypsiglena torquata,* spotted night snake; and *Scaphiopus hammondi,* the spadefoot toad must have dispersed to the desert only through the canyons around the ends of the range. These canyons are very interesting ecologically, bearing similar relationships to the mountain range in forming natural passes between the coastal and desert slopes. Vegetation of the canyons is transitional in nature: juniper and sagebrush of the desert blend into chaparral and coastal sage from the coastal slope to form a broad ecotone.

The dispersal of *Eumeces gilberti* from the south is of particular interest in the San Gabriel Mountains because of potential sympatry with *Eumeces skiltonianus,* a northern immigrant. The ranges of these closely related species overlap, but they have not been collected sympatrically in the San Gabriel Mountains. As has been discussed, the absence of oak savannah may contribute to the rarity of *Eumeces gilberti.*

The speckled rattlesnake, *Crotalus mitchelli,* seems to be the only chaparral species of the San Bernardino range that does not inhabit the San Gabriel Mountains. Typical *mitchelli* habitat in the San Gabriels occurs on dry, rocky hillsides, and is often occupied by *Crotalus viridis.* Perhaps the ubiquitous *C. viridis* provides too much competition for the more restricted *mitchelli* and thereby excludes it. A forest service employee in the Lytle Creek district reported having seen a "pink-colored" rattlesnake near Devore; if this is true then *C. mitchelli* could inhabit the southeastern tip of the San Gabriels, directly adjacent to the San Bernardino Mountains.

3. Desert Immigrants.

These forms probably dispersed to the San Gabriel Mountains by way of the Mojave Desert, and are referable to Savage's (1960) Sonoran Desert Fauna. Most are restricted to Joshua tree and juniper woodlands, but several also are found on the Pacific slope. It appears that dispersal routes from desert to the coastal slope were principally through Soledad and Cajon canyons, around the ends of the range. *Masticophis flagellum* probably made its way to the Pacific

slope through these canyons, although it is possible that these snakes also traveled northward *via* the chaparral corridor. The desert horned lizard, *Phrynosoma platyrhinos,* has been taken in Soledad Canyon and the leopard lizard, *Crotaphytus wislizenii,* has been collected in Mint Canyon (Bogert, 1930), a tributary of Soledad Canyon. These species probably followed the canyons from the desert and may maintain low density populations on the Pacific slope. Similarly, it appears that the zebra-tailed lizard, *Callisaurus draconoides,* followed Cajon Canyon to the Pacific slope, where it has been taken in Cajon wash. The collared lizard, *Crotaphytus collaris,* also has been taken on the Pacific slope, as has been discussed. This lizard probably followed the stream channels to the Pacific slope and seems restricted to dry boulder-strewn washes. They probably followed Cajon Canyon, then spread secondarily to Lytle Creek, where they are now fairly common. Their occurrence in the upper reaches of the East Fork of the San Gabriel River is most likely due to dispersal over the drainage-divide from Big Rock Creek, through the area known as Vincent Gap. Vincent Gap, 2086 meters in elevation, is the lowest spot on the drainage-divide over the entire San Gabriel range. Further collections may reveal collared lizards in the upper reaches of Bear Creek, directly opposite the South Fork of Big Rock Creek.

4. Immigrants From Both the Desert and Chaparral Corridor.

Several reptiles apparently have invaded the San Gabriel Mountain by moving northward both through the chaparral corridor and desert routes. For the most part, desert and coastal populations of the species have interbred through populations extending over the crest or around the ends of the range. Little or no differentiation is evident between most forms occupying the different slopes. However, the mountains have been enough of a barrier to allow subspecific differentiation between the coastal and desert populations of two species, *Arizona elegans,* the glossy snake, and *Salvadora hexalepis,* the patch-nosed snake. The gopher snake, *Pituophis melanoleucus,* also is represented by desert and coastal subspecies, but the coastal form extends over the crest of the range so that intergradation occurs along the desert base of the mountains. The desert and coastal forms of *Cnemidophorus tigris* also have been assigned to different subspecies, but the two forms are difficult to distinguish from one another. In some areas of southern California *Masticophis flagellum* and the banded gecko, *Coleonyx variegatus,* have dispersed both through chaparral and the desert, however, it appears that the San Gabriel Mountain populations are of desert origin.

SPECIES ACCOUNTS

Lists of localities for each species are accompanied by reference to their sources. The names of individuals or herpetological collections that have supplied records are abbreviated and placed in parentheses at the end of each record. A list of the abbreviations is given in Table 3, below.

Table 3 - Abbreviations used in locality records

AAS - Allan A. Schoenherr (personal records)
AB - Arden H. Brame, Jr., Dept. of Biology, University of Southern California; Eaton Canyon Nature Center
AHF - Herpetological collection of the Allan Hancock Foundation
ALP - Acil L. Palmer, Covina High School
AP - Art Prickett, Tujunga, California
AS - Alan Sutherland and Ray Rempt, Van Nuys, California
BB - Bayard Brattstrom, California State University at Fullerton
BHB - Benjamin H. Banta, United States International University, San Diego, California
CF - Curt Fergusen, **Placerita** Canyon Nature Center
DEH - Dean E. Harvey, Whittier Narrows Nature Center
DWF - David W. Foster, Whittier Narrows Nature Center
ECNC - Eaton Canyon Nature Center
FAP - Fletcher A. Palmer, Fullerton College
FCT - F. C. Trapani, Camp Director at Camp McKiwanis, Big Pines
FH - Frank Hovore, **Placerita** Canyon Nature Center
FWS - Frederick W. Schuierer, Cabrillo College
GRS - Glenn R. Stewart, California Polytechnic University, Pomona
HS - Howard Singer
JVL - Joseph V. Linder, Tanbark Flats Experimental Station
JLV - James L. Vial, Valley Junior College
JWK - Dr. Jens W. Knudsen, Pacific Lutheran University
KES - Kenneth E. Stager, Curator of Birds and Mammals, Los Angeles County Museum of Natural History
KSN - Kenneth S. Norris, University of California at Los Angeles
LACM - Herpetological collection, Los Angeles County Museum of Natural History
LBSC - Herpetological collection, California State University at Long Beach
LCFR - Lytle Creek Forest Ranger
LCW - Dr. Louis C. Wheeler, University of Southern California
LMK - Herpetological collection, Laurence M. Klauber
MBR - Martin B. Ruggles, Los Angeles County Museum of Natural History
MCL - Michael C. Long, Whittier Narrows Nature Center
MVZ - Herpetological collection, Museum of Vertebrate Zoology, University of California, Berkeley
PHS - Patrick H. Sullivan, Eaton Canyon Nature Center
PRE - Paul R. Ennis, University of Southern California
RC - Robert Crandall, Eaton Canyon Nature Center
RGM - Roy G. McDiarmid, Dept. of Biology, University of Southern California
SBCM - Herpetological collection, San Bernardino County Museum, Bob Sanders, Curator
SDMNH - Herpetological collection, San Diego Museum of Natural History
SHJ - Shelly H. Johnson, Pasadena City College
TWT - Terry W. Taylor, Eaton Canyon Nature Center

Table 3 - (Continued)

UCLA - Herpetological collection, University of California at Los Angeles

Class - AMPHIBIA

Fourteen amphibian species are represented in the San Gabriel Mountains, five salamanders, six frogs and three toads.

Order - CAUDATA

Family - Salamandridae

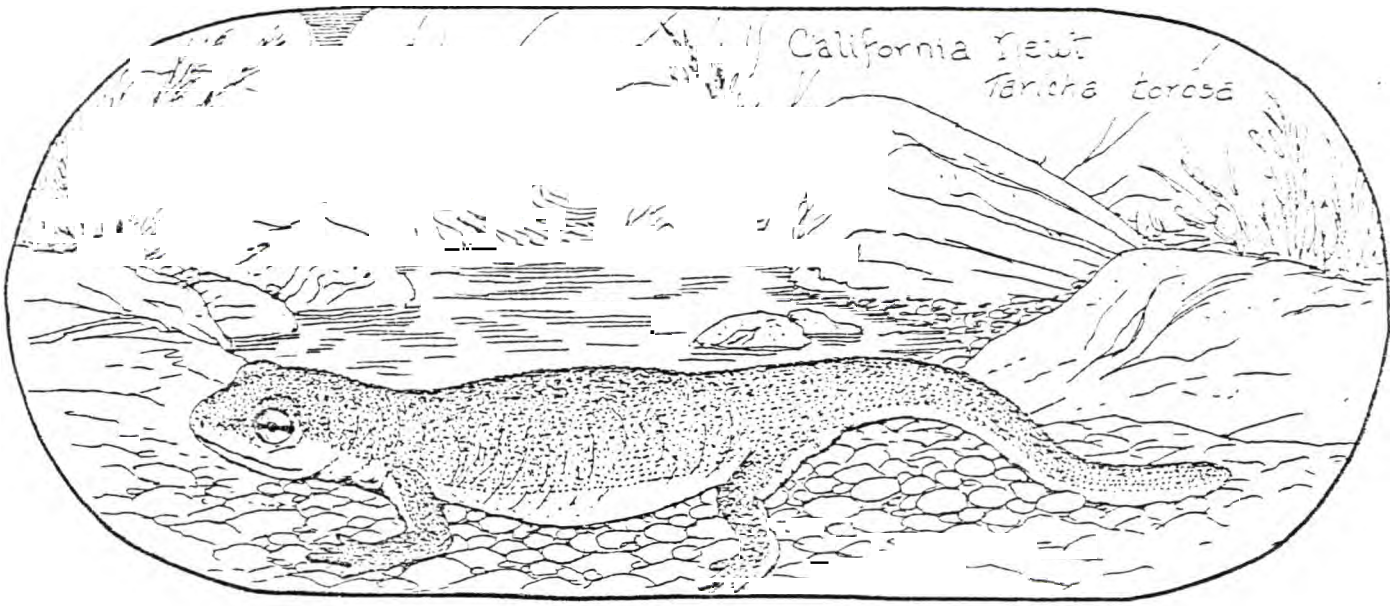
1. *Taricha torosa* (Rathke) - California Newt

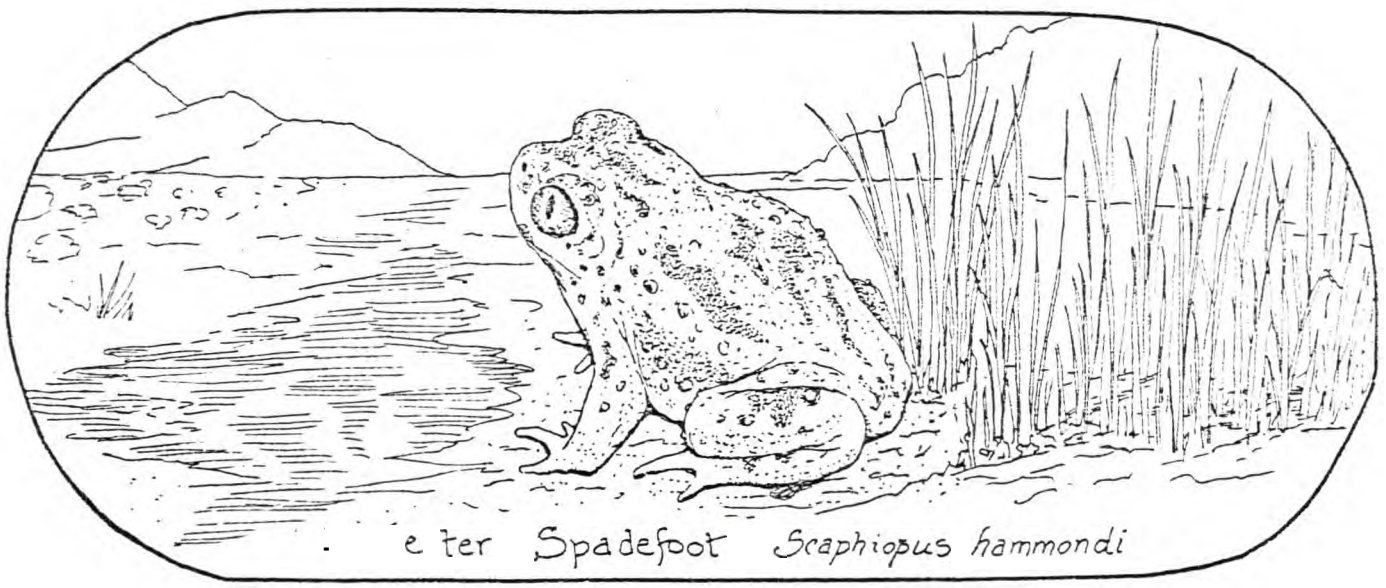
From February to September, *Taricha* is auite common in the larger streams of the Pacific slope, but it does not seem to occur in any of the streams on the desert slope. *Taricha is* most commonly riparian in distribution but a few have been taken in the oak woodland under rocks and logs.

The technique of collecting salamanders by driving along the roads in the rain has yielded a large number of these newts in San Gabriel Canyon some distance from water. For the most part, the road in the canyon is high on a steep slope above the stream. On the night of February 16, 1959, in only two hours, thirteen specimens of *Taricha torosa* were collected on this road during a light rain.

On a night of intermittent rain, these newts only appear on the road while it is raining, or within a few minutes after the time the rain actually stops falling. No specimens are collected while it is not raining, even though the road may still be quite wet. Collections of *Aneides lugubris* and *Ensatina eschscholtzi* also indicate a similar type of activity. This phenomenon suggests that it is the sound of the rain striking the ground in conjunction with the increased humidit' that stimulates the activity of these salamanders rather than humidity alone. Another experience in collecting *Taricha* seems to further substantiate this theory. On February 4, 1960, *T. torosa* were collected in a riparian situation in San Dimas Canyon about 1.6 kilometers below the dam. It was a chilly, overcast day. The air temperature was 13°C and the substrate was still damp from the previous night's rain. Several hours of rolling rocks and logs by four people had produced only two specimens of *Taricha.* It then began to rain slightly with large drops making a patter on the leaf litter under the trees. Within five minutes, seventeen *Taricha torosa* were collected as they walked about on the leaves, under which they apparently had been hiding. The rain lasted only five minutes. After it stopped no more specimens were collected.

During the dry season of the year, from April to September, *Taric* is found most characteristically in pools and ponds of the larger streams from 400 to 800 meters elevation. *Taricha* normally is absent from fast moving water. Even though some individuals of the species are active throughout the summer in pools of the larger streams, other individuals estivate. Estivating specimens may be collected within four or five feet of a stream in which individuals are active. Presumably, individuals of this species estivate to escape desiccation, but there seems to be no obvious explanation for the tendency of some


California Newt
Taricha torosa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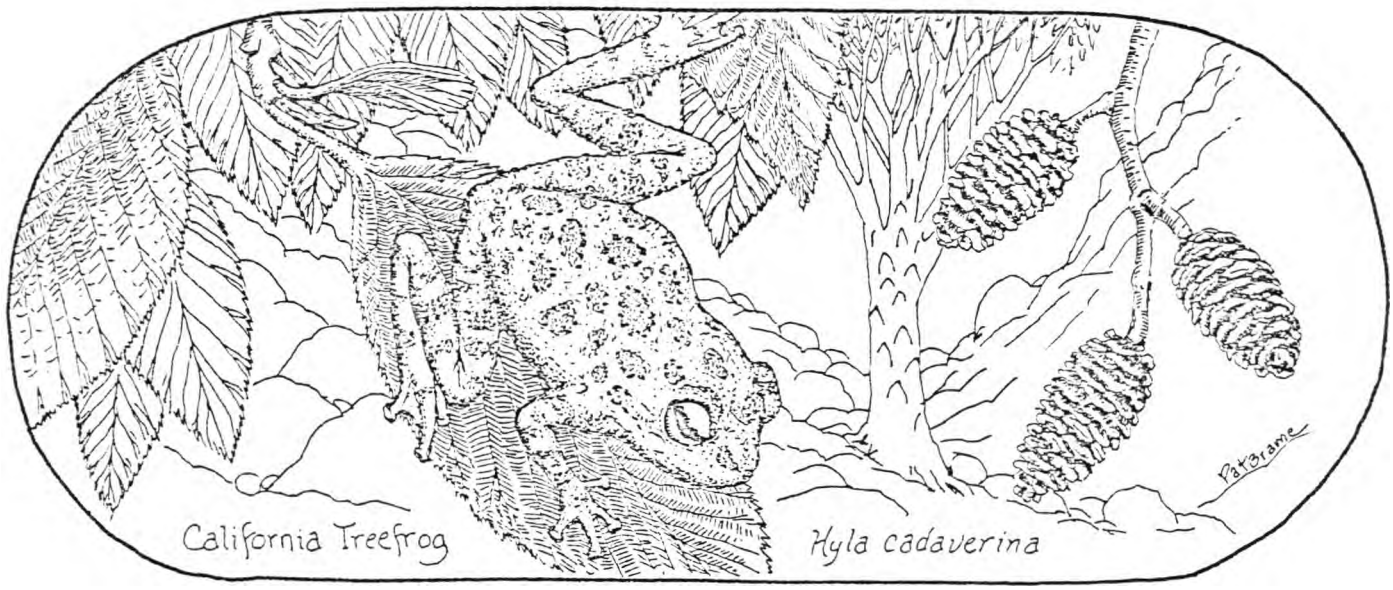

California Treefrog
Hyla cadaverina

members of a population to estivate and others to remain active. Specimens have been collected in Big Santa Anita Canyon and Bear Creek in July and August when air temperatures exceeded 30°C. In June, 1950, at Millard Canyon fourteen adults were found by Charles H. Lowe, Jr. estivating in a hole under a rock. Individuals were also found in the stream. The air temperature at the time, 8:30 A.M., was 19.8°C (Stebbins, 1951).

Locality records (Figure 6)

Los Angeles County
Tujunga Creek (LACM)
Arroyo Seco Canyon, 0.1 mile below Waterman guard station (UCLA)
Arroyo Seco Canyon, San Rafael Heights near Pasadena (UCLA)
Mouth of Arroyo Seco Canyon (MVZ)
Millard Canyon Creek between public forest camp and waterfall (UCLA)
Eaton Canyon, 0.5 mile SW of Idlehour Campground (MCL)
Fish Canyon near Pasadena (MVZ)
Sierra Madre and 1.5 miles N (MVZ)
Little Santa Anita Canyon (LACM)
Winter Creek (Slevin, 1928)
Big Santa Anita Canyon, 1900 feet and 2800 feet (AAS)
East Fork Santa Anita Canyon below Mt. Monrovia (AHF)
Santa Anita Canyon at the falls (MVZ)
Monrovia Canyon, 0.5 mile above the dam (AAS)
Devil's Canyon-Bear Canyon Wild Area (AHF)
West Fork San Gabriel River, 1.8 miles W of Crystal Lake Road (KSN)
West Fork San Gabriel River, 1.5 miles above Crystal Lake Road (UCLA)
Bear Creek, 1700 feet (AAS)
San Gabriel Canyon from East Fork junction to 2.0 miles N (AAS)
San Gabriel Canyon from main fork to 2.0 miles E on East Fork (AAS)
San Gabriel Canyon from San Gabriel Dam No. 1 to East Fork junction (AAS)
San Gabriel Canyon, 1250 feet (AHF)
Fish Canyon near Azusa (Riemer, 1958)
Fresh Creek near Azusa (UCLA)
Big Dalton Canyon, 0.5 mile above the mouth (AAS)
Big Dalton Canyon (LMK)
Sycamore Canyon, 0.5 mile above the mouth (AAS)
San Dimas Canyon from dam to 1.0 mile S (AAS)
San Dimas Canyon, above dam (DWF)
2.0 miles NW Claremont (Riemer, 1958)

Family - Plethodontidae

2. *Ensatina eschscholtzi* Gray - Monterey Salamander

Previously, *Ensatina* has been considered rare in the San Gabriels (Bogert, 1930) but extensive collection has revealed them to be fairly common in a number of habitats. From the variety of habitats in which *Ensatina* has been collected it appears that it is the most adaptable of all the salamanders in the San Gabriel range.

On the night of February 1, 1960, during a hard rain, *Ensatina* was the most common salamander on the roads. Seven were collected in San Gabriel Canyon, four were taken in chaparral situations and three in the oak woodland. On the same night, high on Glendora Mountain Road, at an elevation of 980 m, one was collected in the chaparral

with no stream anywhere near the locality. Dr. Jens W. Knudsen report- the collection of specimens from a woodrat nest in the chaparral. Specimens have also been collected in the yellow pine community. On April 13, 1959, one subadult was collected in the Big Pines Recreation Area at 2200 m elevation. The specimen was taken from under a damp yellow pine log on a very steep north *facing* slope. Patches of snow were still on the ground.

A very large specimen, 85 mm in snout-vent length and 155 mm in total length, was collected in a riparian community in San Dimas Canyo on February 5, 1959.

Up to this point, the discussion has been concerned mainly with the red variety of the species, *Ensatina e. eschscholtzi,* which has always been considered the only subspecies inhabiting the range. Perhaps *E. e. croceater* occurs at Coldbrook Campground on the North Fork of the San Gabriel River. Coldbrook Camp is an oak woodland-riparian area at 1000 m elevation on the Pacific slope. Kenneth E. Stager, Curator of Birds and Mammals at the Los Angeles County Museum of Natura History stated in conversation that he has seen *croceater* at this locality. Mr. Stager reports that while on an ornithological collecti trip in the early 1950's, he and several other persons found a large specimen under a plank near a woodpile. Unfortunately, the specimen was not collected since no proper equipment had been brought along. Mr. Stager describes the color of the specimen as chocolate brown with large yellow spots, about the size of the tip of one's finger, on its back.

There is good reason to believe that *croceater* should occur in th San Gabriels because the San Gabriel range represents a discontinuous portion in the center of the geographic range of the salamander. *E. e. croceater* has been collected in the San Bernardino Mountains to the east and the Tehachapi Mountains to the northwest, but it has never be recorded in the San Gabriels. The presence of the subspecies *eschscholtzi* at Coldbrook Camp means that if *croceater* also occurs at the sam locality, both subspecies are symnatric. Sympatry between these subspecies fits perfectly into the Rassenkreis pattern exhibited by the species. Interbreeding subspecific populations of *Ensatina eschscholtz* range all the way around the great central valley of California, but non-interbreeding populations of the spotted and red forms occur farth south in San Diego County. The presence of non-interbreeding spotted and red forms in the San Gabriels completes the only gap in the otherwise perfect Rassenkreis pattern.

Mr. Stager is an experienced field man and there is no reason to doubt his observation, so there must be a logical explanation for the presence of the spotted form at a known *eschscholtzi* locality in the San Gabriel Mountains. An unlikely explanation is that someone carrie the specimen there from some other locality and set it free. A second possible explanation is that the observed spotted specimen was a mutan individual in a red-backed population, or perhaps it was *Aneides lugubrig* with large spots. Other peculiar specimens have also been collected from the Coldbrook population. One such specimen collected the night of February 1, 1960, seemed to lack red pigment completely. Its eyelids were white and the rest of the body was brownish color, a grea deal like that of *Aneides lugubris.* Another explanation is that a relict, low density population of spotted forms occurs near Coldbrook Camp and only one specimen has been observed. It is interesting to note that a relict population of *Rana boylei* occurs in the same canyon just south of Coldbrook Camp.

Locality records (Figure 6)

Los Angeles County
- Cortelyou Springs, 6840 feet, 10 miles W of Vincent Gap, along Angeles Crest Highway (MCL,MBR)
- 1.0 mile S Big Pines Recreation Area Headquarters, 7200 feet (AAS)
- 0.5 mile NW entrance to Big Pines Recreation Area Headquarters, 6500 feet (Stebbins, 1949)
- Placerita Canyon Road, 5.7 miles W Solemint (LACM)
- Lopez Canyon near forest ranger station (JWK)
- Bartholous (Indian) Canyon between Lopez and Kagel Canyons (JWK)
- Kagel Canyon (JWK)
- Millard Canyon (Bogert, 1930)
- Eaton Canyon, 0.5 mile SW Idlehour Campground (MCL,MBR)
- Bailey Canyon, 2500 feet (MVZ)
- Tunnel in Bailey Canyon (Stebbins, 1949)
- Sierra Madre (MVZ)
- Sierra Madre, 2600 feet (Stebbins, 1949)
- Little Santa Anita Canyon, 2200 and 2500 feet (MCL,MBR)
- Big Santa Anita Canyon (Stebbins, 1949)
- Monrovia Canyon (UCLA)
- Pine Flats (Bogert, 1930)
- Soldier Creek, 5300 feet, 0.25 mile S Crystal Lake Public Camp (Stebbins, 1949)
- Crystal Lake Road near Coldbrook guard station (AAS)
- Coldbrook Camp (Stebbins, 1949)
- Coldbrook Camp (KES) - possible *croceater*
- Crystal Lake Road, 4.5 and 5.0 miles N East Fork cutoff (AAS)
- San Gabriel Canyon near East Fork cutoff (AAS)
- San Gabriel Canyon on road near San Gabriel Dam No. 1 (AAS)
- Glendora Mountain Road, 3200 feet (AAS)
- San Dimas Canyon from dam to 1.0 mile S (AAS)
- Live Oak Canyon at end of road (AAS)
- Palmer's Canyon (Slevin, 1928)
- San Antonio Canyon, 3.0 and 4.0 miles N national forest boundary (AAS)
- San Antonio Canyon, 0.75 mile S Camp Baldy (AAS)

San Bernardino County
- North Fork Lytle Creek near Glenn Ranch (FWS)
- Hills NW San Bernardino (MVZ)

3. *Batrachoseps attenuatus* (Eschscholtz) - California Slender Salamander

Batrachoseps attenuatus, when present, is usually abundant. It is commonly found during the rainy season in the oak woodland and to some extent in the riparian community. This salamander is most common in damp places in the oak woodland and tends to inhabit the space under any litter such as pieces of cardboard, wood or rocks and logs. In the San Gabriels the species occurs only on the Pacific slope, usually from about 340 to 920 m. In general, *Batrachoseps attenuatus* may be found wherever there is oak woodland. It is absent from the arid southeastern portion of the mountains in San Bernardino County.

Batrachoseps is usually the first salamander to appear in the rainy season. In the winter of 1958-59, an unusually dry winter, the first *Batrachoseps* were collected on January 30th at 740 m elevation in Brown Canyon. Eight specimens were collected at this typical oak woodland locality under rocks and pieces of paper. The air temperature was 15°C.

On March 14, 1959, a very large *Batrachoseps attenuatus* was collected at 1100 m along the West Fork of the San Gabriel River in woodland of *Quercus chrysolepis.* The specimen was taken from the center of a rotting log and measured 118 mm in total length and 45 mm in snout-vent length. The air temperature at the locality was 27°C.

Locality records (Figure 7)

Los Angeles County
- **Placerita** Canyon State Park (LACM)
- Big Tujunga Canyon, near Big Tujunga Station (MCL,MBR)
- Big Tujunga Canyon Road, 2.8 miles W junction Mt. Wilson Road (LACM)
- Mullally Canyon, NE of La Crescenta (MCL)
- Brown Canyon, 2400 feet (AAS)
- Arroyo Seco (LMK)
- Millard's Canyon near Pasadena (Slevin, 1928)
- Altadena (UCLA)
- Eaton Canyon, N of Nature Center (ECNC)
- Eaton Canyon, 0.5 mile SW of Idlehour Cammground (MCL,MBR)
- Mt. Wilson Road (AHB)
- Bailey Canyon, 3000 feet (MVZ)
- Little Santa Anita Canyon (MCL,MBR)
- Sierra Madre, 1000 feet (Slevin, 1928)
- Big Santa Anita Canyon (LBSC)
- Monrovia Canyon, 0.5 mile N of the dam (AAS)
- Monrovia Canyon Park (UCLA)
- Monrovia Park, 1.5 miles NE Monrovia (MVZ)
- West Fork San Gabriel River, 3500 and 2500 feet (AAS)
- Bear Creek (AHB)
- Coldbrook Camp (AAS)
- Burro Canyon (LBSC)
- Big Dalton Canyon (MCL)
- **West** Fork San Dimas Canyon (KSN)
- San Dimas Canyon from 1.0 mile below dam to 2.0 miles above **dam** (AAS

4. *Batrachoseps major* Camp - Garden Slender Salamander

Batrachoseps attenuatus is generally replaced by *Batrachoseps major* at elevations below 340 m. *B. major is* restricted to the **Pacifi** slope and is most commonly collected from under debris in the foothill communities. Occasionally, however, specimens are collected in oak woodland situations on the alluvial fans.

Batrachoseps major is larger than *B. **attenuatus**.* However, the two species may be distinguished from each other most easily by the color of the ventral surface of the abdomen. *B. major* has a light ventral surface whereas *attenuatus* is dark colored. Both species show a characteristic coiling reaction upon being uncovered.

Locality records (Figure 7)

Los Angeles County
- Altadena (AAS)
- Sierra Madre, 1000 feet (Camp, 1915) - Type locality for ***Batrachosep*** *pacificus major.*
- Monrovia (AAS)
- Eaton Canyon, 0.5 mile N of Nature Center (PHS)

5. *Aneides lugubris* (Hallowell) - Arboreal Salamander

Aneides lugubris is fairly well distributed on the Pacific slope of the San Gabriels but there is only one record for San Bernardino County. The most easterly record is at the mouth of San Antonio Canyon only one kilometer east of the Los Angeles County line, when on **November** 26, 1962 one adult was collected from under a residential wood pile. Eight juveniles were collected from a damp, rotting log in the West Fork of Palmer Canyon on March 8, 1959, and one adult was collected during a rain on the road just north of Padua Hills on February 8, 1960.

Aneides seems to be restricted to the oak woodland habitat in the San Gabriels, as it is in most of southern California. Perhaps it is most common on the ground, but specimens have been taken high in trees at the University of California, Berkeley, and at heights of at least 3 m in oaks of Arroyo Seco.

During the rainy season this salamander is fairly common. For example, on the night of February 15, 1959, two specimens were collected in San Dimas Canyon on the road in the rain and under similar circumstances in San Gabriel Canyon, five specimens were collected on February 1, 1960. On the night in San Gabriel Canyon, the number of specimens of *Aneides* actually outnumbered those of the common *Taricha torosa.* In Arroyo Seco, on February 12, 1968, a total of 27 were taken by Michael Long and Marty Ruggles from leaf litter at the base of a single live oak.

Locality records (Figure 7)

Los Angeles County
- **Placerita** Canyon State Park (LACM)
- Big Tujunga Canyon (AP)
- Arroyo Seco (LMK)
- Old Dawn Mine in Millard's Canyon (Bogert, 1930)
- Eaton Canyon, in Moist Canyon (DWF)
- Eaton's Wash near Pasadena (Slevin, 1928)
- Sierra Madre (MVZ)
- Little Santa Anita Canyon (MCL,MBR)
- Santa Anita Canyon (LACM)
- Monrovia Canyon in tunnel below falls (UCLA)
- Coldbrook Camp (UCLA)
- Crystal Lake Road, 4.4 and 5.0 miles N East Fork cutoff (AAS)
- San Gabriel Canyon near dam No. 1 and 1.2 miles N (AAS)
- San Gabriel Canyon near Morris Dam (AAS)
- San Dimas Canyon 0.5 mile below the dam (AAS)
- San Dimas Canyon near Camp Throne (AAS)
- Live Oak Canyon at end of road (AAS)
- 1.5 miles NW Claremont (MVZ)
- West Fork Palmer Canyon, 0.1 mile W main fork (AAS)
- East slope Palmer Canyon, 0.25 mile N Padua Hills Theatre (AAS)
- Well up in mountains N or Claremont (Hilton, 1909)

San Bernardino County
- San Antonio Heights at mouth of San Antonio Canyon (FAP)

Order - ANURA

Family - Pelobatidae

6. Scaphiopus hammondi Baird - Western Spadefoot Toad

Records for the spadefoot toad are not numerous, but the species is probably fairly common in the coastal sage of the dry washes along the base of the Pacific slope. The species probably also occurs along the base of the desert slope, particularly in the juniper community of some of the larger drainages such as Little Rock Creek, Big Rock Creek, and Mescal Creek.

The secretive, nocturnal spadefoot is difficult to collect. Acti vity above ground seems to be limited to breeding during an indefinite season; a tendency that increases the difficulty of obtaining specimen Each time the roads were driven at night, particular attention was directed to searching typical *Scaphiopus* habitats, but no specimens were obtained. Breeding is supposed to accompany a late seasonal rain, but for the past several years there have not been sufficient late rains to create temporary pools. Consequently, there have been no *Scaphiopus* records for a number of years from the San Gabriels. However, in February, 1960, *Scaphiopus* was collected in the Santa Ana range on the roads at night in a driving rain. This collection record indicates that the species does become active in the early part of the year if conditions are favorable. According to Stebbins (1951), metamorphosing larvae were collected in Arroyo Seco Canyon on May 3, 1921, which indicates that breeding probably took place sometime in April.

Locality *records* (Figure 8)

Los Angeles County
  Arroyo Seco (Stebbins, 1951)
  Sierra Madre near Pasadena (MVZ)
  Sierra Madre, 1000 feet (MVZ)
  1.5 miles NW Claremont (MVZ)

Family - Bufonidae

7. *Bufo boreas* Baird and Girard - California Toad

Bufo boreas is found throughout the mountain range and has been collected in all habitats except the Joshua tree woodland. The species probably occurs in that community in the vicinity of water or irrigated areas. Toads are common on the roads during the rain, particularly in the coastal sage and lower chaparral communities, as well as in the riparian and oak woodland communities.

On the night of April 25, 1959, a number of toads were collected on the road in the rain. Most of the specimens were taken from a sagebrush scrub habitat at about 1540 m elevation in Big Rock Canyon. The same night a number of toads were also collected near Jackson Lake in the yellow pine community at 1860 m elevation. On the Pacific slope occasional individuals are taken on dry chaparral slopes as high as 1280 m.

Seasonal activity of *Bufo boreas* is not limited to the rainy season. Specimens have even been taken on hot nights and days in August. On August 26, 1959, one adult was taken on the Pearblossom

Road near Caldwell Lake. Three days later one juvenile was taken at midday from a pool just down stream from the dam in Little Rock Creek. The common toad, *Bufo boreas,* is the most adaptable amphibian in the San Gabriel Mountains with respect to seasonal activity and variety of habitats. In general, it may be said that if there is relatively permanent water present, *Bufo boreas* will inhabit the area.

Locality records (Figure 8)

Los Angeles County
  Little Rock Creek just N of the dam (JWK)
  Pearblossom road from Pallett Creek to Jackson Lake (AAS)
  Big Rock Creek from Pearblossom road to 2.8 miles S (AAS)
  Caldwell Lake (AAS)
  Jackson Lake (AAS)
  Soledad Canyon, 1 mile W public camo (LACM)
  Placerita Canyon near Nature Center (FH)
  Little Tujunga Canyon from guard station to 2.0 miles N (AAS)
  Big Tujunga 2.5 miles NE Sunland (MVZ)
  Arroyo Seco (MVZ)
  Altadena at Foothill and New York Drive (KSN)
  Eaton Canyon (ECNC)
  Sierra Madre (MVZ)
  2.5 miles S and 1.5 miles E Monrovia (MVZ)
  Mouth of San Gabriel Canyon (AAS)
  East Fork San Gabriel Canyon, 2.2 to 4.0 miles E main fork (AAS)
  Mouth of Big Dalton Canyon (AAS)
  Sycamore Canyon, 0.2 mile from mouth (AAS)
  San Dimas Canyon Park (AAS)
  San Dimas Canyon from 1.0 mile below dam to dam (AAS)
  Road above Live Oak Canyon (AAS)
  1.5 miles NW Claremont (MVZ)
San Bernardino County
  Sheep Creek, 4600 feet (MVZ)

8. *Bufo microscaphus* Cope - Arroyo Toad

The California race of this toad was first described by Camp (1915) as *Bufo cognatus californicus* from two specimens, one taken from Tujunga Wash. Since that time few specimens have been collected. On the Pacific slope all that have been collected have been from Big Tujunga Canyon. Factors limiting the distribution of this species are not clearly evident. Many canyons of the Pacific slope have essentially the same ecological situation. One conclusion is that *Bufo microscaphus* of Big Tujunga Canyon is a relict population of a once widespread species. Big Tujunga, a rather large, isolated drainage with few tributaries, has evidentaly supported this population and will continue to do so unless something unexpected destroys the ecologic balance.

One other idea that might explain the apparent limited distribution of the arroyo toad is that poor collecting technique has failed to produce specimens from populations in other canyons, although many herpetologists have searched the San Gabriels for specimens. Recently, on May 8, 1970, Michael Long of the Whittier Narrows Nature Center collected one in Little Rock Creek just south of the dam. There is one other possible record for *microscaphus* that should be cited. Under

journal notes for April 25, 1942, Wright and Wright (1949) refer to an egg cluster from Jackson Lake which they state could possibly be for *Bufo microscaphus.*

Locality records (Figure 8)

Los Angeles County
  Little Rock Creek, just S of the dam (MCL)
  Tujunga Wash (Camp, 1915)
  Big Tujunga Canyon from 0.5 mile S guard station to 0.5 mile E Vogel Canyon (UCLA)
  Jackson Lake (Wright and Wright, 1949) - doubtful record

Family - Hylidae

9. *Hyla cadaverina* Cope - Canyon Treefrog

The canyon treefrog is completely restricted to the riparian plant community. It is more common on the Pacific slope, but occurs also on the desert slope. Generally, this treefrog is associated with swift running streams in the proximity of large boulders and is most common from 460 to 980 **m** in elevation.

The adults of this species are usually light gray in color and exhibit marvelous protective coloration. The frogs tend to rest in depressions on large boulders in such a way that it takes close scrutiny to discern their presence. Large congregations may occur on suitable boulders; a condition that tends to give these large boulders a warty appearance. In San Sevaine Canyon on July 30, 1959, *Hyla cadaverina* was extremely abundant. Many boulders held congregations of twenty-five or more individuals. I was able to scoop up six or seven with a single sweep of my hand. In addition, each pool had a swarm of *cadaverina* tadpoles.

The tadpoles are not as restricted to boulder-strewn areas as the adults seem to be. On July 9, 1959, numerous tadpoles in all stages of development were collected at several localities in upper Pacoima Creek from 670 to 860 **m** in elevation. Due to the lack of precipitation the stream had been reduced to a series of pools with some slow-moving water connecting a number of the pools. The tadpoles were especially abundant in this creek, particularly in the pools which were so choked with algae that locomotion by the tadpoles was almost impossible. No adults were collected at this time. On July 13, 1959, tadpoles of this species were found to be abundant in a very large, almost stagnant pool, just downstream from Cogswell Dam on the West Fork of the San Gabriel River. Here also, no adults were in evidence. It is interesting to note that at both of these localities specimens of *Thamnophis couchi* were taken from the same pools.

On rainy nights when collecting was done by automobile, specimens of the canyon treefrog were occasionally encountered on the road. On two separate occasions they have been collected on the road in San Gabriel Canyon some distance from the stream.

Locality records (Figure 9)

Los Angeles County
  Little Rock Creek (Grinnell and Camp, 1917)
  Punchbowl Canyon, Devil's Punchbowl County Park, 4700 feet (MCL)

Santa Clara River, Soledad Canyon (LACM)
Placerita Canyon E of Newhall (UCLA)
Upper Pacoima Canyon, 2200 and 2800 feet (AAS)
Little Tujunga Canyon (JWK)
Tujunga Valley (MVZ)
Big Tujunga Canyon from 0.5 mile S guard station to 0.5 mile E Vogel Canyon (UCLA)
Big Tujunga Canyon, 2.5 miles NE Sunland (MVZ)
Big Tujunga Canyon at High Bridge of Angeles Forest Highway (UCLA)
Upper Big Tujunga Canyon, 1.0 mile W Wickiup Camp, 3150 feet (AAS)
Arroyo Seco near Pasadena (MVZ)
Nirio Canyon, upper Arroyo Seco (MCL)
Millard Canyon at waterfall 0.5 mile N public camp (UCLA)
Sierra Madre and 1.5 miles N (MVZ)
Santa Anita Canyon (MVZ)
Stream at Chilao Flat, 5200 feet (UCLA)
Chileno Canyon 1.0 mile W of West Fork San Gabriel River (AAS)
Monrovia Canyon, in cave (MCL,MBR)
West Fork San Gabriel River, 2100 feet, 1.5 miles below Cogswell Dam (AAS)
Bear Creek from West Fork San Gabriel River to 1.5 miles N (AAS)
West Fork San Gabriel River at bridge with main fork (AAS)
San Gabriel Canyon on road above San Gabriel Dam No. 1 (AAS)
East Fork San Gabriel River, 2.0 miles E main fork (AAS)
East Fork San Gabriel River, 1.0 mile N Cattle Canyon (AAS)
San Dimas Canyon near the dam (KSN)
Claremont (MVZ)

San Bernardino County
Day Canyon from 2800 to 3000 feet (AAS)
San Sevaine Canyon, 2150 feet (AAS)

10. *HyZa regilla* Baird and Girard - Pacific Treefrog

Hyla regilla is the most abundant anuran in the San Gabriel Mountains. It is found in or near almost every body of standing water in the mountain range. The distribution of *Hyla regilla* is like that of *Bufo boreas.* It has been collected in every plant community but Joshua tree woodland and it probably occurs there also. *Hyla regilla* also shows the all around seasonal abundance of *Bufo boreas,* but in the spring this treefrog far outnumbers the common toad. Generally, *Hyla regilla* is more common at lower elevations and in slower moving waters than *Hyla cadaverina.* Both species occur sympatrically at some localities.

The Pacific treefrog is also found in relatively dry situations. At 9:30 A.M. on June 26, 1959, six adults were collected in an oak woodland in Placerita Canyon where the stream had been reduced to a trickle. On another occasion on August 29, 1959, a single *regilla* was collected in a small pool just downstream from Little Rock Dam.

I have never observed sympatric breeding choruses of *regilla* and *cadaverina.* However, this phenomenon has been observed at Frenchman's Flat on Cherry Creek in the Santa Suzanna Mountains, Kern County. On April 4, 1959, at Frenchman's Flat, Dr. Jay M. Savage and David B. Wake observed *regilla* calling from in the water and *cadaverina* from the water's edge.

It is not uncommon to observe large breeding choruses of *regilla.* In the spring almost every pond, lake, slow moving stream, and ditch

becomes the breeding ground for this species of treefrog. On the nights of such choruses, *Hyla regilla* can be observed by the hundreds with the aid of a flashlight. Full scale choruses begin as early as December and still may be heard as late as June. On December 7, 1958, a chorus of hylas was heard at 3:30 P.M. at the junction of Pallett Creek and Big Rock Creek, on the Pearblossom Road about 2 kilometers west of Valyermo. On April 13, 1959, the same locality was revisited, at which time a very large chorus was observed and many specimens were collected.

Locality records (Figure 9)

Los Angeles County
Little Rock Creek just N of the dam (JWK)
Little Rock Canyon, 2.5 miles N Sycamore Camp, 4400 feet (AAS)
Pallett Creek at junction with Big Rock Creek (AAS)
Big Rock Springs (AAS)
From 1.0 mile NW to 1.0 mile SE **Valvermo** (AAS)
Big Rock Creek from **Pearblossom** Road to 2.8 miles S (AAS)
Pearblossom road from Big Rock Creek to Big Pines (AAS)
Soledad Canyon near Long Canyon, Bill's Trout Pond (AAS)
Placerita Canyon 3.0 miles E State Highway 6 (AAS)
Upper Pacoima Creek near Honey Bee Camp, 2200 feet (AAS)
Little Tujunga Canyon 2.2 miles above guard station (AAS)
Big Tujunga Canyon (JWK)
Arroyo Seco, lower canyon (MCL,MBR)
Millard Canyon (LACM)
Eaton Canyon, lower canyon (ECNC)
Bailey Canyon at mouth (MVZ)
Sierra Madre (MVZ)
Baldwin's Lake, Sierra Madre (MVZ)
West Fork San Gabriel River at junction with main fork (AAS)
Amelia Ave. near Glendora Country Club, Glendora (AAS)
West Fork San Dimas Canyon, 2200 feet (KSN)
San Dimas Canyon, 1.0 mile below dam (AAS)
San Dimas Canyon Park (AAS)
1.5 miles NW Claremont (MVZ)
San Antonio Canyon, 4.0 miles S Camp Baldy ranger station (AAS)

Family - Ranidae

11. *Rana aurora* Baird and Girard - Red-legged Frog

The red-legged frog is chiefly an inhabitant of permanent pools, ponds, and marshes of the Pacific slope. These large frogs are not easy to capture because they readily escape into weeds and deep water. **Grinnell** and Camp (1917) state that *Rana aurora* inhabits chiefly the Upper Sonoran Life Zone. This statement is not applicable to the red-legged frog of the San Gabriels because there are very few ponds at elevations above 460 m. Crystal Lake at 1700 m contains red-legged frogs but there are no records from Jackson Lake at 1900 m. In addition to the records of the Pacific slope, *aurora* has been taken at several localities in Soledad Canyon. No red-legged frogs have been collected on the desert slope.

Of the true frogs, *Rana aurora* is the earliest breeder. On January 11, 1958, several were heard calling in the marshy area just

above the Live Oak Canyon Dam. On February 5, 1959, one was heard calling in a pond about two kilometers below the dam in San Dimas Canyon. One year later, on February 3, 1960, *Rana aurora* was heard calling at the same locality. At this later date one subadult was collected. The air temperature was 13°C.

Rana aurora is the largest of the native frogs in the San Gabriels. On February 11, 1959, Paul R. Ennis took two males, both measuring 95 mm in body length, in a pond just north of the junction of the East Fork with the main fork of the San Gabriel River.

Locality records (Figure 10)

Los Angeles County
- Soledad Canyon ± 15.0 miles NNE or NE San Fernando (MVZ)
- 6 miles SE Acton where stream crosses Aliso Canyon Road (LACM)
- Placerita Canyon (Slevin, 1928)
- Upper Pacoima Canyon near Honey Bee Camp (MVZ)
- Big Tujunga Canyon ± 15.0 miles E San Fernando (MVZ)
- Big Tujunga Canyon, 1.7 miles N guard station and 0.5 mile S Vogel Canyon (UCLA)
- Big Tujunga Canyon, 1800 feet (Zweifel, 1955)
- Arroyo Seco (LMK)
- Sierra Madre, 1000 feet (MVZ)
- Santa Anita Wash (Slevin, 1928)
- Monrovia and Spanish Canyon (LACM)
- Crystal Lake (LACM)
- West Fork San Gabriel Canyon at junction with main fork (PRE)
- West Fork San Dimas Canyon (KSN)
- San Dimas Canyon, 1.0 mile below dam (AAS)
- Marsh above Live Oak Canyon dam (AAS)

San Bernardino County
- North Fork Lytle Creek near Glenn Ranch (AAS)

12. *Rana muscosa* Camp - Mountain Yellow-legged Frog

Zweifel (1955) has demonstrated conclusively that *Rana muscosa* and *Rana boylei* are distinct species. In part, the evidence used by Zweifel is the sympatric occurrence of both forms in the North Fork of the San Gabriel River. The actual area of sympatry is just above Bichota Canyon. Zweifel collected both species at this locality on different days. My collections further substantiate the sypatric occurrence of these species. On July 6, 1959, both species were collected at the same locality in Bear Creek at an elevation of 580 m. The habitat was of typical *muscosa* type. The stream at this point was narrow and fast moving with an abundance of large boulders.

The summer of 1959 marked an unusually dry season for southern California. In many areas the usual *muscosa* habitat, a permanent fast running stream, was greatly altered by a lack of water. Many of the more permanent running streams were reduced to a series of deep, still pools at 1350 m in Little Rock Creek. The pools were crowded with trout, garter snakes, and frogs. The entire stream had been reduced, for the most part, to this one strip of pools about 100 meters in length. In order to survive, much of the aquatic life of the area was forced to inhabit the few pools, regardless of their habitat preference. On August 13, 1959, a similar situation was discovered in the Upper Tujunga Creek at 980 m elevation. Eight adults and a number

of *Hyla cadaverina* tadpoles were collected from an essentially identical ecologic situation as had been encountered the previous week at Little Rock Creek, except there was a little more water and the pools were larger and more abundant. In any case, the *muscosa* had been forced to inhabit a habitat that was not normal for the snecies.

Of the true frogs in the San Gabriels, *Rana muscosa* is the most abundant species. It is found in almost every stream on both slopes. During the summer months *muscosa* even outnumbers *Hyla regilla* and *Hyla cadaverina.* However, in the areas of the larger drainages frequented by picnickers and fishermen, the yellow-legged frog is characteristically absent, whereas both hylas may be present.

Rana muscosa usually makes its first appearance for the season in March and activity continues as late as October in some instances. On March 8, 1959, the first adults of the year were collected in Cucamonga Canyon. On February 28, 1960, an adult specimen was collected on the road in San Antonio Canyon. This record marks the earliest that I have collected an adult specimen and the first time that this species has been collected away from a stream. Normally, only juvenile specimens are collected in the winter. The yellow-legged frog breeds from March to May. Tadpoles are most commonly found during June and July in all stages of development.

The females of the species tend to be slightly larger than the males. Of 356 measured specimens, Zweifel (1955) records the largest female at 79.8 mm and the largest male at 67.4 mm. A female collected on August 10, 1959, at 1300 in in Big Rock Creek measured 85 mm in body length. This is the largest specimen of *Rana muscosa* ever recorded.

R. muscosa is relatively easy to capture with a net. Most of the time the frogs can be captured from the large boulders in the streams. If by chance the frogs escape into the water, they will usually elude capture. However, on certain occasions the frogs, upon escaping to the water, will just rest on the bottom of the stream in plain sight and the net can easily be thrust under them so as to complete the capture. No particular care is needed for these underwater captures. The water evidently provides enough security for the frog so as to cancel any alarm which may result from being jostled around by the movement of the net. On one particular occasion the frogs were especially elusive for no apparent reason. On July 28, 1959, at least twenty-five adults were spotted in Etiwanda Canyon, none of which could be approached closely enough to be captured. Numerous tadpoles were collected at this locality, however.

Locality records (Figure 10)

Los Angeles County
- Little Rock Creek, 4400 feet (AAS)
- Little Rock Canyon, 4700 feet (Camp, 1917)
- Pallett Creek, 0.5 mile *NW* Big Rock patrol station (AAS)
- Big Rock Creek, 4200 feet (AAS) (UCLA)
- Big Rock Creek at Isla Hermosa Campgound (UCLA)
- South Fork Big Rock Creek just above South Fork Campground (AAS)
- Big Tujunga Canyon at high bridge of Angeles Forest Highway (UCLA)
- Mill Creek near Big Tujunga Canyon (UCLA)
- Big Tujunga Canyon, 2600 feet (Zweifel, 1955)
- Upper Big Tujunga Canyon, 3150 to 3200 feet (AAS)
- Arroyo Seco near Pasadena, 1300 feet (Camp, 1917)
- Arroyo Seco, 0.1 mile below Waterman guard station (UCLA)

Eaton's Canyon (Slevin, 1928)
Colby Canyon, 3500 feet, Angeles Crest Highway (MCL)
Mount Wilson (Slevin, 1928)
Canyons near Sierra Madre, 1200 to 3000 feet (Camp, 1917)
Little Santa Anita Canyon (Slevin, 1928)
Big Santa Anita Canyon, 1900 and 2800 feet (AAS)
Monrovia Canyon (UCLA)
West Fork San Gabriel River, 2.0 miles E Red Box ranger station (AAS)
West Fork San Gabriel River, 3500 feet (AAS)
West Fork San Gabriel River, 3000 feet (Camp, 1917)
West Fork San Gabriel River, 1.5 miles E Cogswell Dam (AAS)
Devil's Canyon-Bear Canyon Wild Area (AHF)
Bear Creek, 1900 feet (AAS)
North Fork San Gabriel River, 2.25 and 2.75 miles N of West Fork (Zweifel, 1955)
North Fork San Gabriel River ± 0.5 mile N Coldbrook guard station (Zweifel, 1955)
East Fork San Gabriel River from road camp to Allison Gulch (AAS)
East Fork San Gabriel River, 1900 feet, 2000 feet, and 3000 feet at Iron Fork (AAS)
East Fork San Gabriel River at Fish Fork (UCLA)
Vincent Gulch, headwaters East Fork San Gabriel River (MCL)
San Antonio Canyon, 3.0 miles S Camp Baldy ranger station (AAS)

San Bernardino County

Cucamonga Canyon from 0.5 mile above wash to impass at first falls (AAS)
Day Canyon, 2800 to 3000 feet (AAS)
Etiwanda Canyon, 2900 feet (AAS)
Lytle Creek, 2.0 miles S Glenn Ranch (UCLA)

13. *Rana boylei* Baird – Foothill Yellow-legged Frog

In the study area *Rana boylei* is limited in distribution to the San Gabriel River drainage. This limited distribution represents a condition similar to that of *Bufo microscaphus* in the Big Tujunga drainage. In both cases the species may represent relict populations indicative of a once much larger distribution pattern.

Rana boylei in the San Gabriel River is replaced by *Rana muscosa* in the upper portions of the drainage. *R. boylei* is found from 430 m elevation in the main fork to approximately 860 m in the North Fork, 580 m in Bear Creek and 580 in in the East Fork. *R. boylei* has not been captured in the West Fork, but *muscosa* has been captured as low as 640 in in typical *boylei* habitat.

The *boylei* habitat differs from that typical of *muscosa* by having a rather low stream gradient with slow moving water. In addition, the *boylei* habitat is characterized by a considerable number of wide pools with few or no waterfalls and rapids; the stream being considerably wider in the lower areas. Zweifel (1955) states, "The part of the East Fork where *boylei* occurs to the exclusion of *muscosa* is very similar to the lower region of Big Tujunga where *boylei* is not present and *muscosa* occurs sporadically. The inference is that *boylei* is better adapted to the lower gradient stream and replaces *muscosa* in that part of San Gabriel Canyon where a sparse population of *muscosa*, indicative of marginal habitat conditions for that species, might otherwise be expected to occur."

Sympatric occurrences of *boylei* and *muscosa* are not common as has been discussed previously in the section on *Rana muscosa*. Zweifel

(1955) collected both species at 860 m on the North Fork on different days. Anthony J. Gaudin and I collected both species at 580 m in Bear Creek at the same time. Considerable collecting along the East Fork has brought locality records for the two species to within 0.25 kilometer of each other near Camp Bonita (Cattle Canyon).

Zweifel (1955) also discusses the relationship between *Rana aurora* and *Rana muscosa* in Big Tujunga Canyon where the two species have an ecologic relationship similar to that just described for *muscosa* and ***boylei*** in San Gabriel Canyon. This relationship between *aurora* and ***muscosa*** brings to mind a question concerning the relationship between *aurora* and ***boylei.*** It might be assumed that *aurora* and ***boylei*** in the San Gabriels prefer much the same type of habitat, which is true to a certain extent. Both *aurora* and ***boylei*** have been collecte at the same locality at 430 m elevation where the West Fork and East Fork converge to form the main San Gabriel drainage. But for the most part, *aurora* prefers densely shaded pools separated from the main stream course; the main stream course is the preferred habitat for ***boylei.***

Locality records (Figure 10)

Los Angeles County
- Bear Creek, 1.5 miles N of West Fork San Gabriel River, 1900 feet (AAS)
- North Fork San Gabriel River, 0.9 mile above Camp Rincon (UCLA)
- North Fork San Gabriel River, 2.75 miles N of junction with West Fork, 2.0 miles N of junction, 1.25 miles N of junction, 2.5 miles N of junction, and at junction (Zweifel, 1955)
- East Fork San Gabriel River, 1.0 mile E Camp Rincon, 2.5 miles E Camp Rincon, 3.5 to 5.75 miles E Camp Rincon and at Camp Bonita (Zweifel, 1955)

14. *Rana* ***catesbeiana*** Shaw - Bullfrog

This frog is characteristically an introduced pond dweller. It is now found in numerous privately owned trout ponds in the area and in a number of the reservoirs on both slopes of the range, but it is not common. *R. catesbeiana* have been collected in stream situations as well. On August 29, 1959, adults and tadpoles were collected near the lower face of Little Rock Dam. The species has also been collecte in upper Pacoima Creek.

Locality records (Figure 10)

Los Angeles County
- Little Rock Creek just N of the dam (JWK)
- Honey Bee Camp in Upper Pacoima Canyon (MVZ)
- Devil's Gate Dam (LACM)
- San Gabriel Canyon (LACM)
- W rim Crystal Lake (LACM)

Class - REPTILIA

Thirty-six species of reptiles are represented in the San Gabriel Mountains — one turtle, sixteen lizards, and nineteen snakes.

The eventual and highly probable discovery of *Charina bottae* and *Thamnophis sirtalis* in the mountain range would increase the number of snakes by two, making the total number of reptilian species thirty-eight,

Order - TESTUDINATA

Family - Testudinidae

1. Clemmys marmorata (Baird and Girard) - Pacific Pond Turtle

This is the only species of turtle represented in the San Gabriel Mountains. This turtle is not common except locally in canyons having deep pools. It appears to be absent from the streams of the desert slope. It is a common habit of this turtle to sit upon a rock or log close to the water and bask in the sun. If any disturbance occurs, the turtle quickly escapes to the water.

It is possible that the desert tortoise, *Gopherus agassizi,* will eventually be taken along the base of the desert slope in the Joshua tree belt. To date, however, no record for this desert dweller exists in the San Gabriels.

Locality records (Figure 11)

Los Angeles County
Upper Pacoima Creek, 2800 feet (AAS)
Tujunga Canyon (Grinnell and Grinnell, 1907)
Arroyo Seco (Grinnell and Grinnell, 1907)
Millard Canyon above campground, 2200 feet (PHS)
West Fork San Gabriel Canyon 1.8 miles W of Crystal Lake Road (KSN)
Bear Creek, 1900 feet (AAS)
San Gabriel River (Grinnell and Grinnell, 1907)

Order - SQUAMATA

Suborder - SAURIA

Family - Iguanidae

2. Sceloporus occidentalis Baird and Girard - Western Fence Lizard, Blue-bellied Swift

The western fence lizard is probably the most common lizard in the mountain range. It is found in all plant communities. However, in very rocky areas with scant vegetation *Uta stansburiana* tends to exceed *Sceloporus* in population density. *Uta* is especially prevalent on the steep cliffs above roadways; the cliffs have resulted from the cutting of the roadbed from the side of the mountain. Above 1500 m elevation, particularly in the yellow pine belt, *Sceloporus graciosus* is more common than the larger *Sceloporus occidentalis.* However, with regard to total number of individuals inhabiting the mountains, *occidentalis* must be considered the most common.

S. occidentalis is one of the first lizards to become active with the advent of warm weather. These lizards are often found scampering about on warm days in November, December, and January. On October 31, 1958, a *Sceloporus* and a *Uta* were taken in the coastal sage community

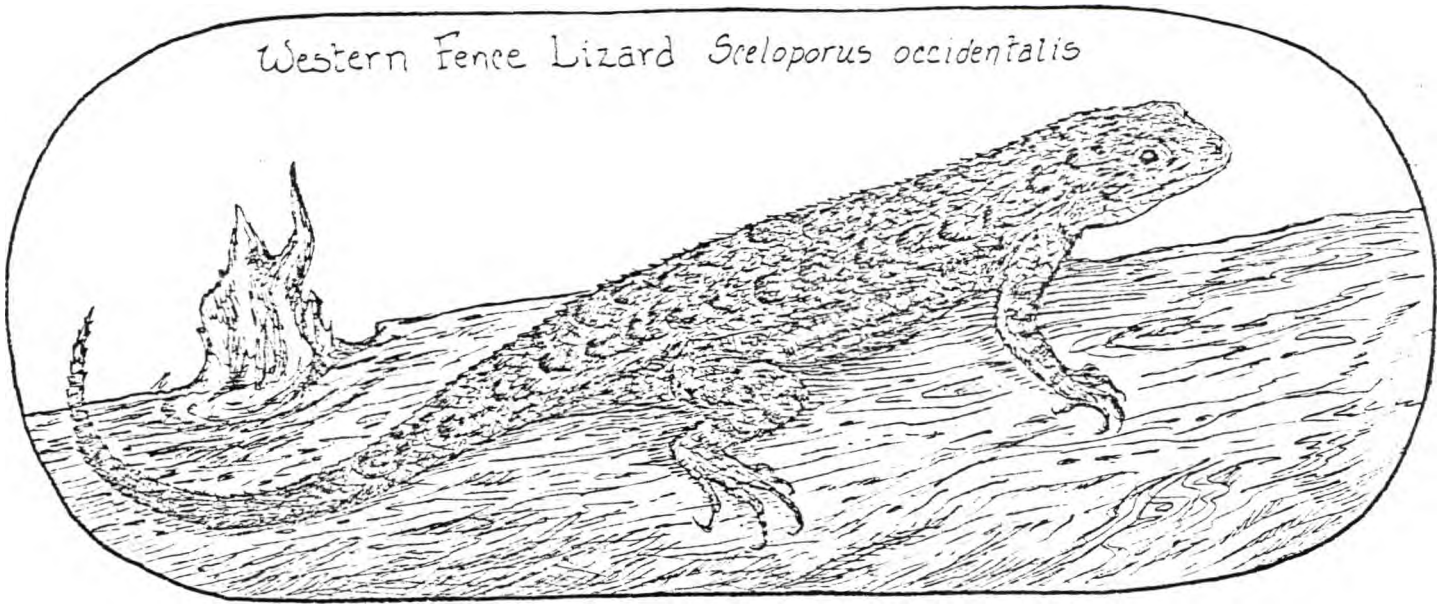
of Thompson Wash. *Sceloporus occidentalis* hibernates under any available cover during the winter. Several individuals may congregate under a single piece of cover if it is the most suitable in the area. Three *Sceloporus* and one Uta were found under a single plank in the Santa Ana Wash near Corona in January of 1958. This Corona locality is not in the San Gabriel range but the record, which is of interest, is cited here. On February 3, 1960, one large adult was found in a torpid condition under a large log in a riparian community approxamately one km downstream from the dam in San Dimas Canyon. The air temperature was 13°C.

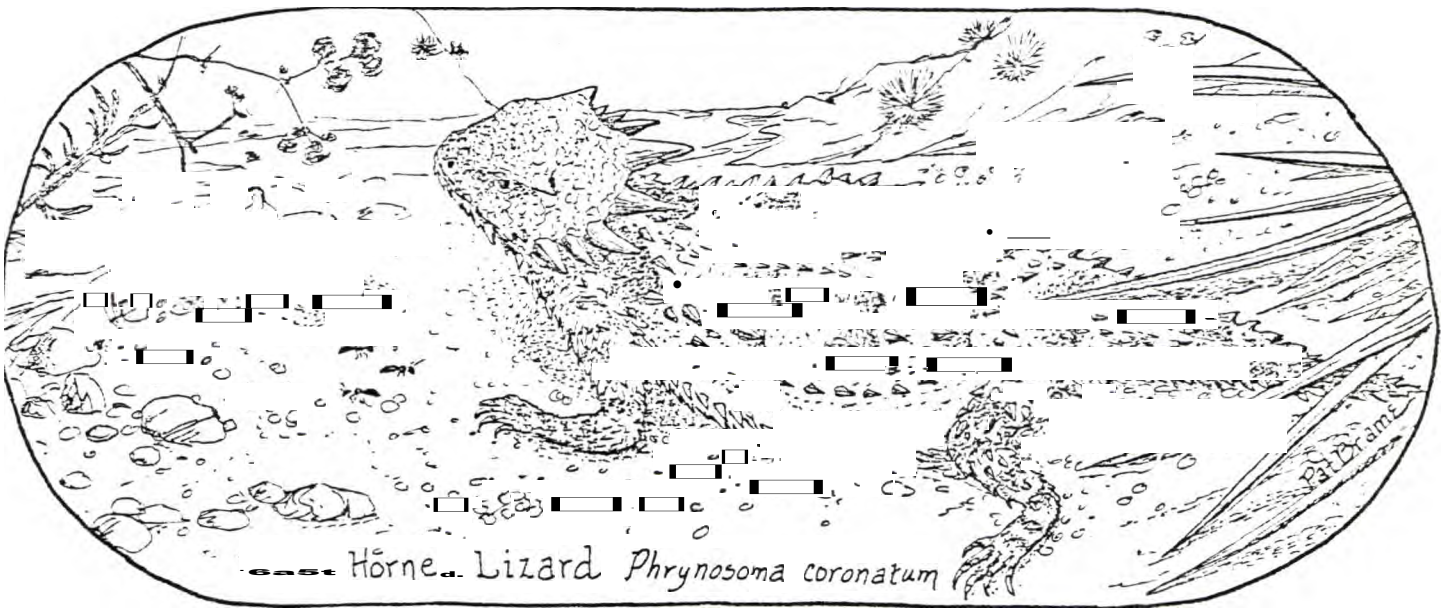
The western fence lizard also appears to be the first lizard to re-inhabit burned over areas. Klauber (1939a) reports a prompt re-occupation of boulders in a fire-swept area a few weeks after the fire occurred. In various areas of the San Gabriels where there have been recent burns, *Sceloporus* is the only lizard in evidence, and at other localities, *Sceloporus* is joined by *Uta*.

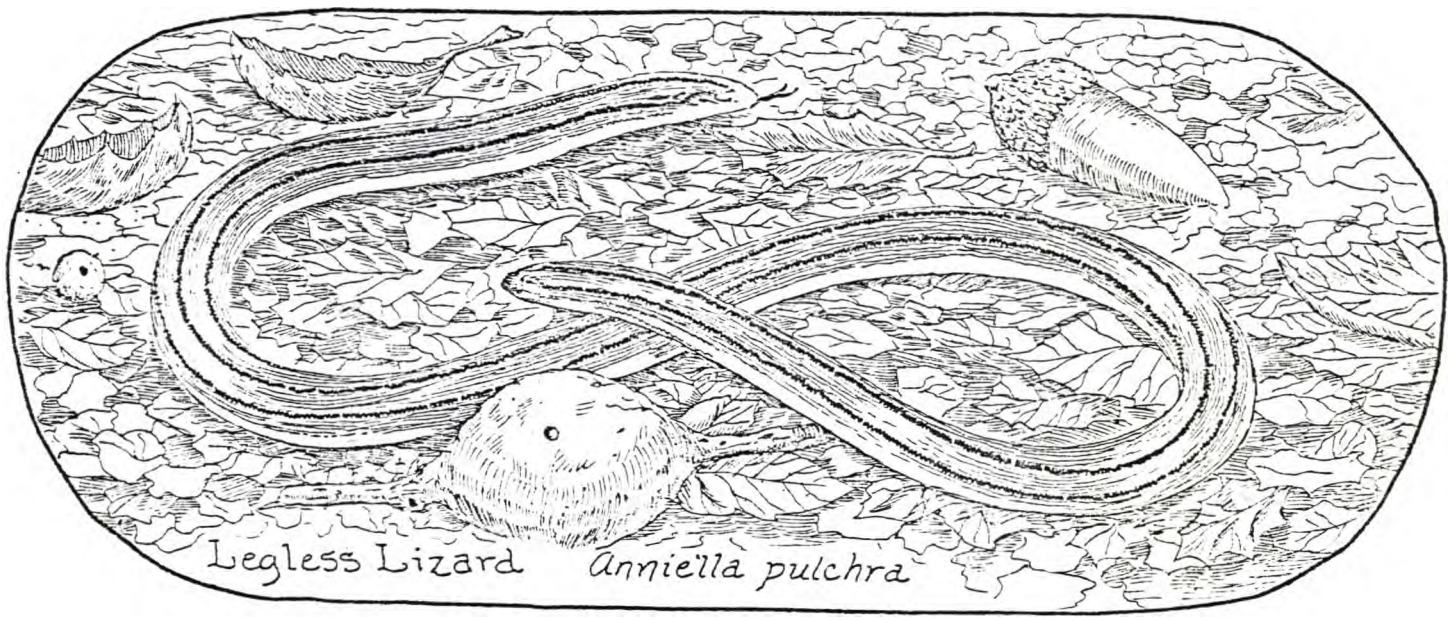
The food of *occidentalis* is usually considered to be primarily insects, including hemipterans, homopterans, and lepidopterous larvae. No reference has been made specifically to dermapterans, but on June 10, 1959, at 1620 m in Charlton Flats, an adult male was seen to devour an earwig that had been uncovered by rolling a log. It is probable that earwigs are eaten by both *occidentalis* and *graciosus* because both species are common in the yellow pine community of Charlton Flats.

Locality records (Figure 12)

Los Angeles County
- One mile N Soledad public camp (LACM)
- Aliso Canyon, 2.5 miles N Soledad Canyon (AAS)
- Road to Santiago Canyon from Angeles Forest Highway, 4400 feet (AAS)
- Pinyon Flats, 5200 feet (AAS)
- Camp Cumorah Crest near Horse Flats (AAS)
- Big Rock Canyon, 5400 feet, 6000 feet, and 1.0 mile N Big Rock Camp (AAS)
- Devil's Punchbowl County Park (MCL)
- Mescal Creek, 4500 to 5000 feet (AAS)
- Swartout near Big Pines (AHF)
- Placerita Canyon, 3.0 and 5.0 miles E State Highway 6 (AAS)
- Upper Pacoima Canyon, 2200 feet (AAS)
- West slope Mendenhall Creek, 3400 feet (AAS)
- Mt. Lukens Trail from Big Tujunga Canyon, 2500 feet (AAS)
- Big Tujunga Canyon (AAS)
- Big Tujunga Canyon 1.0 mile below the dam (AAS)
- Upper Big Tujunga Canyon, 3150 to 3300 feet (AAS)
- Angeles Crest Highway, 0.5 mile above Angeles Crest guard station (AAS)
- Angeles Crest Highway near Barley Flats (AAS)
- Winter Creek, 2800 feet (AHF)
- Eaton Canyon, lower end (MCL)
- Big Santa Anita Canyon, Winter Creek to Camp Sturtevant (AAS)
- West Fork San Gabriel River, 3600 and 3500 feet (AAS)
- Charlton Flats, 3500 feet (AAS)
- Chileno Canyon (AAS)
- Devil's Canyon-Bear Canyon Wild Area (AHF)
- Bear Creek from West Fork San Gabriel River to 1.5 miles N (AAS)
- Soldier Creek between Camp Rincon and Crystal Lake (KSN)


Western Fence Lizard Sceloporus occidentalis


East Horned Lizard Phrynosoma coronatum


Legless Lizard Anniella pulchra

North Fork San Gabriel River, 2500 and 3000 feet (KSN)
East Fork San Gabriel River from road camp to Allison Gulch (AAS)
East Fork San Gabriel Canyon, 2000 feet (AAS)
East Fork San Gabriel River at Iron Fork (AAS)
Vincent Gulch, 6000 feet (AAS)
Vincent Gulch at Prairie Fork San Gabriel River, 4300 feet (AAS)
Camp Grounds in Little Dalton Canyon (ALP)
West Fork San Dimas Canyon (KSN)
San Dimas Canyon, 1.0 mile below the dam (AAS)
San Dimas Canyon, 2.0 miles above the dam (AAS)
Mouth of Thompson Canyon (AAS)

San Bernardino County
Cucamonga Canyon (AAS)
Day Canyon, 2800 to 3000 feet (AAS)
West slope Etiwanda Canyon, 2700 feet (AAS)
Etiwanda Canyon, 2900 feet (AAS)
San Sevaine Canyon, 2150 feet (AAS)
East slope San Sevaine Canyon on Bullock Spur road, 3100 feet (AAS)
San Sevaine Fire Road from Lytle Creek, 3600, 4100 and 4350 feet at Bullock Spur (AAS)
North Fork Lytle Creek near Glenn Ranch (AAS)
North Fork Lytle Creek, 3600 and 5220 feet (AAS)
Middle Fork Lytle Creek (MCL)

3. *Sceloporus graciosus* **Baird and Girard - Sagebrush Lizard**

***Sceloporus graciosus* is common on both slopes of the San Gabriels at elevations above 1500 m where it tends to replace its larger relative, *Sceloporus occidentalis*. Both species are common in some areas such as Charlton Flats, but at elevations greater that 1600 m *graciosus* is far more common than *occidentalis*. *S. graciosus* inhabits three plant communities - portions of upper chaparral, yellow pine, and sagebrush scrub.**

***Graciosus* and *occidentalis* are difficult to tell apart in the preserved state. The scales on the posterior part of the thigh are smooth in *graciosus* and pointed or keeled in *occidentalis*. This character must be observed by use of a microscope and even under magnification identification is not easy. In the field, however, *graciosus* can usually be identified by its smaller size and the presence of a rust colored patch in the axillary region. In general, both *occidentalis* and *graciosus* have the same habits. Both are essentially epigeal but also readily climb rocks or trees. Both species have essentially the same food habits.**

Locality records **(Figure 12)**

Los Angeles County
Tie Canyon, 4600 feet (AAS)
Little Rock Creek, 4 miles S of reservoir (AP)
Valyermo, 3500 feet (AHF)
Big Rock Creek, 5000 feet (AAS)
Big Pines Recreation Area (AAS)
Angeles Crest Highway at Dawson Saddle (AAS)
Blue Ridge near Grassy Hollow Camp (AAS)
Mt. Lowe, 4000 feet (MVZ)
Mt. Wilson, 5300 and 5800 feet (MVZ)
Mt. Wilson Trail, 4150 feet (MVZ)

Monrovia Canyon (MVZ)
Road to Chilao from Mill Creek, 5600 feet, 2.4 miles W of fire camp (AAS)
Charlton Flats, 5300 feet **(AAS)**
Buckhorn (LACM)
Vincent Gulch, headwaters East Fork San Gabriel River (MCL)
Camp Cumorah Crest 0.5 mile NW Angeles Crest Highway on road to Horse Flats (AAS)
Singing Pines Girl Scout Camp near Horse Flats (AAS)
Horse Flats, 5500 feet (MVZ)
Devil's Canyon-Bear Canyon Wild Area (AHF)
Pine Flats, 4000 to 8500 feet (Grinnell and Camp, 1917)
Pine Flats, 6000 feet (MVZ)

San Bernardino County
Summit of Wright Mountain, over 8000 feet (Bogert, 1930)
Cajon Pass (MVZ)
Middle Fork Lytle Creek (MCL)

4. ***Sceloporus magister*** Hallowell - Desert Spiny Lizard

Sceloporus magister has been collected at only four localities in the San Gabriels. The species is probably fairly common in the Joshua tree woodland, particularly in rocky areas. On numerous occasions, what seemed to be excellent *magister* habitat yielded only ***Sceloporus occidentalis.*** One such area is Mescal Wash where numerous specimens of ***Sceloporus*** *occidentalis* and *Uta stansburiana* were collected among the Joshua trees, but no *magister* were even sighted.

Locality records (Figure 12)

Los Angeles County
Mint Canyon (Bogert, 1930)
2.5 miles SSE Little Rock (KSN)
Pearblossom **(LMK)**
Pallett (MVZ)
Valyermo (BB)

5. ***Uta stansburiana*** Baird and Girard - Side-blotched Lizard

Aside from *Sceloporus* ***occidentalis, Uta stansburiana*** is the most common lizard in the mountain range. As has been previously discussed in the section on *Sceloporus* ***occidentalis, Uta*** *is* most common in areas of sparse vegetation, particularly the rocky cliffs adjacent to roadways. ***Uta*** tends to be completely absent in areas of dense chaparral where *Sceloporus* is particularly common. However, both species are ubiquitous with respect to plant communities. ***Uta*** is one of the first lizards to appear from hibernation. Specimens may be collected on wa days during any month of the year. ***Uta*** is similar to *Sceloporus* in many ways. ***Uta*** is diurnal and often may be found basking on rocks. Usually, ***Uta*** is quite wary and quick to retreat when approached, and is thus especially difficult to noose.

Locality records (Figure 13)

Los Angeles County
Aliso Canyon, 2.5 miles S Soledad Canyon (AAS)

Edison Truck Trail, 1.8 miles E Aliso Canyon, 3700 feet (AAS)
Soledad Canyon Pass Drive at end of road, 5000 feet (AAS)
Road to Santiago Canyon from Angeles Forest Highway, 4400 feet (AAS)
Santiago Canyon, 4000 feet (AAS)
Pinyon Flats, 5200 feet (AAS)
Little Rock Reservoir (AP)
2.5 miles SSE Little Rock (KSN)
Devil's Punchbowl County Park (MCL)
South Fork Big Rock Creek above South Fork Campground (AAS)
Big Rock Canyon, 5400 feet (AAS)
Mescal Canyon, 4500 to 5000 feet (AAS)
Soledad Canyon at **Agua** Dulce Canyon cutoff (AAS)
Indian Canyon Public Campground (AAS)
Placerita Canyon, 3.0 miles E State Highway 6 (AAS)
Upper Pacoima Canyon, 2200 feet (AAS)
Lower Little Tujunga Canyon (LACM)
West slope Mendenhall Peak, 3400 feet (AAS)
Haines Canyon (LACM)
Arroyo Seco (Richardson, 1915) - Type locality for *Uta* ***stansburiana hesperis***
Eaton Canyon, lower end (MCL)
Big Santa Anita Canyon from Winter Creek to Camp Sturtevant (AAS)
Big Tujunga Canyon at bridge 1.0 mile below reservoir (AAS)
Upper Big Tujunga Canyon, 3200 to 3300 feet (AAS)
Road to Mill Creek from Chilao, 2.4 miles W fire camp (AAS)
Camp Cumorah Crest and Angeles Crest Christian Camp near Horse Flats (AAS)
West Fork San Gabriel River, 3500 feet (AAS)
West Fork San Gabriel River, 4.2 miles W of junction with North Fork (KSN)
Chileno Canyon (AAS)
Bear Creek from West Fork San Gabriel River to 1.5 miles N (AAS)
Soldier Creek on road to Crystal Lake (KSN)
North Fork San Gabriel River, 2500 feet (KSN)
San Gabriel Canyon at Camp Rincon (KSN)
East Fork San Gabriel Canyon from road camp to Allison Gulch (AAS)
East Fork San Gabriel Canyon, 2000 feet (AAS)
East Fork San Gabriel River at Iron Fork (AAS)
Vincent Gulch at Prairie Fork San Gabriel River, 4300 feet (AAS)
West Fork San Dimas Canyon (KSN)
Mouth of Thompson Canyon (AAS)

San Bernardino County

State Highway 138, 1.0 mile W of Cajon junction (AAS)
Cucamonga Canyon Wash (AAS)
West slope Etiwanda Canyon, 2700 feet (AAS)
East slope of San Sevaine Canyon on Bullock Spur road, 3100 feet (AAS)
San Sevaine Fire Road from Lytle Creek, 4100 feet (AAS)
North Fork of Lytle Creek, 3600 and 5220 feet (AAS)
Middle Fork Lytle Creek (MCL)

6. *Callisaurus* ***draconoides*** Blainville - Zebra-tailed Lizard

Callisaurus is not a common lizard in the San Gabriels. The lizard occupies primarily loose sand areas in canyon bottoms and washes of the desert slope. The species is found in the Joshua tree and lower **juniper** plant communities. Specimens have been taken at elevations as high as 1280 m in Big Rock Creek. Bogert (1930) states that

these lizards are found in many desert gulches up into the Upper Sonoran Life Zone. One record for Cajon Wash places the lizard on the Pacific slope. Numerous trips to Cajon Wash have failed to yield further specimens.

Locality records (Figure 13)

Los Angeles County
  Little Rock Dam (MVZ)
  Little Rock Canyon at Little Rock Camp, 3390 feet (AAS)
  2.5 miles SSE Little Rock (KSN)
  Pearblossom (MVZ)
  (Big) Rock Creek, 4150 feet (MVZ)
  4.5 miles NE Shoemaker, 3750 feet (MVZ)
  Mescal Gulch (Bogert, 1930)
San Bernardino County
  Cajon Wash (MVZ)

7. *Phrynosoma coronatum* (Blainville) - Coast Horned Lizard

Two subspecies of the horned lizard are represented in the San Gabriels. *Phrynosoma coronatum* ***blainvillei*** is the form occurring in most of the mountains, but *frontale* intergrades with *blainvillei* in the northwestern portion of the range.

This horned lizard is found essentially in arid or semi-arid areas, coastal sage, chaparral, and sagebrush scrub. It is completely absent from oak woodland and riparian plant communities. Specimens have been recorded in pinyon, juniper, and as high as 1900 m in the yellow pine community at Big Pines.

The period of greatest activity for this species is in May and June, but adult specimens may be collected as late as August and September. Newly hatched juveniles are very common in late August. On August 12, 1959, a number of juveniles were collected, the smallest of which measured 21 mm in snout-vent length and 30 mm in total length. These specimens were found in the soft dust on a dirt road at 980 m in the chaparral of the upper Big Tujunga River. On August 17, 1959, a young camper at Camp Cumorah Crest brought me a juvenile *Phrynosoma* which measured 30 mm in snout-vent length. Camp Cumorah Crest is at 1800 m elevation, 0.5 km northwest of the Angeles Crest Highway on the road to Horse Flats. These specimens were probably the first hatchlings of the year. The largest specimen from the San Gabriels measured 100 mm in snout-vent length and 140 mm in total length.

It is a common habit of the horned lizard to rely on its protective coloration and body shape to prevent predation. On several occasions I have almost stepped on them as they lay in the soft dust of a dirt road. The flattened body of the horned lizard is particularly advantageous for concealment. The lizard can press itself against the substrate and there-by cast no shadow; a feature that coupled with excellent protective coloration serves to make them very difficult to see.

Generally, specimens from the two slopes differ somewhat in color Specimens from the desert slope tend to have a dark yellow ventral surface and those from the Pacific slope are usually white ventrally.

Locality records (Figure 14)

Los Angeles County
- Near Little Rock (Bogert, 1930)
- Little Rock Reservoir (LACM)
- ± 2.0 miles SE Valyermo Ranger Station (MVZ)
- Devil's Punchbowl (Bogert, 1930)
- 1.0 mile NW Valyermo (Reeve, 1952)
- Big Rock Creek, 4300 feet (MVZ)
- South Fork Big Rock Creek just above campground (AAS)
- Fenner Canyon near Big Rock Camp (AAS)
- Dirt Road to Boulder Canyon, 2.5 miles N Mile High (RGM)
- Ball Flat Road 1.0 mile N County road station **(RGM)**
- Big Pines Recreation Area, Camp McKiwanis at head of Mescal Gulch (AAS)
- Big Pines Recreation Area, Camp Terrisita Pines at 6100 feet and Camp Junipero Serra at 6200 feet (AAS)
- Lower Mescal Gulch (Bogert, 1930)
- Mescal Gulch (Reeve, 1952)
- Soledad Canyon, 6.0 miles WSW Acton (AHF)
- **Placerita** Canyon (LACM)
- NW slope Mendenhall Peak above Pacoima Canyon, 3400 feet (AAS)
- 3 and 5 miles N Little Tujunga Ranger Station (LACM)
- Tujunga Wash (MVZ)
- Mt. Lukens trail from Big Tujunga Canyon, 2500 feet (AAS)
- Upper Big Tujunga Canyon, 3200 feet (AAS)
- Upper Tujunga, 4500 feet (Grinnell and Camp, 1917)
- Upper Tujunga, 5000 to 5500 feet (Camp, 1917)
- La Crescenta (Reeve, 1952)
- Eaton Canyon (ECNC)
- Pasadena (MVZ)
- **Alhambra** (Reeve, 1952)
- Barley Flats (Camp, 1917)
- Top of Mt. Wilson (MVZ)
- Sierra Madre (MVZ)
- 0.5 mile W Santa Anita Canyon (MVZ)
- Camp Cumorah Crest near Horse Flats (AAS)
- Devil's Canyon-Bear Canyon Wild Area (AHF)
- 1.0 mile N Azusa (Reeve, 1952)
- San Gabriel River near Azusa (MVZ)
- Pine Flats (Camp, 1917)
- East Fork San Gabriel River, 2 miles E Camp Rincon (LACM)
- East Fork San Gabriel River, 2000 feet (AAS)
- Thompson Creek, 1.5 miles NW Claremont (MVZ)
- Thompson Creek Wash, 1360 feet (LCW)

San Bernardino County
- Swartout Canyon (Reeve, 1952)
- Sheep Creek, 4600 feet (MVZ)
- Cajon Pass (Grinnell and Camp, 1917)
- West slope Etiwanda Canyon, 2700 feet (AAS)
- East slope San Sevaine Canyon on Bullock Spur road, 3200 feet (AAS)
- Lytle Creek (Reeve, 1952)

8. *Phrynosoma platyrhinos* Girard - Desert Horned Lizard

Phrynosoma coronatum is replaced on the desert flats by *Phrynosoma platyrhinos.* It is doubtful that the range of the desert horned lizard

extends to more than 1100 m elevation into the mountains, but due to the possibility of sympatry with *coronatum* in the Joshua tree belt, *platyrhinos* is included here. Johnson, Bryant, and Miller (1948) report *Phrynosoma platyrhinos* at elevations up to 1400 m in the Joshu tree community of the Providence Mountains, which indicates that records at similar elevations in the San Gabriels are possible. Boge (1930) reports *platyrhinos* and *coronatum* from within five km of each other near Little Rock. A collection on April 15, 1973 by Michael Lo of Whittier Narrows Nature Center places these desert lizards on the Pacific slope in Soledad Canyon in possible sympatry with *coronatum.* Apparently this and other desert lizards such as *Callisaurus draconoides* follow these low elevation canyons from the desert to the Paci slope.

Locality records (Figure 14)

Los Angeles County
Soledad Canyon, near Soledad Campground (MCL,MBR)
Near Little Rock (Bogert, 1930)
4.0 miles SE Pearblossom (Reeve, 1952)
10.0 miles E Llano (Reeve, 1952)

9. *Crotaphytus collaris* (Say) - Collared Lizard

Collared lizards cannot actually be assigned to a particular plant community because the habitat where the lizards are found contains very little vegetation. These lizards are found only in the unshaded canyon bottoms and dry rocky stream beds up to 1700 m on both slopes of the mountains. The collared lizard habitat actually cuts through four plant communities – chaparral, juniper, pinyon, and sagebrush scrub to some extent – but the lizards are absent from the plant communities through which the stream beds pass.

On July 31, 1959, four collared lizards were collected in a dry, rocky stream bed at 1600 m in the North Fork of Lytle Creek. On August 25, 1959, two females were collected in a similar habitat at 1320 m in Vincent Gulch. Dr. Kenneth S. Norris reports that on May 3, 1947, he collected three collared lizards at 850 m in the East Fork of the San Gabriel River, about 2.5 km downstream from the Vincent Gulch locality. They also have been taken in San Antonio Canyon, about 1 km south of Mt. Baldy Village. These localities appear to be the only records for the collared lizard on the Pacific coast drainage. In California, the collared lizard is usually considered to be a desert dweller. However, the dry, rocky stream habitat is essentially the same on both slopes and suitable habitats are available for the species on either slope of the mountain range. On the desert slope *Crotaphytus collaris* ranges west as far as Little Rock Creek.

The young do not appear until the latter part of August when the adults are not numerous. On September 1, 1959, two juveniles were collected at 1440 m in Mescal Gulch. No adults were sighted. The smaller of these two juveniles was probably only a day or so old; it measured only 43 mm in snout-vent length and 125 mm in total length The largest specimen collected in the San Gabriels was a male from the North Fork of Lytle Creek that measured 117 mm in snout-vent length and 305 mm (12 inches) in total length.

Locality records (Figure 15)

Los Angeles County
  Little Rock Reservoir, just below dam, 3200 feet (AP)
  Little Rock Creek, 2 to 4 miles S of Reservoir (AP)
  Valyermo (UCLA)
  Devil's Punchbowl (Bogert, 1930)
  2.3 miles N Valyermo (UCLA)
  Big Rock Creek, 4200 feet (AAS)
  South Fork Big Rock Creek near campground (AAS)
  Big Rock Creek at mouth of Dorr Canyon (UCLA)
  Mescal Creek, 4700 and 5000 feet (AAS)
  Vincent Gulch at Prairie Fork of San Gabriel River, 4300 feet (AAS)
  Vincent Gulch, about 5000 and 5400 feet (MCL,MBR)
  East Fork San Gabriel River, 2780 feet (KSN)
San Bernardino County
  Lone Pine Canyon near Clyde Ranch, 4900 feet (SBCM)
  San Antonio Canyon, 1/4 to 3/4 mile S Mt. Baldy Village (GRS)
  Middle Fork Lytle Creek, 5000 feet (MCL)
  North Fork Lytle Creek, 5220 feet (AAS)
  North Fork Lytle Creek, 4000 feet (SDMNH)

*10. Crotaphytus **wislizenii*** Baird and Girard - Leopard Lizard

Leopard lizards are found on the desert slope at elevations up to 1480 m. They are encountered chiefly on the upper parts of the alluvial fans where the terrain is gently sloping, the soil is sandy and the vegetation consists mainly of isolated shrubs. These lizards are frequently seen about the bases of junipers or running across the intervening openings in the Joshua tree community. On August 17, 1959, one was taken from the fireplace of a collapsed shack at 1400 m in the Joshua tree belt of Mescal Gulch. This specimen died in captivity after swallowing a *Sceloporus **occidentalis*** almost equal to it is size. It died with the tail of the *Sceloporus* still extending 3 cm from its mouth.

Bogert (1930) reports the presence of the leopard lizard in Mint Canyon on the Pacific slope. Mint Canyon is not actually in the San Gabriels, but the locality records for this canyon are noteworthy because the canyon both begins and ends at Soledad Canyon, the northwest boundary of the San Gabriel range.

Locality records (Figure 15)

Los Angeles County
  Little Rock Creek, S of reservoir (MCL)
  2.0 miles W Pallett (Grinnell and Camp, 1917)
  Pallett, 4000 feet (MVZ)
  Mescal Canyon, 4600 feet (AAS)
  Small Canyon, 1.0 mile S of Desert Springs, 4800 feet (AAS)
  Mint Canyon on Pacific slope (Bogert, 1930)

Family - Gekkonidae

11. Coleonyx variegatus (Baird) - Banded Gecko

There are only two known records for the gecko in the San Gabriel

Mountains, both for the extreme northwestern portion of the range in the Joshua tree habitat. These records seem to mark the southeastern limits of a small but widespread population of geckos distributed alon the base of the hills south of Fairmont in the Antelope Valley.

Locality *records* (Figure 16)

Los Angeles County
  2.5 miles NE Vincent (Klauber, 1945)
  Littlerock (Klauber, 1945)

Family - Xantusiidae

12. ***Xantusia*** *vigilis* Baird - Yucca Night Lizard

Xantusia is a common inhabitant of the Joshua tree belt. To some extent, the species inhabits the juniper community as well. These lizards are most commonly found under decaying limbs of fallen Joshua trees. However, specimens are also taken from under rocks, boards and woodrat nests. Bogert (1930) erroneously states that these lizard are only in the vicinity of Joshua trees. James L. Vial has reported collecting specimens of *Xantusia* from under *Yucca* ***whipplei*** in the juniper plant community just north of the campground in the South Fork of Big Rock Creek. This locality, at 1380 m elevation, is at least five km from the closest Joshua trees. On August 18, 1959, *Xantusia* were collected in a small valley at the eastern end of Soledad Canyon Pass Drive at an elevation of 1540 m. The valley is unique in that it harbors a large grove of Joshua trees. Under the fallen and decaying limbs of the Joshua trees eleven specimens of *Xantusia vigilis* were found. The Joshua grove is completely surrounded by the adjacent juni per covered hills. The large size of the Joshua trees indicates that the grove is not young and the nearest Joshua trees are at least 12 km away. It was, therefore, concluded that either the night lizards re- present an isolated population or they entered the valley by way of the juniper woodland. The latter conclusion seems more logical since *Xantusia* has been collected previously in juniper woodland.

Locality *records* (Figure 16)

Los Angeles County
  Vasquez Rocks County Park, along Escondido Creek, 2440 feet (DEH)
  Eastern end of Soledad Canyon Pass Drive above Folding Hills
    Ranch, 5000 feet (AAS)
  Pallett (MVZ)
  South Fork Big Rock Creek just below campground, 4500 feet (JLV)
  Devil's Punchbowl County Park, 4780 feet (PHS)
  Mescal Canyon, 4600 feet (AAS)
San Bernardino County
  Lone Pine Canyon **(LMK)**

Family - Teiidae

13. Cnemidophorus tigris Baird and Girard - Western Whiptail, Western Racerunner

This is the third most common lizard in the San Gabriels. It is

exceeded in number by *Sceloporus occidentalis* and *Uta stansburiana*. *Cnemidophorus* is common on both slopes from the base of the mountains to 1700 m and is found in all habitats except yellow pine forest. No specimens have been recorded from oak woodland, but specimens have been taken in the riparian community on several occasions so the species is probably in the oak woodland as well.

These diurnal lizards are most active during the morning hours, when they may be seen singly or in pairs foraging about in rocks and brush. Pequegnat (1951) states that in the Santa Ana Mountains these lizards are seldom seen during late June, July and early August; their most active periods occurring in early and late summer. Midsummer inactivity was not observed in the San Gabriels. Whiptail lizards first appear in April and May and increase their activity until June. They seem to be abundant and active all summer. The number of active individuals tapers off in September and activity ceases altogether in October.

The most striking habit of the whiptail is its incessant activity. It moves through the undergrowth, foraging and seeking out food, its head constantly bobbing. It even climbs into the branches of bushes in search of food. This constant activity, plus the absence of a neck constriction, makes this lizard exceedingly difficult to noose. Most of the time the specimens must be shot if they are to be captured.

The *Cnemidophorus* of the desert slope have been assigned to a different subspecies than those from the Pacific slope. *Cnemidophorus tigris tigris* is the name applied to the form from the desert slope and *Cnemidophorus tigris multiscutatus* is the name applied to the coastal slope race. The only difference that can be observed between the specimens of the two slopes is that those from the Pacific slope tend to have orange or pink throats more frequently than those from the desert slope.

Locality records (Figure 16)

Los Angeles County
- Aliso Canyon, 2.5 miles S Soledad Canyon (AAS)
- Edison Truck Trail, 1.8 miles E Aliso Canyon, 3700 feet (AAS)
- E end of Soledad Canyon Pass Drive above Folding Hills Ranch, 5000 feet (AAS)
- Road to Santiago Canyon, 2.5 miles E Angeles Forest Highway, 4400 feet (AAS)
- Little Rock Reservoir (LACM)
- Little Rock Canyon, 4800 feet (AAS)
- Pallett Creek, 0.5 mile N Big Rock Patrol Station (AAS)
- Devil's Punchbowl (Bogert, 1930)
- Pallett (Burt, 1931)
- Trail to South Fork Campground from Big Rock Creek (JLV)
- Big Rock Canyon, 5400 feet (AAS)
- Big Rock Creek, 5500 feet (KSN)
- Ball Flat (AAS)
- Mescal Creek, 4500 to 5000 feet (AAS)
- **Placerita** Canyon, 3.0 miles E State Highway 6 (AAS)
- Upper Pacoima Canyon, 2200 feet (AAS)
- Tujunga Wash (Grinnell and Grinnell, 1907)
- Mt. Lukens Trail from Big Tujunga Canyon, 2500 to 3000 feet (AAS)
- Upper Big Tujunga Canyon, 3150 to 3300 feet (AAS)
- Arroyo Seco Wash (Grinnell and Grinnell, 1907)
- Arroyo Seco above Switzer's Camp, 3500 feet (Grinnell and **Grinnell**,1907)
- Pasadena (Burt, 1931)

Angeles Crest Highway, 2.0 miles W Palmdale turnoff, 3700 feet (AAS)
Angeles Crest Highway at Palmdale turnoff (AAS)
Angeles Crest Highway, 1.0 mile W to 5.0 miles E Mt. Wilson turnoff (AAS)
West Fork Mt. Wilson (LACM)
Sierra Madre (Burt, 1931)
Big Santa Anita Canyon from Winter Creek to Sturtevant Camp (AAS)
Chilao (AHF)
Chileno Canyon (AAS)
Bear Creek from West Fork San Gabriel River to 1.5 miles N (AAS)
West Fork San Gabriel River at Rincon guard station (AAS)
San Gabriel Wash (Grinnell and Grinnell, 1907)
East Fork San Gabriel River from road camp to Allison Gulch (AAS)
East Fork San Gabriel River, 2000 feet (AAS)
East Fork San Gabriel River at Iron Fork and Prairie Fork (AAS)
Vincent Gulch near Angeles Crest Highway (MCL)
Little Dalton Canyon at campgrounds (ALP)
Claremont (Burt, 1931)

San Bernardino County
W slope Etiwanda Canyon, 2700 feet (AAS)
San Sevaine Canyon, 2150 feet (AAS)
E slope San Sevaine Canyon on Bullock Spur road, 3100 feet (AAS)
San Sevaine fire road from Lytle Creek, 4100 feet (AAS)
North Fork Lytle Creek, 3600 and 5220 feet (AAS)
Middle Fork Lytle Creek (MCL)
Cajon Wash (Burt, 1931)

Family - Scincidae

14. *Eumeces skiltonianus* (Baird and Girard) - Western Skink, Blue-tailed Skink

The western skink is found principally in the yellow pine forest, but is also found to a lesser extent in the chaparral, riparian, oak woodland and sagebrush scrub plant communities.

The period of major seasonal activity is from March to June. No specimens were collected in the San Gabriels in August and only two were collected in July; both in the yellow pine forest. The skink spends most of its time under logs and bark, and comes out during the last hours of daylight to forage. The skinks are rather fast lizards. When one of these lizards runs from one spot to another, the brillian blue flash of the tail is usually all that is seen.

The best collection technique is to roll rocks and logs. Upon uncovering a specimen, the collector must move quickly in order to secure the capture. A noose is not effective because skinks are very wary and seldom allow themselves to be approached within noosing distance. In addition, *Eumeces* like *Cnemidophorus* lacks a neck constric tion about which to secure the noose. Shooting specimens is undesirable because the bony plates on the head and body tend to shatter upo being struck by the lead shot.

Locality records (Figure 17)

Los Angeles County
Little Rock Creek at Sycamore Campground, 3900 feet (MCL)
Camp Hemohme, Big Pines Recreation Area (AAS)
Blue Ridge, 7000 feet (AAS)

Placerita Canyon (FH)
Indian Canyon near public campground (AAS)
Upper Pacoima Canyon near Honey Bee Camp (AS)
Big Tujunga Canyon (LACM)
La Crescenta (Rodgers and Fitch, 1947)
Brown's Canyon (LACM)
Whitney Canyon, 3 miles E Newhall (LACM)
Arroyo Seco near Pasadena (Rodgers and Fitch, 1947)
Waterman Canyon (Rodgers and Fitch, 1947)
Foothills near Pasadena (Rodgers and Fitch, 1947)
8.0 miles NE Pasadena (Rodgers and Fitch, 1947)
Mouth of Bailey Canyon (Rodgers and Fitch, 1947)
Bailey Canyon near Sierra Madre (MVZ)
Sierra Madre, 2500 feet (Rodgers and Fitch, 1947)
Barley Flats, 5500 feet (Grinnell and Camp, 1917)
Barley Flat, 6000 feet (Rodgers and Fitch, 1947)
Singing Pines Girl Scout Camp near Horse Flat, 5500 feet (AAS)
Chilao (AHF)
Devil's Canyon-Bear Canyon Wild Area (AHF)
Vicinity of Claremont (Cowles, 1926)
San Bernardino County
Swartout (Rodgers and Fitch, 1947)

15. ***Eumeces gilberti*** Van Denburgh - Gilbert's Skink, Red-tailed Skink

Eumeces gilberti is rare in the San Gabriel Mountains. Only three specimens have been recorded for the area. The habitat preferences in the San Gabriel range appear to be riparian and oak woodland. In other parts of southern California, *gilberti* is found in the oak savannah. The absence of this plant community from the San Gabriel Mountains is probably one of the primary factors responsible for the rarity of the red-tailed skink.

Locality records (Figure 17)

Los Angeles County
3 miles N Little Rock Reservoir (LACM)
Mt. Wilson (Rodgers and Fitch, 1947)
San Bernardino County
Lytle Creek, 14.0 miles WNW San Bernardino (Rodgers and Fitch, 1947)

Family - Anguidae

16. Gerrhonotus ***multicarinatus*** (Blainville) - Alligator Lizard

Gerrhonotus multicarinatus, known locally as the snake lizard, is fairly common under rocks and logs in the yellow pine, oak woodland, and riparian plant communities. To a lesser extent, the chaparral is also inhabited by this lizard. On August 17, 1959, a ***Gerrhonotus*** was collected in the Joshua tree community at the mouth of Mescal Canyon, 1400 m in elevation. The specimen was taken from under a board near a fallen shack. This locality record may indicate the occasional occurrence of this lizard in the arid juniper and Joshua tree woodlands. However, the riparian community of Mescal Creek is but one kilometer south of this arid locality. This specimen may have wandered that far

out of its element in search of food.

The normal period of activity is from March through September. However, at lower elevations, particularly near habitation, the alligator lizard may be active all year around.

An interesting red-backed population of alligator lizards inhabits the yellow pine forest at 1900 m elevation in the Big Pines Recreation Area. All the specimens from this area, mostly from the vicinity of Camp Junipero Serra, are characterized by having a bright red dorsal surface as opposed to the brown color normally found in th San Gabriels. No brown-backed specimens were collected in the area. The specimens keyed out to *Gerrhonotus multicarinatus webbi,* the subspecies inhabiting the rest of the mountain range. The red-backed trait is probably a genetic expression of a mutational nature that ha become locally established. Red-backed *webbi* are frequently collecte in San Diego County in the southern portion of the known geographic range, but they are seldom reported as far north as the San Gabriel range.

Locality records (Figure 18)

Los Angeles County
- Big Rock Patrol Station (AAS)
- Big Rock Creek, 4300 feet (MVZ)
- Big Pines Recreation Area, Camp Junipero Serra and Camp Terrisita Pines (AAS)
- Mescal Canyon, 4600 feet (AAS)
- Swartout near Big Pines (AHF)
- Placerita Canyon (FH)
- Whitney Canyon, 3 miles E Newhall (LACM)
- Mt. Lukens Trail from Big Tujunga Canyon, 2500 feet (AAS)
- Upper Big Tujunga Canyon, 3150 feet (AAS)
- Upper Big Tujunga Canyon, 5000 feet (MVZ)
- Arroyo Seco near Pasadena (MVZ)
- Millard Canyon, 1.0 mile N Arroyo Seco (MCL,MBR)
- Eaton Canyon County Park (ECNC)
- Bailey Canyon, Sierra Madre (MVZ)
- Mouth of Monrovia Canyon (AAS)
- Monrovia Canyon Park, 1.5 miles NW Monrovia (MVZ)
- Camp Cumorah Crest near Horse Flats (AAS)
- Devil's Canyon-Bear Canyon Wild Area (AHF)
- Pine Flats, 5500 feet (MVZ)
- Bear Creek, 1850 feet (AAS)
- West Fork San Gabriel River, 0.8 mile E Red Box Ranger Station (AAS)
- East Fork San Gabriel River (AHF)
- Vincent Gulch Trail on E slope Mt. Baden-Powell (AAS)
- 0.5 mile below Big Dalton turnoff just above Glendora (ALP)
- 1.5 miles NW Claremont (MVZ)

San Bernardino County
- Sheep Creek (MVZ)
- North Fork Lytle Creek, 100 yds. below Lytle Creek P.O. turnoff (AAS
- Middle Fork Lytle Creek, Stone House Campground (MCL)

Family - Anniellidae

17. *Anniella* pulchra Gray - Legless Lizard

Anniella is found along the Pacific slope of the mountain range

and inhabits riparian, oak woodland, and upper alluvial fans of the coastal sage scrub. The lizard is not common in these habitats except for occasional local populations.

Soil type is the most important ecological limiting factor for this lizard. The soil has to be sandy because this almost entirely fossorial lizard is unable to subsist in hard soil. In addition, finely textured sand is preferred to a more coarse grained type. In some areas, such as the oak woodland community, sandy loam and leaf litter is preferred. Mr. Loefler, the caretaker at Dexter Park in Kagel Canyon, reports these lizards to be fairly common each spring in the moist leaf litter of the oak woodland in that area. Humidity appears to be another important ecological limiting factor. The species is never collected in dry soil.

The coastal sage habitat in Thompson Wash, 2 km northwest of Claremont, is discussed by Miller (1944). Here the earth is hard except for local areas under bushes where leaf litter has accumulated. It is in this area of leafy refuse that Hilton reports *Anniella pulchra* to be common but not abundant. Stebbins (1954) erroneously refers to this coastal sage scrub habitat in Thompson Wash as chaparral.

Locality records (Figure 18)

Los Angeles County
- **Placerita** Canyon (FH)
- Soledad Canyon, 6.0 miles WSW Acton (AHF)
- Upper Pacoima Canyon near Honey Bee **Camp** (AS)
- Dexter Park in Kagel Canyon **(JWK)** - collected by Mr. Loefler, the caretaker.
- Tujunga Wash (Bogert, 1930)
- La Canada (Grinnell and Grinnell, 1907)
- Arroyo Seco near Pasadena **(Grinnell** and Grinnell, 1907)
- **Pasadena** and near Pasadena (MVZ)
- Mouth of Eaton Canyon, 3.0 miles E Altadena (MVZ)
- Thompson Wash, 1.5 miles NW Claremont (Miller, 1944)

Suborder - SERPENTES

Family - Leptotyphlopidae

18. ***Leptotyphlops humilis*** (Baird and Girard) - Western Worm Snake

The worm snake is rare in the San Gabriel Mountains, but probably not as rare as the records would indicate. There is but one published record for the snake in the San Gabriel Range and only four records for the entire Los Angeles County. The single San Gabriel specimen was taken from the chaparral community in Big Dalton Canyon. Further records may reveal the presence of the species on the desert slope as well.

Locality records (Figure 19)

Los Angeles County
- Dalton Canyon (Klauber, 1940b)

Family - Boidae

19. Lichanura trivirgata Cope - California Boa, Rosy Boa

The California boa is rarely encountered. It prefers the lower part of the chaparral plant community to the coastal sage scrub, but it is found in both. The species has never been collected on the desert slope, but it may occur there in the Joshua tree and juniper woodlands.

Specimens collected in the daytime are usually taken in the late afternoon or on an overcast day. Grinnell and Grinnell (1907) report the collection of a California boa at the mouth of San Gabriel Canyon in a driving rain. Joseph V. Linder of the San Dimas Experimental Station reports the collection of a specimen at 12:00 noon on an overcast day, 2.5 km east of Tanbark Flats. This snake, taken alive on the road, is the largest specimen recorded from the San Gabriels. It measured 890 mm (35 inches) in total length.

Locality records (Figure 19)

Los Angeles County
- Placerita Canyon (CF)
- Tujunga Canyon (Klauber, 1931)
- Arroyo Seco (Klauber, 1931)
- Millard's Canyon, 4000 feet (UCLA)
- Altadena (LACM)
- Eaton Canyon (Grinnell and Grinnell, 1907)
- Eaton Wash near Pasadena (MVZ)
- Mt. Wilson (Klauber, 1931)
- Mt. Wilson Trail (Bogert, 1930)
- Sierra Madre, 1700, 1900, and 2500 feet (MVZ)
- San Gabriel Wash near Azusa (MVZ)
- Mouth of San Gabriel Canyon (Grinnell and Grinnell, 1907)
- Mouth of Fish Canyon (Grinnell and Grinnell, 1907)
- North Fork San Gabriel Canyon, 3500 feet (AAS)
- Glendora Mt. Road near Colbies Fire Truck Trail (JVL)
- 2.0 miles E Tanbark Flat (JVL)
- Vicinity of Claremont (Cowles, 1926)

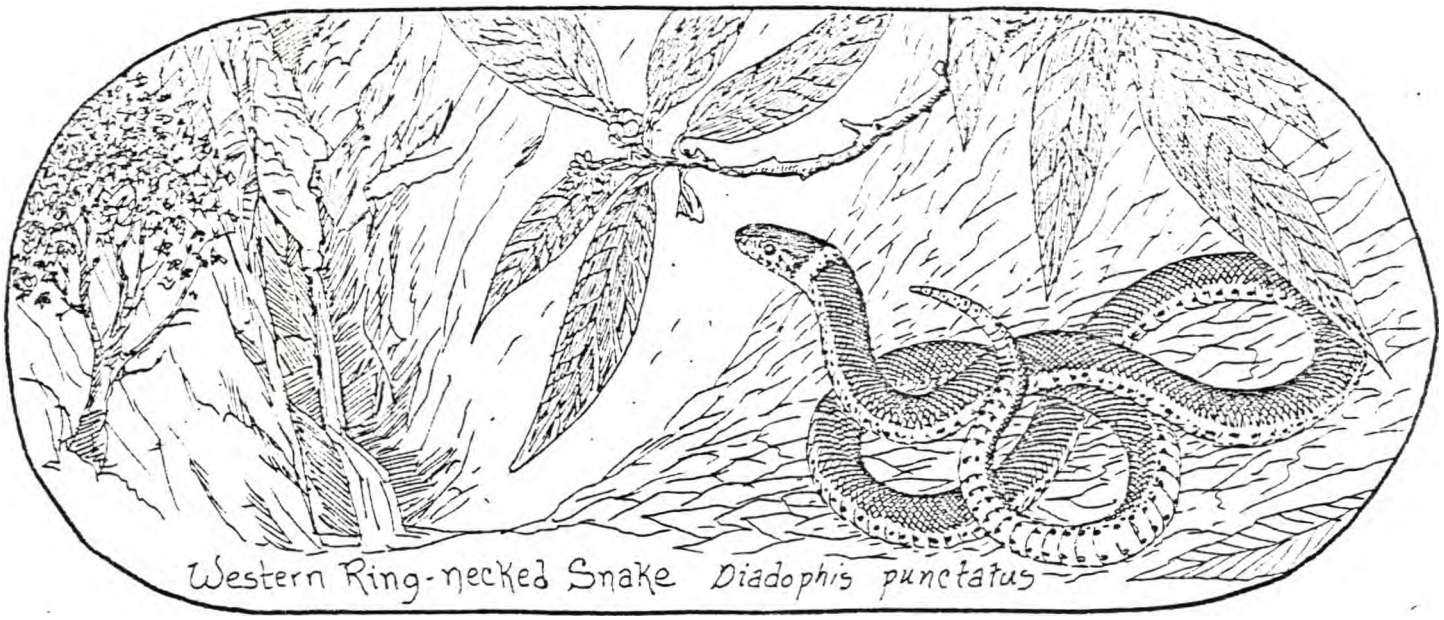
20. Charina bottae (Blainville) - Rubber Boa

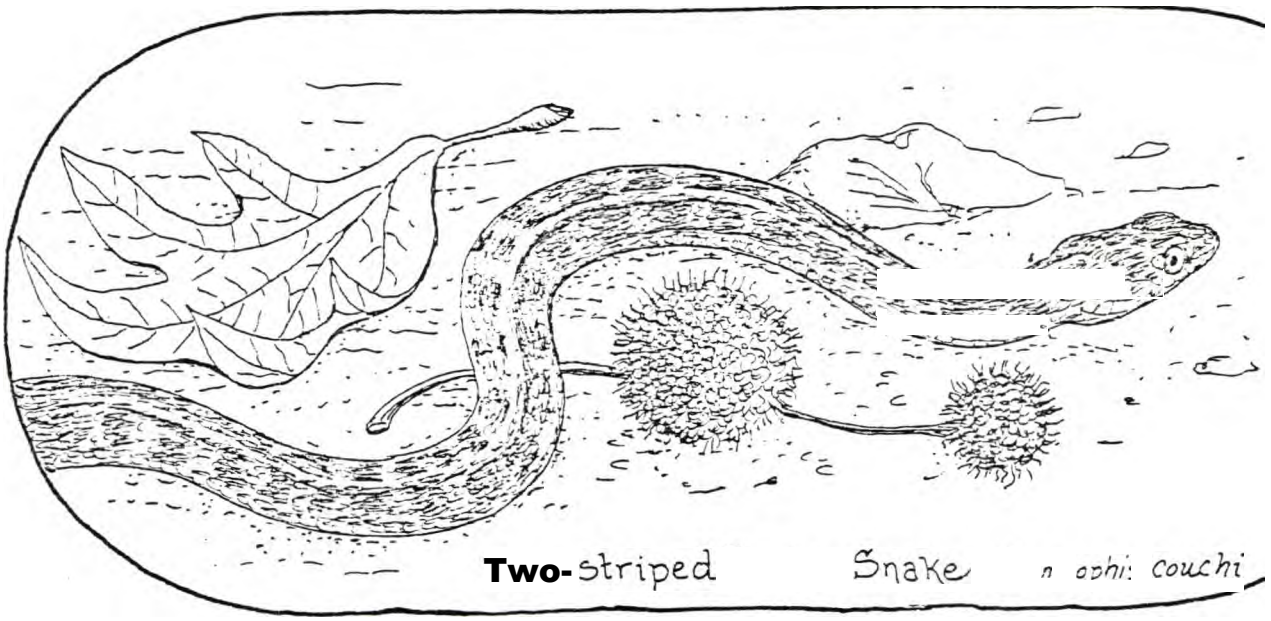
Charina has never been collected in the San Gabriel Mountains. Its presence in the range is possible, based on records from the yellow pine forest of the San Bernardino and San Jacinto Mountains. If the species is present in the San Gabriels, it will probably be collected in the yellow pine community as it was in the other ranges.

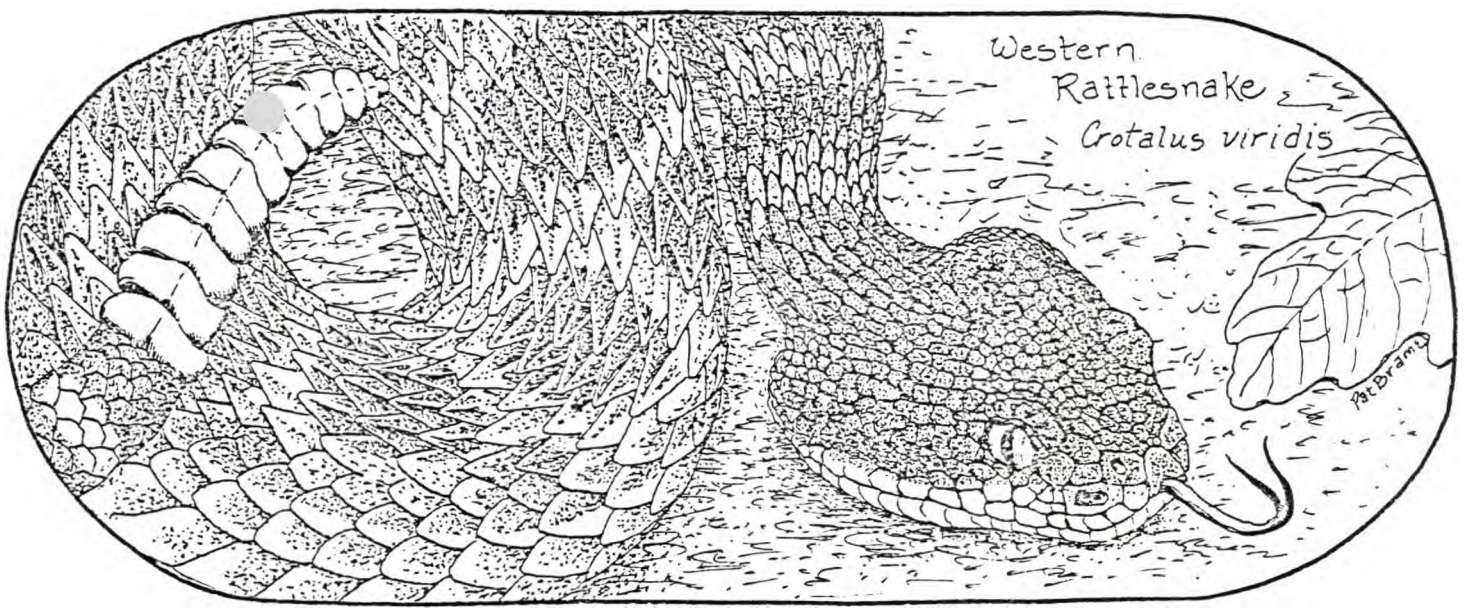
Family - Colubridae

21. Diadophis punctatus (Linne) - Ring-neck Snake

The ring-neck snake is most commonly associated with the oak woodland. A number of specimens also have been collected in the riparian community. Another desirable habitat for these snakes seems to be the lower elevations in the vicinity of habitation. These snakes are most frequently collected in moist situations under rocks, logs or boards. The species is absent from the desert slope. The period of greatest activity appears to be from February to May (Bogert, 1930)


Western Ring-necked Snake Diadophis punctatus


Two-striped Snake n ophis couchi


Western
Rattlesnake
Crotalus viridis

These snakes are usually small. Bogert (1930) reports the largest specimen taken from the San Gabriels at 32.5 mm (21 inches) in total length.

Locality records (Figure 19)

Los Angeles County
- **Placerita** Canyon (Blanchard, 1942)
- Upper Pacoima Canyon (AS)
- Arroyo Seco (Bogert, 1930)
- Arroyo Seco, 6800 feet (Wright and Wright, 1957)
- Millard Canyon (UCLA)
- Eaton Canyon (PHS)
- Pasadena (MVZ)
- Miller's Canyon (Blanchard, 1942)
- Bailey Canyon Trail, Sierra Madre (MVZ)
- Sierra Madre (Blanchard, 1942)
- Santa Anita Canyon, 2.0 miles above the mouth (UCLA)
- Monrovia (Blanchard, 1942)
- Red Box Gap at Angeles Crest Highway (UCLA)
- Azusa (Blanchard, 1942)
- San Gabriel Canyon, 1250 feet (AHF)
- Bear Creek (LACM)
- Glendora (JLV) (MVZ)
- Big Dalton Canyon, 4.0 miles NE Glendora (LMK)
- Volfe Canyon near Tanbark Flats (JVL)
- Glendora Mountain Road, 0.9 mile E East Fork San Gabriel Canyon (KSN)
- San Dimas Canyon (Blanchard, 1942)
- 2.0 miles N Claremont (LMK)
- Claremont (Blanchard, 1942)

22. ***Coluber*** *constrictor* Linne - Racer

This racer is rare in the San Gabriels. It has been collected at only four localities within the range. The scarcity of the species is probably due to the lack of favorable habitat. The snake is most frequently collected in moist open areas in other parts of southern California. For example, specimens have been collected in the blue oak savannah south of Fort Tejon, Kern County and the species is reported to be common in the coastal grasslands south of Culver City, Los Angeles County. Very few grassland habitats are found in the San Gabriels, which probably explains the rarity of both *Coluber constrictor* and ***Eumeces gilberti.*** The blue racer is restricted to the Pacific slope and probably will be collected only in oak woodland or open chaparral adjacent to a stream. Joseph V. Linder reports the collection of one of these snakes in oak woodland at the mouth of Bell Canyon.

Locality records (Figure 20)

Los Angeles County
- Soledad Canyon (FH)
- Mouth of Bell Canyon (JVL)
- Below the dam in Big Dalton Canyon **(LMK)**
- Vicinity of Claremont (Cowles, 1926)

23. Masticophis flagellum (Shaw) - Red Racer

The red racer was at one time common on both slopes of the range. It is still more or less common in the Joshua tree and juniper belts of the desert slope, but it is rather rare or absent in the coastal sage of the Pacific slope. The disappearance of the red racer on the Pacific slope is probably related to the disappearance of its preferr habitat in the coastal sage . This species should still inhabit areas along the base of the range to the southeast in the only remaining large stands of coastal sage. Elsewhere along the base of the Pacifi slope cultivation and habitation have all but wiped out the once extensive stands of coastal sage and with the coastal sage the red race of the Pacific slope.

Locality records (Figure 20)

Los Angeles County
- Harold (LMK)
- Vincent (LMK)
- Palmdale area, Avenue T, 1.5 miles W of 47th St. (AAS)
- Little Rock Creek (LMK)
- Near Pearblossom (LMK)
- Llano (UCLA)
- Wash of Big Rock Creek near Valyermo (RGM)
- Mint Canyon (JWK)
- Vasquez Rocks (UCLA)
- Soledad Canyon, 12.0 and 18.0 miles E Saugus (SDMNH)
- Soledad Canyon, 2.5 miles S Acton (UCLA)
- Arroyo Seco near Pasadena (Grinnell and Grinnell, 1907)
- Near Pasadena (Bogert, 1930)
- San Gabriel Valley (Bogert, 1930)
- Vicinity of Claremont (Cowles, 1926)

San Bernardino County
- Devore **(LMK)**

24. Masticophis lateralis (Hallowell) - Striped Racer

The striped racer is the most abundant snake in the San Gabriels. It is ubiquitous with respect to plant communities. The snake is found least frequently in the Joshua tree community and most **frequentl** in the chaparral. The species has been taken on several occasions as high as 2200 m in the yellow pine community of the Blue Ridge. The largest specimen captured in the San Gabriels was taken on July 28, 1959, at 1100 m on the San Sevaine fire road that ascends from Lytle Creek. The specimen measured 113 cm in total length.

This snake is very difficult to capture alive due to its great speed and the cover in the habitats where it is most common. On August 12, 1959, in the upper Big Tujunga Canyon, Bernard B. Butterworth and I failed to capture a striped racer that sought escaoe in an isolated bush at least eight feet away from any other cover. The snake was seen in the bush and could easily have been captured by shooting, but we wanted the specimen alive. The bush was eventually completely uprooted and destroyed, but the snake had disappeared. In the final analysis, shooting is the easiest and most successful collection technique for the striped racer. On September 1, 1959, a subadult striped racer was found drowned in a ditch that carries water from Mescal Creek to Mescal Reservoir. This inability of

snakes and lizards to escape from steep-sided containers has led several individuals to use five gallon oil cans, sunk into the substrate, as a collection technique. This method has never been used in the San Gabriels to my knowledge, but lines of such containers in association with drift fences should prove to be a successful collection technique in the future.

Locality records (Figure 20)

Los Angeles County
- 1 and 3 miles S Little Rock Reservoir **(AP)**
- Trail to Devil's Punchbowl from South Fork Big Rock Creek (JLV)
- Big Rock Creek at Sycamore Flat campground and at Isla Hermosa campground (UCLA)
- Big Pines Recreation Area, **Camp** Terrisita Pines and Camp Junipero Serra (AAS)
- Jackson Lake (AHF)
- Mescal Creek, 4700 feet (AAS)
- Blue Ridge (Bogert, 1930)
- 1.0 mile N Soledad Canyon public campground (UCLA)
- **Placerita** Canyon **(FH)**
- Upper Pacoima Canyon, 2200 feet (AAS)
- 1.0 mile S Little Tujunga guard station (UCLA)
- 2.0 miles N Little Tujunga guard station (AAS)
- Big Tujunga Canyon (UCLA)
- Mt. Lukens Trail from Big Tujunga Canyon, 2500 feet (AAS)
- Arroyo Seco, about 2 miles N of reservoir (MCL,MBR)
- Eaton Canyon (MCL)
- Angeles Forest Highway along Mill Creek, 3600 feet (AAS)
- Sierra Madre (MVZ)
- Sierra Madre, 2000 feet (**Grinnell** and Camp, 1917)
- Angeles Crest Highway, 0.5 mile E Mt. Wilson turnoff (AAS)
- Back of **Opid's** Camp, Mt. Wilson (LACM)
- Singing Pines Girl Scout Camp near Horse Flats (AAS)
- San Gabriel Wash, Azusa (MVZ)
- San Gabriel Canyon, 3.0 miles N Azusa (KSN)
- Crystal Lake Road 1.0 mile S turnoff to East Fork San Gabriel River (AAS)
- Crystal Lake Road ± 5.0 miles N San Gabriel Dam (ALP)
- East Fork San Gabriel River, 2000 feet (AAS)
- Glendora Mountain Road at East Fork San Gabriel River (ALP)
- Tanbark Flats (JVL)
- Lower San Antonio Canyon (SBCM)
- San Antonio Canyon, 3700 feet (AAS)

San Bernardino County
- Downtown Wrightwood (AAS)
- Sheep Creek, 4500 and 4700 feet (AAS)
- San Sevaine Fire Road from Lytle Creek, 3600 feet (AAS)
- North Fork Lytle Creek, 5220 feet (AAS)

25. *Salvadora* ***hexalepis*** (Cope) - Patch-nosed Snake

The chaparral and coastal sage communities of the Pacific slope are inhabited by the subspecies *Salvadora hexalepis* ***virgultea***. *Salvadora* ***hexalepis*** *mojavensis* has been taken at one locality in the juniper community of the desert slope. The patch-nosed snake is widespread but not common on the Pacific slope. On February 15,

1959, one was taken from under a rock in the East Fork of the San Gabriel River, 600 m elevation. It measured 57.5 cm in snout-vent length and 74.5 cm in total length. On July 28, 1959, a patch-nosed snake was sighted in the coastal sage scrub of Etiwanda Canyon. This record is **unique** because this is the only area in the mountain range that coastal sage occurs at such a high elevation. The specimen was sighted at 830 m, a higher elevation than most chaparral records. The dates of the above records indicate a seasonal period of activity of at least from February to August. The snakes are most **common** during May and June.

Locality records (Figure 21)

Los Angeles County
- Harold (UCLA)
- Mint Canyon (Bogert, 1930)
- Acton (Bogert, 1930)
- 3.0 miles E Acton (MVZ)
- Little Rock Reservoir (MCL)
- Montrose in debris carried down from Snover or Webber Canyon (Bogert, 1930)
- Dark Canyon (Bogert, 1930)
- Arroyo Seco, 5.0 miles from mouth (Grinnell and Grinnell, 1907)
- Upper Pacoima Canyon **(AS)**
- Chaney Trail Rd., 1.0 mile S Sunset Ridge Ranger Station (MCL)
- Pasadena (MVZ)
- Mt. Wilson (Bogert, 1930)
- Sturtevant Trail, Mt. Wilson (UCLA)
- Mt. Wilson Trail (LACM)
- Barley Flats (Bogert, 1930)
- Sierra Madre (MVZ)
- Big Santa Anita Canyon road, 2.8 miles N Foothill Blvd. (AAS)
- East Fork San Gabriel River, 2000 feet (PRE)
- Prairie Fork San Gabriel River (Bogert, 1930)
- Glendora Mountain Road just above Little Dalton Campground (ALP)
- Tanbark Flats (JVL)
- Claremont (Bogert, 1930)

San Bernardino County
- Etiwanda Canyon, 2700 feet (AAS)
- Lytle Creek (Bogert, 1930)

26. *Arizona **elegans*** **Kennicott** - Glossy Snake

Few records are available for this snake in the San Gabriels. The known records, however, are representative of two subspecies. *Arizona **elegans** candida is* a desert form which intergrades with *occidentalis* in the Joshua tree and juniper belts on the desert slope. The coastal form is considerably darker in coloration than the desert form. Most of what is known about these snakes has been recorded by Klauber (1946). The period of seasonal activity is probably somewhat later than that of most snakes. Peak activity seems to occur in June. These snakes are nocturnal and spend the daylight hours under rocks and logs or in self-constructed burrows.

Locality records (Figure 21)

Los Angeles County
Junction of Mint Canyon and Soledad Canyon Roads (Bogert, 1930)
Vincent Station (UCLA)
Little Rock (Bogert, 1930)
Llano (Klauber, 1946)
Valyermo (UCLA)
7.9 miles E **Llano** (UCLA)
10.0 miles E **Llano** (Klauber, 1946)
Verdugo Hills (UCLA)
4.0 miles NW Sunland (Klauber, 1946)
Eaton Canyon, Arroyo Trail (ECNC)
9.0 miles E Azusa (Klauber, 1946)

27. *Pituophis* ***melanoleucus*** (Daudin) - Gopher Snake

Pituophis, like a number of other snakes is represented by two subspecies in the San Gabriel range. Klauber (1947) states that *Pituophis melanoleucus annectens* intergrades with *Pituophis* ***melanoleucus*** *deserticola* along the northerly edge of the San Gabriel Mountains and that no pure *deserticola* occur in the San Gabriel range. On July 22, 1959, a *deserticola* X *annectens* intergrade was collected in the riparian community at 1300 **m** elevation in Big Rock Canyon. This record marks the farthest into the San Gabriel range that *deserticola* influence has been noted. This specimen was also the largest specimen collected in the summer of 1959. It measured **111** cm in total length and 90 cm in snout-vent length. Typical *annectens* inhabits most of the mountain range and is found to be most abundant in the chaparral and yellow pine plant communities.

Wright and Wright (1957) cite the maximum elevation reached by this snake as 6300 feet (1920 **m).** *Pituophis* is quite common at this elevation in the Big Pines Recreation Area and specimens have been collected as high as 2080 **m** near the Big Pines Forest Station. The species probably ranges on up to 2250 in on the Blue Ridge.

Seasonal activity appears to range from February to October. Pequegnat (1951) reports the gopher snake to be active all year long in the Santa Ana range. This condition may also be true of the lower chaparral region in the San Gabriels. Pequegnat also reports the absence of the snake from the riparian community of the Santa Ana range. The snake appears to be fairly common in the stream bank plant community in the San Gabriels. These common snakes are frequently encountered on the road in the late afternoon. Due to their large size and slow movement many of these beneficial snakes are run over by automobiles.

Locality *records* (Figure 21)

Los Angeles County
Harold (Bogert, 1930)
2.0 miles N Little Rock Dam (AAS)
1.0 mile E Llano (UCLA)
Llano (Klauber, 1947)
0.3 mile above Valyermo on road to Jackson Lake (UCLA)
Valyermo (Bogert, 1930)
Devil's Punchbowl (Klauber, 1947)

Big Rock Canyon at Sycamore Flats, 4200 feet (AAS)
South Fork Big Rock Creek at South Fork Campground (JLV)
204th St. 2.0 miles N Mile High (RGM)
Big Pines Recreation Area, Camp Hawthorne, 6300 feet (AAS)
Big Pines Recreation Area, Jackson Lake campground (AAS)
Big Pines Recreation Area, Camp Junipero Serra (RGM)
Big Pines Recreation Area, 0.5 mile E guard station, 6800 feet (AAS)
Mint Canyon, 11.0 miles W Soledad cutoff (AAS)
Soledad Canyon, 0.8 mile E Solemint, 1.8 miles NE Solemint, 3.0 miles NE Solemint, 14.0 miles NE Solemint, 1.5 miles SW Acton, and 4.7 miles E Acton (UCLA)
State Highway 6 at Placerita Canyon cutoff (AAS)
Placerita Canyon (Klauber, 1947)
Upper Pacoima Canyon, 2200 feet (AS)
Little Tujunga Canyon (UCLA)
Big Tujunga Canyon (UCLA)
Trail Canyon, 5.0 miles N Big Tujunga Canyon (AHF)
Angeles Crest Highway, 1.3 miles W Palmdale cutoff (UCLA)
Pasadena (MVZ)
Old Mt. Wilson Trail (MVZ)
Sierra Madre and 1.5 miles N (MVZ)
Singing Pines Girl Scout Camp near Horse Flats (AAS)
Monrovia (Wright and Wright, 1957)
Monrovia Canyon (Klauber, 1947)
Mouth of San Gabriel Canyon, Azusa (MVZ)
West Fork San Gabriel River, 1.8 miles above Crystal Lake Road (UCL
Bear Creek, 1.5 miles N West Fork San Gabriel River (AAS)
Pine Flat, 6000 feet (Bogert, 1930)
1.0 mile below Big Dalton Dam (LMK)
Big Dalton Canyon above forest camp (ALP)
West Fork San Dimas Canyon (KSN)
Tanbark Flats (JVL)
Live Oak Dam (Klauber, 1947)
Claremont (Klauber, 1947)

San Bernardino County
Wrightwood (AAS)
3.0 miles E Wrightwood (AAS)
Sheep Creek (Klauber, 1947)
Lytle Creek, 5000 feet (UCLA)
Devore (Klauber, 1947)
Cajon P. O., also 1.0 and 3.0 miles NW (Klauber, 1947)

28. *Lampropeltis getulus* (Linne) - Common Kingsnake

This snake is occasionally found in the coastal sage, lower chaparral, oak woodland and riparian communities up to 600 in elevatio on the Pacific slope. It is common south of the San Gabriels. The species has been found at only three localities on the desert slope, in the riparian community and the juniper woodland. This snake becomes active in February or March and remains active throughout the summer. Benjamin H. Banta reports that this snake may be frequently collected from the large concrete drainage ditch at the mouth of San Antonio Canyon. The single San Gabriel specimen of the striped phase was recorded near Claremont.

Locality records (Figure 22)

Los Angeles County
  Juniper Hills (BB)
  Mouth of Big Rock Creek (UCLA)
  3.3 miles NE Devil's Punchbowl County Park headquarters (MCL)
  Soledad Canyon public campground (UCLA)
  14.0 miles NE Solemint in Soledad Canyon (UCLA)
  Placerita Canyon (FH)
  Yerba Buena Canyon (Gold Creek) (AHF)
  Tujunga Wash (Grinnell and Grinnell, 1907)
  Eaton Canyon (RC)
  Pasadena (Blanchard, 1921)
  Near Pasadena **(Grinnell** and Grinnell, 1907)
  Azusa (Blanchard, 1921)
  San Gabriel Wash (Grinnell and **Grinnell,** 1907)
  Big Dalton Road just below forest camp (ALP)
  Claremont (Bogert, 1930) - striped phase
San Bernardino County
  Drainage ditch at mouth of San Antonio Canyon (BHB)
  1.0 mile S Cajon Pass (MVZ)

29. *Lampropeltis sonata* (Blainville) - Mountain Kingsnake

Lampropeltis *sonata* replaces *Lampropeltis getulus* above 460 m elevation. Blanchard (1921), concerned with the lack of *getulus* records above 1000 feet, states: " . . . (The) absence of ***boyli*** *(getulus)* from the mountains must be considered as the expression of a habitat preference or perhaps restriction." *L.* ***zonata*** used to be considered primarily an inhabitant of high elevations, principally the yellow pine forest. It is now known to occur as far down the slopes as 460 m. The center of distribution still appears to be in the yellow pine community, but the snakes have followed the streams down to lower altitudes on the Pacific slope and have subsequently spread to adjacent chaparral areas. The snake is now fairly common in the canyons on the Pacific slope. On July 10, 1959, two specimens of ***zonata*** were collected within thirty meters of each other at 610 m in the East Fork of the San Gabriel River. These two specimens were kept in captivity and fed well upon ***Sceloporus*** *occidentalis,* probably one of the major food items in the field as well. One of these specimens upon falling into a pond swam well with lateral undulations of the body.

This species seems most abundant from 1900 to 2100 in elevation in the Big Pines Recreation Area where specimens are frequently reported by campers from April to September. The period of activity at this high elevation seems to begin and end later than at lower elevations. The activity of these snakes tapers off considerably by August in the riparian and chaparral plant communities, but activity does not similarly decline in the yellow pine forest until September. The earlier cessation of activity at lower elevations is probably due to the high temperatures and lack of moisture. The cooler and damper yellow pine forest is more suited to this species later in the year.

The largest specimen reported is 450 mm in total length. This snake was collected just above the **public** camp in Big Dalton Canyon. *L.* ***zonata*** appears to be primarily a diurnal snake. Most specimens are collected in the early morning before 9:00 A.M. Stebbins (1954)

reports one specimen collected on the road at 10:00 P.M. a few miles west of Jackson Lake above Boulder Canyon.

Most specimens from the San Gabriel Mountains are assignable to *L. z. pulchra*, but the San Bernardino County Museum has a specimen of *L. z. parvirubra* from Lone Pine Canyon. Perhaps the other specimens from San Bernardino County are also of this subspecies.

Locality records (Figure 22)

Los Angeles County
- Big Pines Recreation Area, Camp Metawka, Camp Hemohme, Verdugo Pines Boy Scout Camp, Camp Deer Ridge, and Camp Terrisita Pines (AAS)
- Big Pines Recreation Area, 0.5 mile E Guard Station, 6800 feet (AAS)
- Few miles W Jackson Lake above Boulder Creek (Stebbins, 1954)
- Big Pines Recreation Area, Camp Junipero Serra (RGM)
- Jackson Lake (AHF)
- **Placerita** Canyon (Blanchard, 1921)
- Upper **Placerita** Canyon at Bear Divide (FH)
- Sand Canyon (FH)
- 2.0 miles S Newhall (Zweifel, 1952)
- Little Tujunga Canyon, 10.0 miles from San Fernando (Blanchard, 192
- Tujunga Canyon (UCLA)
- Mouth of Goss Canyon, La Crescenta (AAS)
- La Canada (Zweifel, 1952)
- Arroyo Seco Canyon near Pasadena (Blanchard, 1921)
- Altadena (Zweifel, 1952)
- Mt. Lowe (LACM)
- Eaton Canyon (Zweifel, 1952)
- Mt. Wilson (Zweifel, 1952)
- Mt. Wilson Trail (LACM)
- Bailey Canyon, 8000 feet (Blanchard, 1921)
- Trail in Big Santa Anita Canyon (Blanchard, 1921)
- Monrovia Canyon (Zweifel, 1952)
- Monrovia Peak (UCLA)
- Chilao (AHF)
- Singing Pines Girl Scout Camp near Horse Flats (AAS)
- West Fork San Gabriel River, 1.0 mile E Red Box Ranger Station (AAS)
- West Fork San Gabriel River near Camp Kole (JWK)
- Fish Canyon (Blanchard, 1921)
- 0.25 mile NW Falling Springs Resort, 2.0 miles SW Crystal Lake Park (Zweifel, 1952) - type locality for *Lampropeltis zonata parvirubra*
- East Fork San Gabriel River, 2000 feet (AAS)
- East Fork San Gabriel River, 0.5 mile N Camp Bonita (RGM)
- Glendora (Zweifel, 1952)
- Just N of Glendora (JVL)
- Little Dalton Canyon, 1.0 mile above public campground (ALP)
- Bell Canyon (Zweifel, 1952)
- Just below San Dimas reservoir (ALP)

San Bernardino County
- Swartout (Zweifel, 1952)
- Lytle Creek, 6000 feet (Blanchard, 1921)
- Lone Pine Canyon, near Clyde Ranch, 4900 feet (SBCM)

30. Rhinocheilus lecontei Baird and Girard - Long-nosed Snake

Records for the long-nosed snake in the San Gabriel Mountains are not numerous. The existing records, however, are from both slopes of the range. The snake is probably more abundant than the records would indicate. On the Pacific slope, coastal sage and lower chaparral are the preferred plant communities. The juniper community is preferred on the desert slope. Klauber (1941) reports that it is seldom collected above 1200 m. The highest elevation at which this snake has been recorded in the San Gabriels is 1260 m at a locality 4.0 km southeast of Little Rock. May appears to be the month of peak activity. The long-nosed snake is crepuscular or nocturnal in habit. In the daytime this species has been collected from under boards, logs, rocks and flat lying objects. Fossorial activity is not uncommon.

Locality records (Figure 22)

Los Angeles County
- Vincent Station (UCLA)
- Harold (Bogert, 1930)
- 2.5 miles NE Vincent (Klauber, 1941)
- 4.0 miles N Little Rock (UCLA)
- 3.0 miles SE Little Rock (UCLA)
- Llano (UCLA)
- Mint Canyon, 300 yds. W of summit (UCLA)
- 6.0 miles SW Harold in Mint Canyon (Bogert, 1930)
- 9.7 miles W Acton (MVZ)
- La Canada Valley (Ruthling, 1915b)
- Pasadena (MVZ)
- Altadena (Klauber, 1941)
- Claremont (Bogert, 1930)

San Bernardino County
- Etiwanda (Klauber, 1941)
- Cajon Station (Klauber, 1941)

31. Thamnophis couchi (Kennicott) - Western Garter Snake

The systematic status of this common snake is not well understood. The snake of the San Gabriel Mountains presently is referred to *Thamnophis couchi hammondi* (Fitch, 1948).

This garter snake is limited to the riparian plant community and is common on both slopes of the mountain range up to 1200 in elevation. It has been collected at 1900 m at Jackson Lake in the Big Pines Recreation Area. The area of the streams where these snakes are most common is where the water is slow moving and tends to form pools and ponds. During the arid summer of 1959, as many as three and four specimens were collected in a single pool in streams such as Little Rock Creek and the Upper Pacoima Creek where there remained only intermittent ponds. The period of seasonal activity for this species ranges from March to September; peak activity occurs in June.

The largest specimen captured in the San Gabriels was taken at 1300 in in Big Rock Creek. This specimen measured 860 mm in total length and 660 mm in snout-vent length. The size of this specimen was even more accentuated by its very stout body. At first glance

this stout body plus the presence of a large triangular head made this garter snake appear like a rattlesnake. The viper-like appearance of certain specimens of this snake explains the probable source for the long withstanding tale of water moccasins that were once supposed to have inhabited Jackson Lake.

Bogert (1930) cites this snake as the one thoroughly destructive snake of Los Angeles County. The species apparently feeds mostly upo tadpoles, earthworms, toads, frogs and fish. Specimens in captivity have been observed to gorge themselves upon *Hyla regilla, Hyla cadaverina,* and small *Bufo boreas.* The distasteful mucous of the latter species has no apparent effect upon the garter snakes. *Hyla cadaverina* tadpoles were observed to be a food item in the upper Pacoima Creek where a specimen was collected in a shallow pool with many tadpoles. Two species of fish have been observed as natural food items; the creek chub, *Gila sp.,* appears to be an important food item in Big Tujunga Creek. A garter snake was collected in a shallow isolated pond about one mile below Big Tujunga Dam in the process of stalking a school of chubs. On another occasion, at 1300 m in Big Rock Creek, a garter snake was collected in the process of swallowing a six-inch trout *(Salmo* ***gairdneri*****).** The caretaker at Camp Rincon adds mammals to the list of prey for this species of snake. He tells the story of a garter snake that ate a mouse from his hand.

Locality records (Figure 23)

Los Angeles County
- Little Rock Canyon, 4400 feet (AAS)
- Big Rock Canyon, 4200 feet (AAS)
- Jackson Lake, Big Pines Recreation Area (AHF)
- Soledad Canyon, center of length near public camp (UCLA)
- **Placerita** Canyon, 2.0 miles from Highway 6 (UCLA)
- Upper Pacoima Creek, 2800 feet (AAS)
- Big Tujunga Canyon, 1.5 and 2.2 miles N Angeles Forest Boundary (UC
- Big Tujunga Canyon, 1.7 and 3.0 miles N guard station (UCLA)
- Big Tujunga Canyon at bridge 1.0 mile below reservoir (AAS)
- Upper Big Tujunga Creek, 3200 feet (AAS)
- Mill Creek near Big Tujunga (UCLA)
- Arroyo Seco N of reservoir (MCL)
- Switzer's Camp, upper Arroyo Seco (MCL)
- Eaton Canyon, 2500 feet (AHF)
- Winter Creek, 2800 feet (AHF)
- Monrovia Canyon (Fitch, 1940)
- West Fork San Gabriel River, 3000 feet (Fitch, 1940)
- West Fork San Gabriel River, 2000 feet (KSN)
- West Fork San Gabriel River, 1.5 miles E Cogswell Dam (AAS)
- North Fork San Gabriel River (Fitch, 1940)
- West Fork San Gabriel River near Camp Rincon (ALP)
- Crystal Lake (Fitch, 1940)
- East Fork San Gabriel River, 3.9 miles E Highway 39 (UCLA)
- Prairie Fork San Gabriel River at Vincent Gulch, 4300 feet (AAS)
- East Fork San Gabriel River, 1900 feet (AAS)
- Fish Canyon (UCLA)
- Big Dalton Canyon, 2.0 miles above forest camp (ALP)

San Bernardino County
- Lytle Creek (SBCM)

32. Thamnophis sirtalis (Linne) - Pacific Garter Snake

This snake has never been collected in the San Gabriels. Bogert (1930) records this species as moderately common in the sloughs along the coast. Fitch (1941) records specimens from the Tehachapi range north of the San Gabriels and from the San Bernardino range to the east. It may be seen, then, that the known range of this garter snake almost surrounds the San Gabriel Mountains. Palmer (1917) describes Bottars visit to California when the type specimen for *T. s. infernalis* was collected. Concerned with that type locality, Fitch (1941) states that Botta could have obtained that specimen at San Gabriel or Los Angeles. If San Gabriel is the type locality, the known range of the species at least reaches the foothills. However, Los Angeles is more likely, due to the abundance of records from the coastal area. Eventually, this snake will probably be collected in the chaparral or riparian community of the San Gabriel Mountains proper.

Locality records (Figure 23)

Los Angeles County
  Possible record at San Gabriel (Fitch, 1941) - Type locality for *Thamnophis sirtalis infernalis*

33. Tantilla planiceps (Blainville) - Black-headed Snake

Tantilla is rare in the San Gabriel Mountains. The species has been collected only on the Pacific slope, but the collection of specimens from the desert slope is not improbable. Ruthling (1915a) reported a *Tantilla* from near Los Angeles. Bogert (1930), in pinpointing the locality more specifically, placed it in the Verdugo Hills between La Crescenta and Brandt Canyon. The only verified records are from chaparral. One unconfirmed record adds the riparian plant community as another possible habitat. The unconfirmed specimen was collected by two boys, Alan Sutherland and Ray Rempt, who said they collected the snake in the upper Pacoima Canyon near Honey Bee Camp. I never saw the specimen, but the boys know snakes very well and probably had identified it correctly. The only other species it might have been was *Diadophis punctatus* which is known to occur in the riparian community.

Locality records (Figure 24)

Los Angeles County
  Upper Pacoima Canyon near Honey Bee Camp (AS)
  Between Brandt Canyon and La Crescenta (Bogert, 1930) - Clarification of Ruthling, 1915a, half a day's walk from Los Angeles
  0.5 mile S Switzer's Camp, Arroyo Seco (UCLA)
  Eaton Canyon (ECNC)
  10 miles N Glendora on Glendora Ridge Road (SBCM)

34. Trimorphodon vandenburghi Klauber - Lyre Snake

Trimorphodon is another rare snake in the San Gabriels. All localities except one are in the chaparral of the Pacific slope.

The exceptional locality is from Mint Canyon near Acton in the juniper community. No specimens have been recorded from the desert slope although the snake probably occurs there. Klauber (1928, 1940a) describes the preferred habitat as rocky hillsides below 3000 feet (920 m) where the snakes inhabit deep cracks in the rocks. Daytime collecting of this nocturnal snake is strenuous work due to the necessity of stripping off thick exfoliating sheets of granite in order to expose the animals.

Locality records (Figure 24)

Los Angeles County
4.0 miles NW Acton (Klauber, 1940a)
Eaton Canyon on road to Henniger Flats, 1400 feet (HS)
Sierra Madre (Klauber, 1940a)
Claremont (Klauber, 1928)

35. ***Hypsiglena*** *torquata* (Gunther) - Spotted Night Snake

Hypsiglena has been collected in the chaparral of the Pacific slope and the juniper woodland of the desert slope. The habitat preference for this species is like that of *Trimorphodon* in the San Gabriels except that *Hypsiglena* is found under the thin flakes of exfoliating granite rather than in deep cracks. *Hypsiglena* is more often taken on the roads of the coastal slope than is *Trimorphodon.* The **limited** number of locality records for this species indicate a period of activity from at least February 15 to July 10. The peak of activity appears to be in May.

On February 15, 1959, Paul Ennis collected a *Hypsiglena* from under rock flakes at 580 m elevation in the East Fork of the San Gabriel River. This specimen was kept in captivity and fed well upon *Batrachoseps attenuatus* and *Rhyacotriton olympicus. Rhyacotriton* is obviously not a food item in the San Gabriel Mountains, but *Batrachoseps* as well as small lizards such as *Uta* and *Xantusia* are probably important articles in the night snake's diet.

There has been a great deal of discussion, both pro and con, concerning the venomous qualities of the night snake saliva. Wright and Wright (1957) record the observations of Dr. T. H. Lewis who concluded that *Hypsiglena* has venom of low virulence. Cowles (1941) has also experimented with the venomous qualities of *Hypsiglena* saliva. Observations on the feeding of the captive *Hypsiglena* at four instances during February and March, 1959, also seem to substantiate a low toxicity of *Hypsiglena* venom. The activity of the snake during feeding may be summarized as follows: within a few seconds after a salamander was introduced into the cage, the snake became alerted and began searching about the cage. Numerous protrusions of the tongue were observed as the snake moved about. Upon sighting movement of the salamander, the snake stopped its movements entirely except for frequent protrusions of the tongue. This immobile pose was held until the salamander moved again. Immediately the snake struck. On all four occasions the strike landed perpendicular to the body of the salamander, midway between the front and hind limbs. The snake then backed up, holding the writhing salamande in its mouth. The backward locomotion continued until the salamander stopped its writhing and contortions. The snake exhibited frequent chewing motions in what was interpreted as attempts to move the salamander as far back into its mouth as possible where the use of rear

fangs would be most effective. No attempt at constriction or coiling was observed. Approximately five minutes after the initial strike the salamander stopped squirming and the snake ceased its backward locomotion. The snake then lay quietly for about two minutes during which time several chewing motions were observed. These chewing motions appeared to be more in the nature of relaxing as opposed to the earlier similar activity where a more secure hold upon the salamander was attempted with each movement of the jaws. When the salamander was obviously dead, the snake released its hold upon the abdomen of the salamander and secured a new hold upon its head. The salamander was then eaten in ordinary snake fashion, head first.

Locality records (Figure 24)

Los Angeles County
  Harold vicinity (UCLA)
  Vincent (UCLA)
  Pearblossom (UCLA)
  Valyermo Road at L. A. County Fire Station No. 79, 3600 feet (MCL)
  Pallett Creek Road at St. Andrews Priory, 3600 feet (DWF)
  2.0 miles W Llano (UCLA)
  Little Tujunga Canyon near Oak Springs (JWK)
  Montrose, in debris carried down from Webber or Snover Canyons (Bogert, 1930)
  Half a day's walk from Los Angeles (Ruthling, **1915a)**
  Mt. Lowe (LMK)
  Mt. Wilson (Tanner, 1944)
  Mt. Wilson Trail near Sierra Madre (Bogert, 1930)
  Bear Canyon (LMK)
  East Fork San Gabriel River, 1900 feet (PRE)
  Vicinity of Claremont (Cowles, 1926)
San Bernardino County
  0.5 mile N Wrightwood (LACM)

Family - Viperidae

36. *Crotalus cerastes* Hallowell - Sidewinder

The sidewinder barely gets into the mountains along the northeastern foothills in the Joshua tree belt. They are occasionally collected on Highway 138 in the vicinity of Desert Springs. *C. cerastes* is usually collected on the road at night. The period of activity for the species is from March to August. Most specimens are collected in June.

Old timers who have spent many years in the mountains have told me, on several occasions, of snakes they call sidewinders that are not rattlesnakes. It is common for a number of different snakes to "sidewind" when on a smooth surface or loose sand. These men could have been talking about a number of different species which were sidewinding at the time of observation. They even may have been referring to young *CrotaZus viridis* which are sometimes called sidewinders.

Locality records (Figure 25)

San Bernardino County
  8.0 miles E **Llano** (LMK)

State Highway 138 near Desert Springs (FCT)

37. Crotalus scutulatus (Kennicott) - Mojave Rattlesnake

This snake is known locally as the desert green rattlesnake. Like the sidewinder, it is principally a desert species but is occasionally found in the Joshua tree belt along the base of the foothills. *C. scutulatus,* like *cerastes,* is usually collected on the road at night. Bogert (1930) states that these snakes are usually found in open desert in the vicinity of kangaroo rat colonies. These small mammals evidently make up a large part of the Mojave rattlesnake's diet. The period of activity is from March to August. Most specimens have been collected in June.

Locality records (Figure 25)

Los Angeles County
3.0 miles NW Little Rock (LMK)
Little Rock (LMK)
5.0 miles NW Shoemaker (LMK)
Valyermo (UCLA)
Llano (LMK)
1.0 mile E Llano (LMK)
3.5 miles E Llano (UCLA)
6.0 miles E Llano (LMK)
San Bernardino County
5.0 miles SE Pearblossom Road on Highway 138 (FCT)

38. Crotalus viridis (Rafinesque) – Southern Pacific Rattlesnake

Crotalus viridis is the most common rattlesnake of the San Gabriel Mountains. It is a common inhabitant in every plant community. It has been collected least frequently in the Joshua tree community of the desert slope. The species ranges from the base of the foothills to over 2700 m elevation. The period of seasonal activity is from March to September, but occasional specimens are collected both earlier and later. May is the month of greatest activity.

As is the case in any region inhabited by rattlesnakes, conversation about snakes invariably leads to the discussion of large sizes of the rattlesnakes that have been observed. Numerous persons talked about five and six foot specimens from the San Gabriels. The largest specimen that was measured was taken at the dump near Chilao Flats. It measured 1250 mm (4 feet, 2 inches) in total length. Klauber (1956) records the largest specimen of *Crotalus viridis* on record at 1371 mm.

The color of this species is variable. As a general rule, those specimens taken at altitudes above 1800 in are black and those below that altitude are brown. Essentially, specimens from the yellow pine forest are darker than those of other plant communities. However, one very black specimen was collected at 640 m in San Sevaine Canyon in the riparian community. Occasionally, specimens from the yellow pine belt have an irridescent green cast to them. One such specimen was collected at Guf fey Camp near Wrightwood. The forest patrolman from Lytle Creek reported the collection of a specimen from near Deyore that was pink colored. This pink specimen was only described

to me, but it could have been an albino, a condition which is not uncommon (Klauber, 1956). Another feasible explanation is that the specimen was not ***Crotalus*** *viridis* but ***Crotalus mitchelli*** which has been taken in the San Bernardino range just east of Devore. If the latter explanation is correct, then this is the first *mitchelli* taken from the San Gabriel Mountains.

Only one rattlesnake den has been reported in the San Gabriel Mountains. This den was discovered by the forest service when clearing a firebreak on the west slope of Cucamonga Canyon near the mouth. A number of snakes were observed together in a depression under a large pile of rocks.

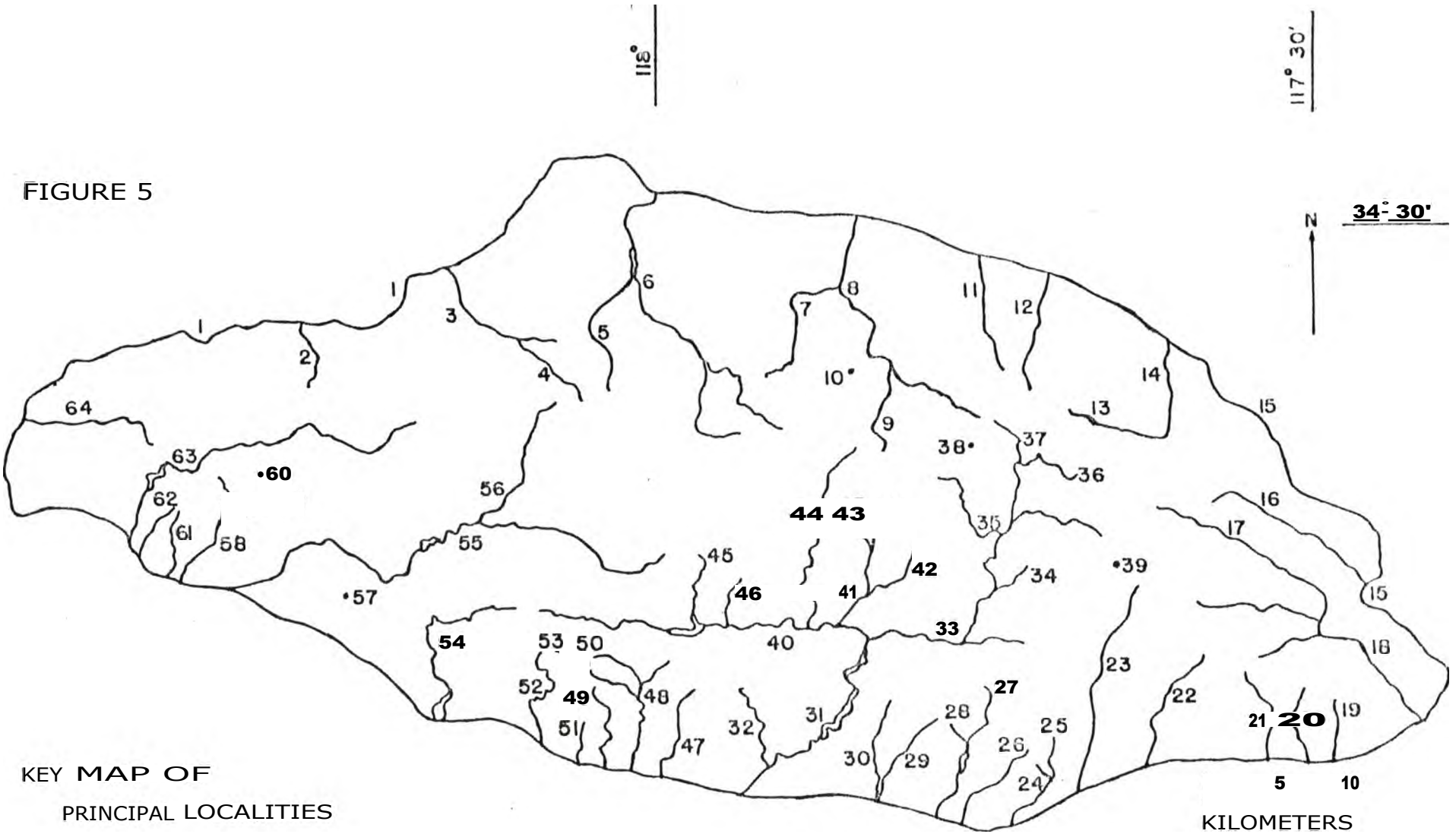
Locality records (Figure 25)

Los Angeles County
- Harold (LMK)
- Angeles Forest Highway at Santiago Canyon turnoff (AAS)
- Angeles Forest Highway, 5.5 and 7.0 miles SE Vincent (SHJ)
- Little Rock Canyon (LMK)
- Devil's Punchbowl (LMK)
- Valyermo (LMK)
- South Fork Big Rock Creek near campground (JLV)
- **Caldwell** Lake, above and E of Valyermo P. 0. (UCLA)
- 204th St. N of Mile High (RGM)
- Boulder Creek (RGM)
- Big Pines Recreation Area, All Nations Camp and Camp Junipero Serra (AAS)
- Mescal Creek, lower, middle and upper (LMK)
- Soledad Canyon, 4.0 miles W **Agua** Dulce Canyon (UCLA)
- **Placerita** Canyon (LMK)
- Pacoima Canyon near Honey Bee Camp (AS)
- Mendenhall Peak (LMK)
- Big Tujunga Canyon (UCLA)
- Big Tujunga Canyon above the dam (LMK)
- Mullaly Canyon, NE of La Crescenta (MCL)
- Angeles Forest Highway at Big Tujunga Canyon cutoff (AAS)
- Arroyo Seco (LMK)
- Angeles Crest Highway, 7.0 miles N La Canada, 2900 feet *(SHJ)*
- Altadena (AAS)
- W side of Mt. Lowe (UCLA)
- Near top of Mt. Wilson (MVZ)
- Idlehour trail, upper Eaton Canyon (MCL,MBR)
- Bailey Canyon near Sierra Madre (MVZ)
- Sierra Madre (MVZ)
- Angeles Christian Camp and Singing Pines Girl Scout Camp near Horse Flats (AAS)
- Angeles Crest Highway just NE Newcomb's Ranch (AAS)
- Angeles Crest Highway, 0.5 mile SW Buckhorn Camp (AAS)
- Mt. Waterman (UCLA)
- Fish Canyon, lower end (DWF)
- West Fork San Gabriel River, 2.0 miles W Bear Creek (ALP)
- San Gabriel Canyon Road, 0.5 mile N Morris Dam (AAS)
- Mt. Islip (LMK)
- Pine Flats **(LMK)**
- Crystal Lake (AHF)
- East Fork San Gabriel River, 2000 feet (AAS)
- Mine Gulch from East Fork San Gabriel River to 1.0 mile W (AAS)
- Vincent Gulch (LMK)

Mt. Baden-Powell (LMK)
Prairie Fork San Gabriel River (LMK)
Little Dalton Canyon just above campgrounds (ALP)
Road west of Tanbark Flat (KSN)
San Dimas Canyon (AHF)
Thompson Creek Wash, 1360 feet (LCW)
Summit of divide between Mt. Dawson and Mt. San Antonio, over 9000 feet (Bogert, 1930)

San Bernardino County
Swartout Valley near Wrightwood (UCLA)
Guffey Camp near Wrightwood (AAS)
Wright Mt. on Blue Ridge (LMK)
East slope of Cucamonga Canyon near the mouth (LCFR)
San Sevaine Canyon, 2100 feet (AAS)
Near Devore (LCFR) - possible *Crotalus mitchelli*
Applewhite Campground in North Fork Lytle Creek (LCFR)
Lone Pine Canyon several miles NE Wrightwood (AAS)

FIGURE 5



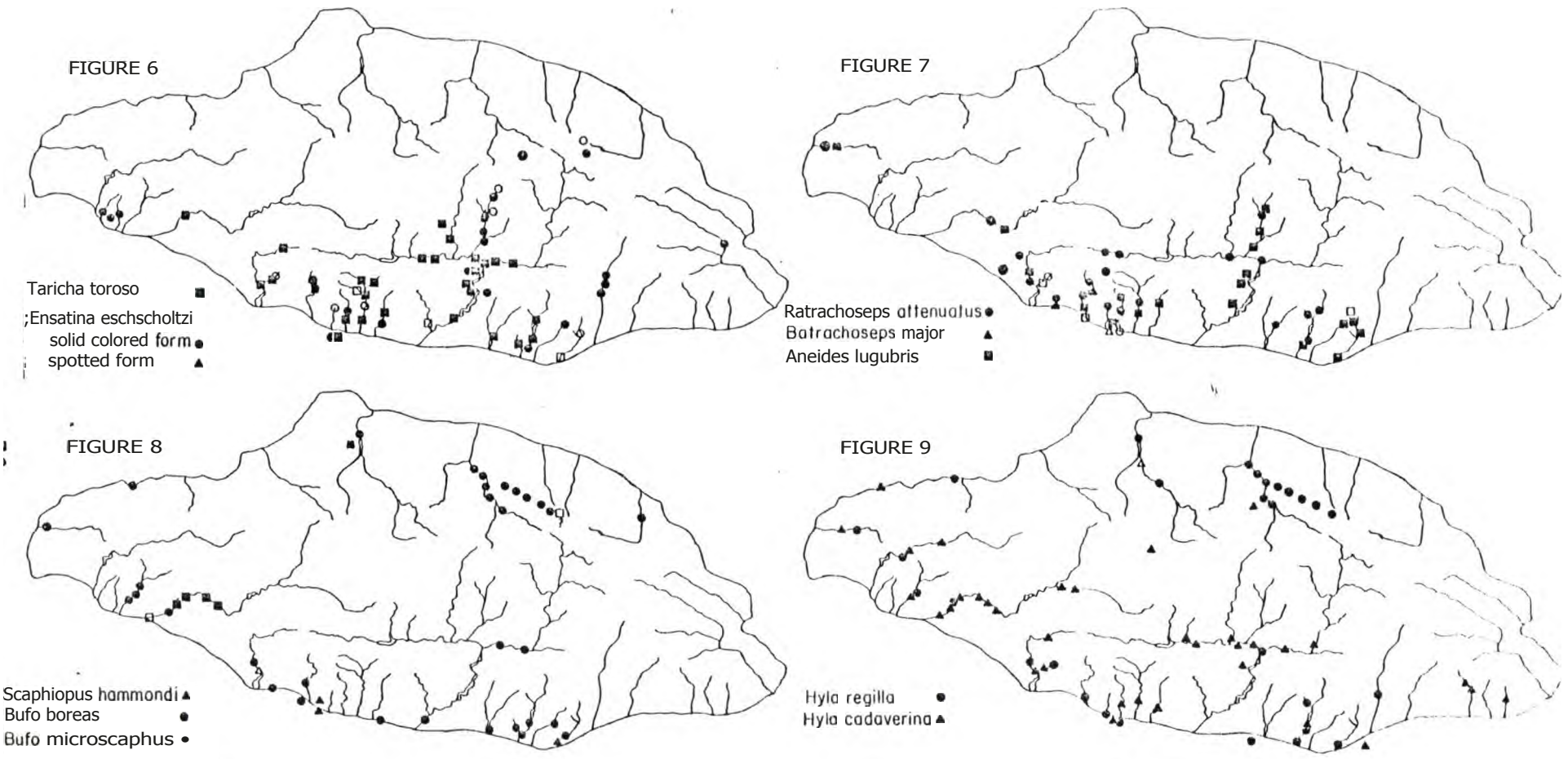
KEY MAP OF

PRINCIPAL LOCALITIES

Figure 5

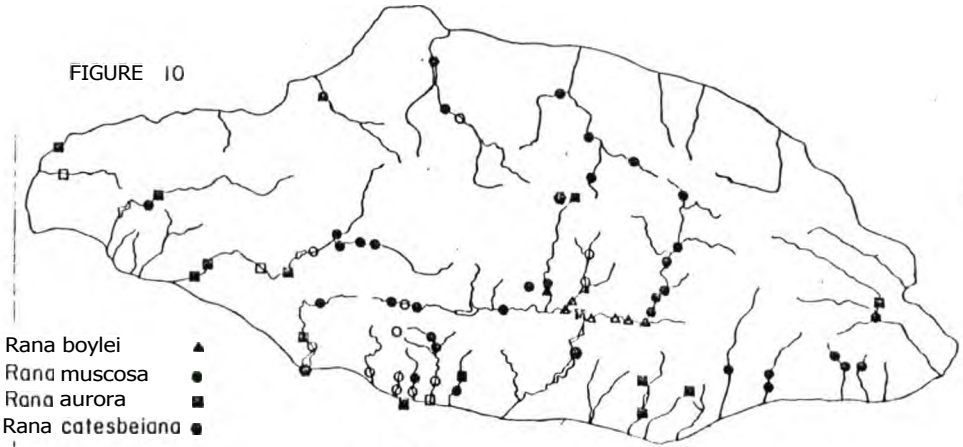
Key *map of principal localities*. **The numbers correspond to the numbers of the principal localities listed below.**

1. Soledad Canyon
2. Indian Canyon
3. Aliso Canyon
4. Tie Canyon
5. Santiago Canyon
6. Little Rock Creek
7. Pallett Creek
8. Big Rock Creek
9. South Fork, Big Rock Creek
10. Devil's Punchbowl
11. Boulder Creek
12. Mescal Creek
13. Swarthout Canyon
14. Sheep Creek
15. Cajon Canyon
16. Lone Pine Canyon
17. North Fork, Lytle Creek
18. Lytle Creek
19. San Sevaine Canyon
20. Etiwanda Canyon
21. Day Canyon
22. Cucamonga Canyon
23. San Antonio Canyon
24. Thompson Creek
25. Palmer Canyon
26. Live Oak Canyon
27. San Dimas Canyon
28. West Fork, San Dimas Canyon
29. Big Dalton Canyon
30. Little Dalton Canyon
31. San Gabriel Canyon
32. Fish Canyon
33. East Fork, San Gabriel River
34. Allison Gulch
35. Iron Fork, San Gabriel River
36. Prairie Fork, San Gabriel River
37. Vincent Gulch
38. Mount Baden-Powell
39. Mount San Antonio (Mt. Baldy)
40. West Fork, San Gabriel River
41. North Fork, San Gabriel River
42. Bichota Canyon
43. Coldbrook
44. Bear Canyon
45. Devil's Canyon
46. Chileno Canyon
47. Monrovia Canyon
48. Santa Anita Canyon
49. Little Santa Anita Canyon
50. Winter Creek
51. Bailey Canyon
52. Eaton Canyon
53. Mount Wilson
54. Arroyo Seco
55. Big Tujunga Canyon
56. Mill Creek
57. Mount Lukens
58. Little Tujunga Canyon
59. Gold Creek
60. Mendenhall Creek
61. Kagel Canyon
62. Lopez Canyon
63. Pacoima Canyon
64. Placerita Canyon



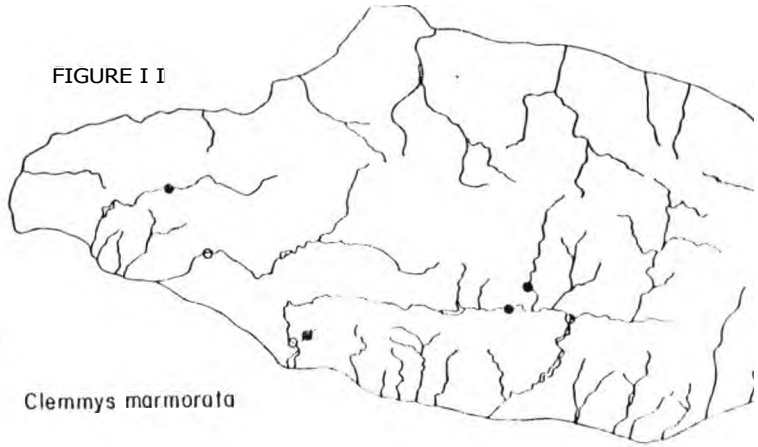
Figures 6 through 25 - Locality maps for herpetofaunal species in the San Gabriel Mountains. Localities for each species indicated by triangles, circles, squares, and hexagonals. Solid figures indicate specimens examined. Open figures indicate literature records. Records correspond to those in the species accounts, which as they appear on the maps, are listed in order from left to right with desert localities first.

FIGURE 10



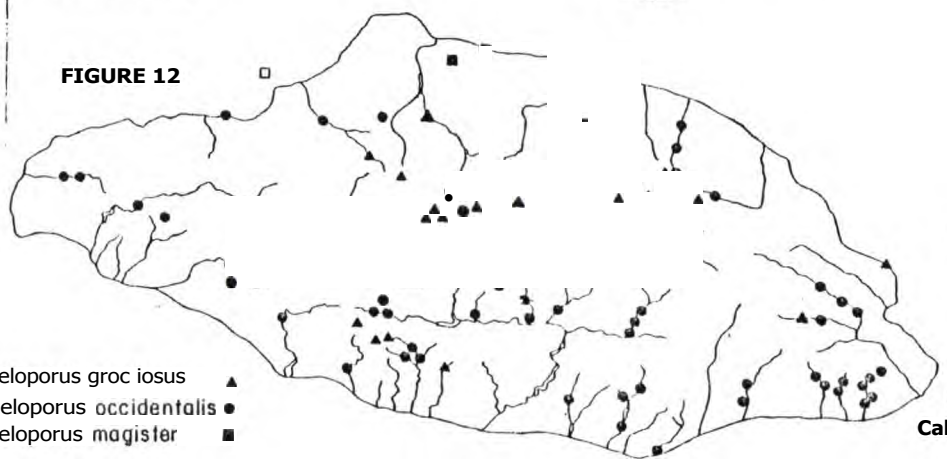
Rana boylei ▲
Rana muscosa ●
Rana aurora ■
Rana catesbeiana ●

FIGURE I I



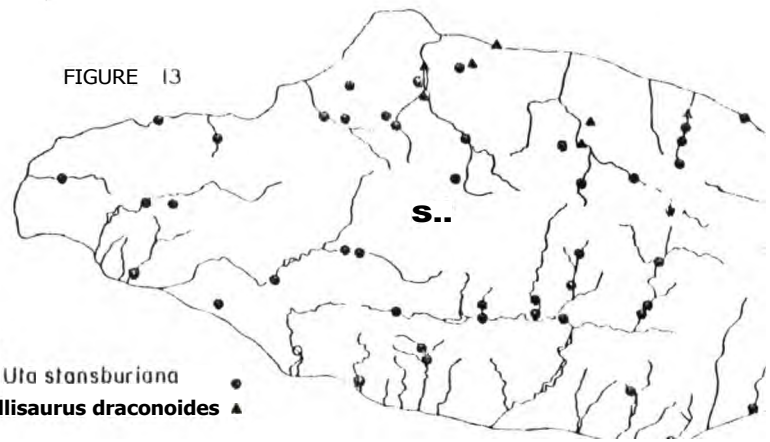
Clemmys marmorata

FIGURE 12



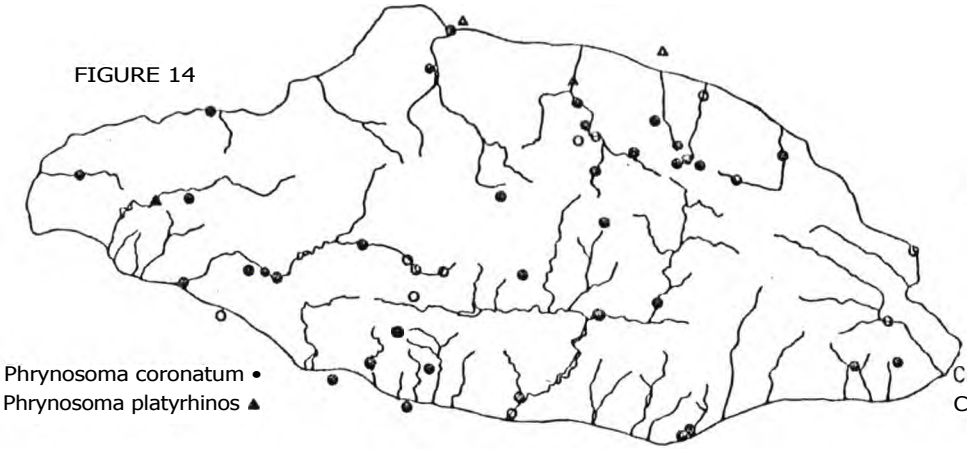
Sceloporus groc iosus ▲
Sceloporus occidentalis ●
Sceloporus magister ■

FIGURE 13



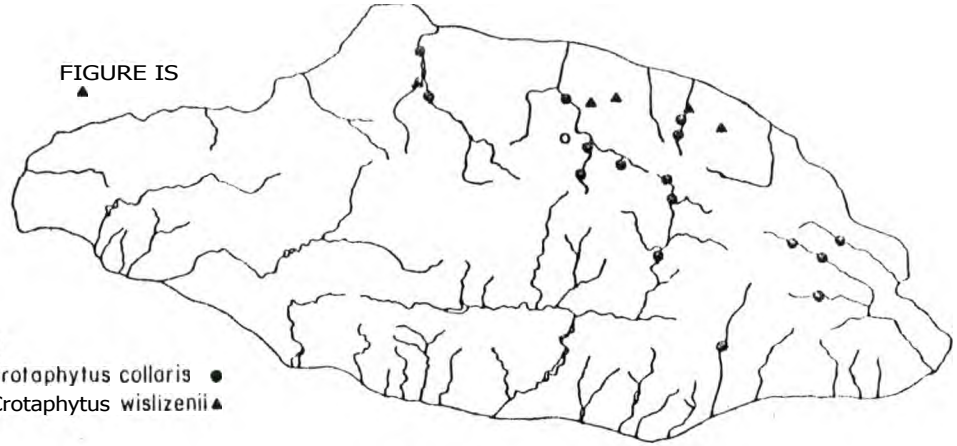
Uta stansburiana ●
Callisaurus draconoides ▲

FIGURE 14



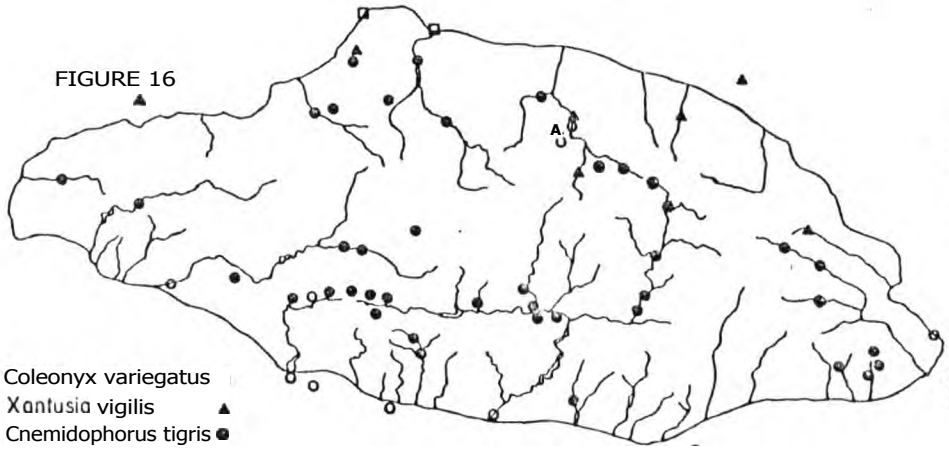
Phrynosoma coronatum •
Phrynosoma platyrhinos ▲

FIGURE IS



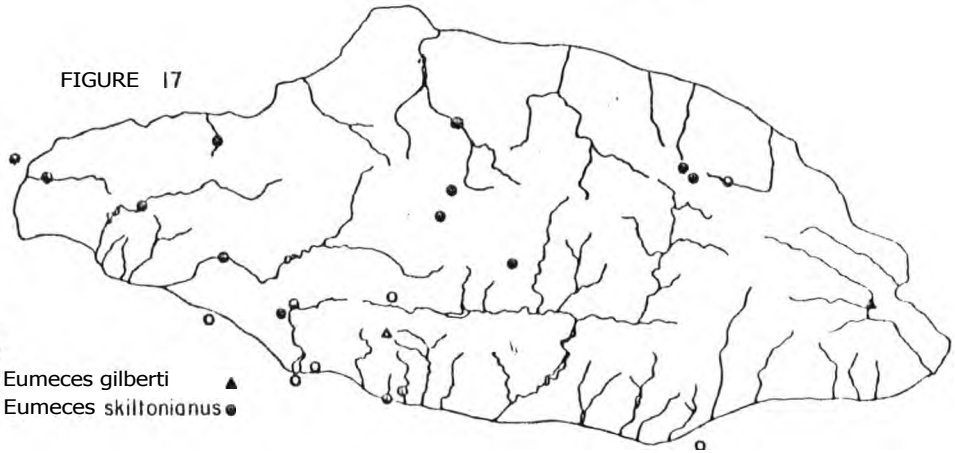
Crotaphytus collaris ●
Crotaphytus wislizenii ▲

FIGURE 16



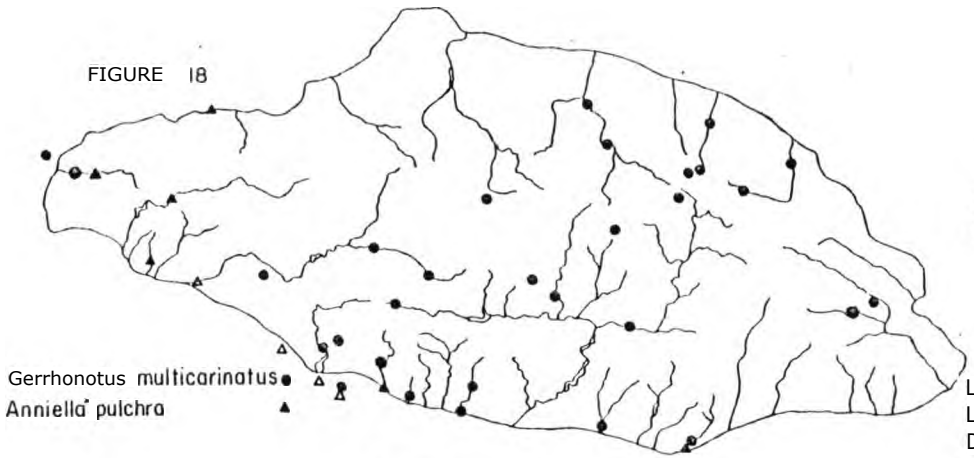
Coleonyx variegatus
Xantusia vigilis ▲
Cnemidophorus tigris ●

FIGURE 17



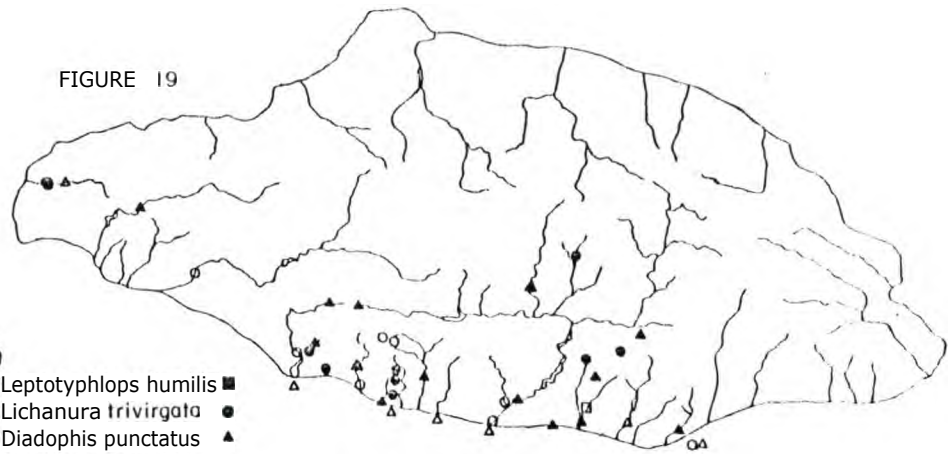
Eumeces gilberti ▲
Eumeces skiltonianus ●

FIGURE 18



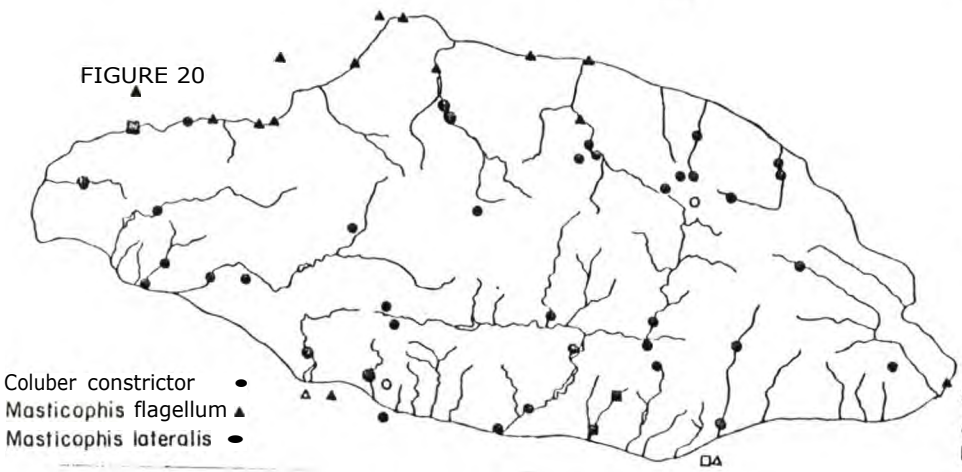
Gerrhonotus multicarinatus ●
Anniella pulchra ▲

FIGURE 19



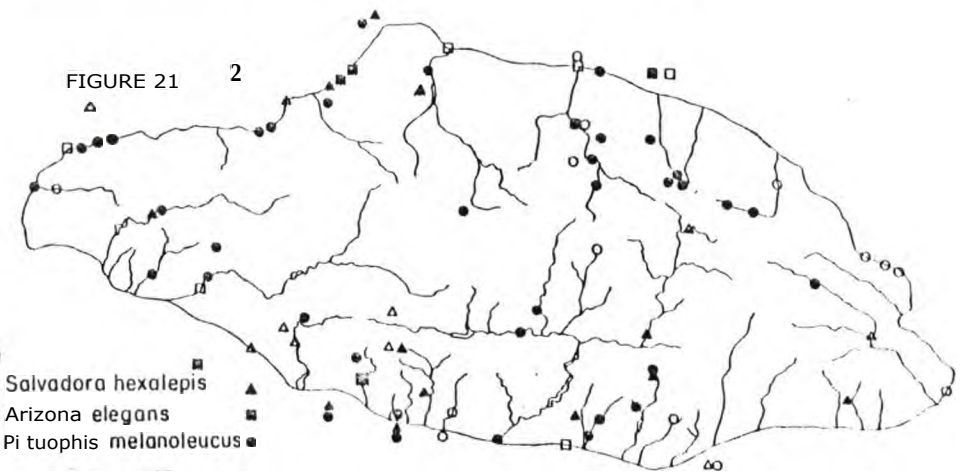
Leptotyphlops humilis ■
Lichanura trivirgata ●
Diadophis punctatus ▲

FIGURE 20



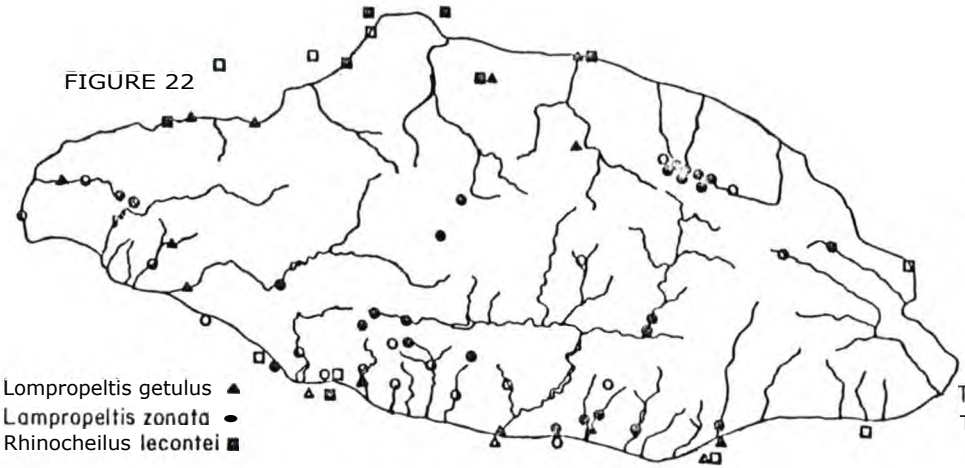
Coluber constrictor ●
Masticophis flagellum ▲
Masticophis lateralis ●

FIGURE 21



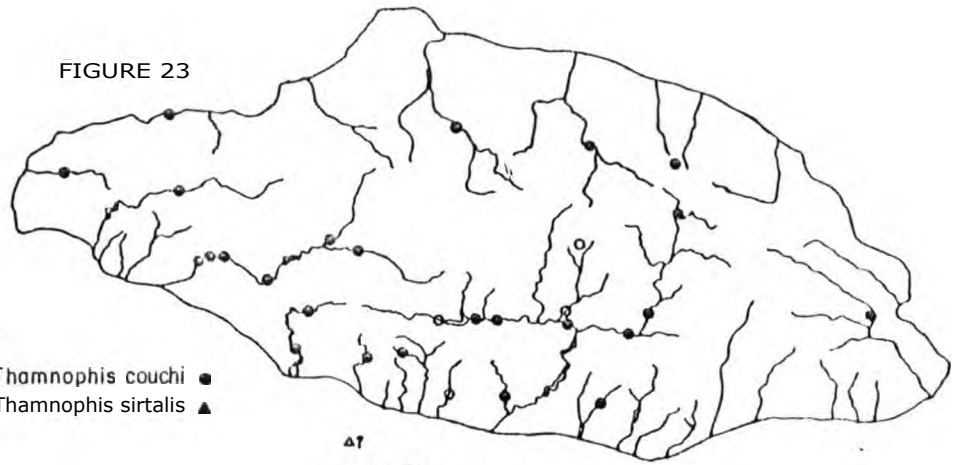
Salvadora hexalepis ▲
Arizona elegans ■
Pi tuophis melanoleucus ●

FIGURE 22



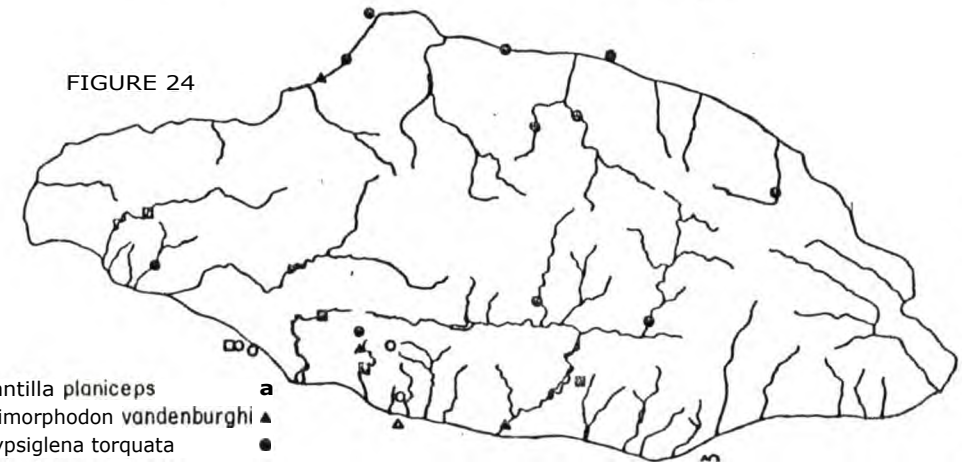
Lompropeltis getulus ▲
Lampropeltis zonata ●
Rhinocheilus lecontei ■

FIGURE 23



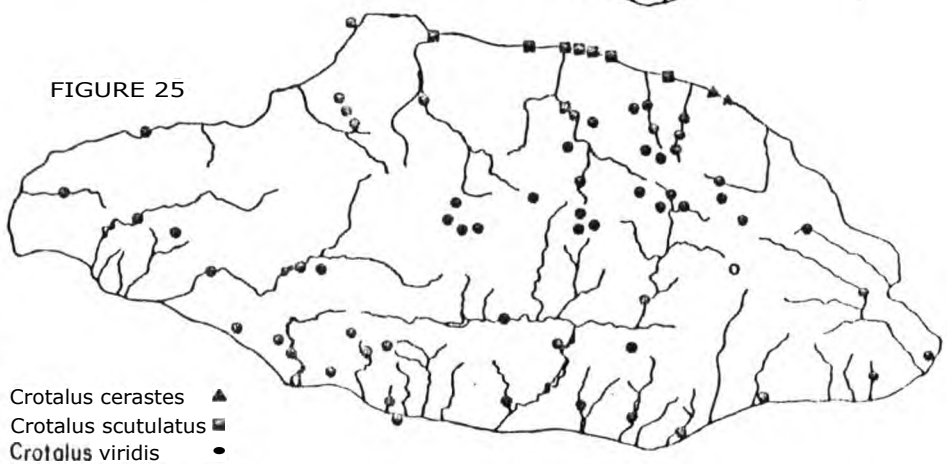
Thamnophis couchi ●
Thamnophis sirtalis ▲

FIGURE 24



Tantilla planiceps a
Trimorphodon vandenburghi ▲
Hypsiglena torquata ●

FIGURE 25



Crotalus cerastes ▲
Crotalus scutulatus ■
Crotalus viridis ●

DISCUSSION

The San Gabriel Range supports populations of reptiles and amphibians derived from four major biotic zones - Sierra Nevada, Coast Range, desert and chaparral. No other mountain range in California is inhabited by such a diversity of forms from all four regions. Two principal factors are responsible for this diversity, the proximity of the San Gabriels to both the Sierra Nevada and Coast Range, and suitable combination of elevation, temperature, precipitation, and soils to support well established stands of nine plant communities. Abundant yellow pine forest and chaparral appear particularly important to maintenance of the diverse fauna.

As indicated by Holdridge's (1947, 1962) evapotranspiration ratio, the extreme communities, Joshua tree woodland and riparian woodland have the largest number of restricted species. Chaparral, an intermediate community, has the largest fauna, but none of the species is restricted to it. Typically, the chaparral species are highly adaptable, whereas the forms living in riparian and Joshua tree associations are the least adaptable.

The adaptable components of the herpetofauna are associated with many plant communities on both the desert and coastal slopes of the mountain range. Among the amphibians, *Bufo boreas* and *Hyla regilla,* are the most widespread. *Ensatina eschscholtzi* is the most adaptable salamander. Of the lizards, *Sceloporus occidentalis* and *Uta stansburiana* are found in all plant communities. Almost as ubiquitous is *Cnemidophorus tigris,* but the cold winters of the higher altitudes probably exclude this lizard from the yellow pine forest. The most widespread snakes are *Pituophis meZanoleucus* and *Masticophis lateralis,* which are common in all plant communities. Locality records indicate that snakes are less abundant now than in the past. Gopher snakes in particular have shown a decrease in numbers that is most likely a direct manifestation of encroaching civilization.

Steep slopes in the San Gabriels and an absence of flatlands have excluded two major habitats present in adjacent mountain areas, oak savannah and pine flats, and this apparently excludes certain species. *Charina bottae* and *Ensatina eschscholtzi croceater* should occur on pine flats and *Thamnophis sirtalis* probably would be found in oak savannah. In addition, *Eumeces gilberti* and *Coluber constrictor,* rare in the San Gabriels, probably would be more abundant if oak savannah were present.

The herpetofauna of adjacent mountain ranges are similar to that of the San Gabriel range because of similar affinities within the Arcto-Tertiary and Madro-Tertiary geofloras. The San Bernardino range also has a herpetofauna composed of Sierran, Coast Range, desert, and chaparral species. However, amphibians of Arcto-Tertiary relationships, such as *Aneides lugubris* and *Batrachoseps attenuatus,* have been unable to reach the San Bernardino range, probably because of extensive arid areas at the eastern end of the San Gabriels and the adjoining western end of the San Bernardinos. Yellow pine forest of the San Bernardino Mountains is more lush than that of the San Gabriels and supports *Ensatina eschscholtzi croceater* and *Charina bottae.* The Tehachapi Mountain herpetofauna is less similar to that of the San Gabriels because Coast Range immigrants are lacking, and the general aridity and low elevations contribute to an absence of amphibians. Most amphibians including *E. e. croceater* are concen-

trated on Mount Pinos, the highest peak of the Tehachapi range, on which persists a small stand of yellow pine forest.

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