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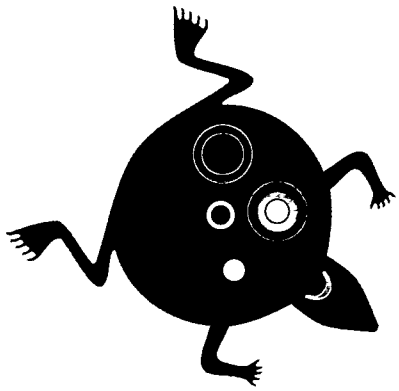
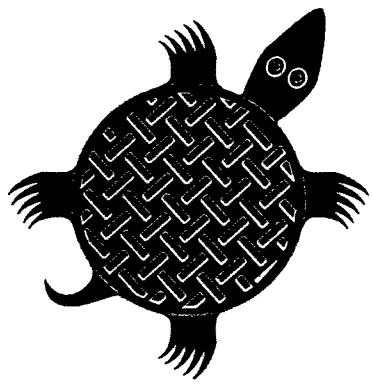
# Amphibians and Reptiles of Los Alamos County







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*...ject has extended over a number of years and thus, a number of summer students helped. Howard Snell and Lee ... ...ed the original pit-fall trap arrays with the help of Kathy Bennett, Brenda Edeskuty, and Timothy Hoar... ...at have helped in the data collection and information gathering included Lee Pierce, Esther Nelson, ... ...s Hathcock, Carrie Vieira, Jennifer Tenbrink, and Hilary Clay. Other people have also collected data valuable to the study. These include Louise Trippe, Charlie Painter, Marilyn Altenbach, and Juanita Lo...man. Charles Bogert, no... ...sed, gave me photographs from his early surveys. Of course, a publication is not possible without the editors, g... designer, and illustrators. Without their help these products would not be completed.*

*Editing: Hector A. Hinojosa*
*Graphic Design: L. Kim Nguyen Gunderson*
*Prepared by: Wendy Burditt*
*Photography Credits: Teralene S. Foxx, Los Alamos National Laboratory; Charlie Painter, New Mexico Department of Game and Fish; Esther Nelson, New Mexico State University; Garth Tietjen, Los Alamos National Laboratory; Doug Burkett, White Sands Missile Range; Don Sais, photographer; and Stock Photos*
*Drawings: Teralene S. Foxx, Los Alamos National Laboartory and Garth Tietjen, Los Alamos National Laboratory.*
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# Amphibians and Reptiles of Los Alamos County, New Mexico

by
Teralene S. Foxx
Timothy K. Haarmann
David C. Keller

Los Alamos
NATIONAL LABORATORY

Los Alamos, New Mexico 87545

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# Amphibians and Reptiles of Los Alamos County, New Mexico


## ABSTRACT

Recent studies have shown that amphibians and reptiles are good indicators of environmental health. They live in terrestrial and aquatic environments and are often the first animals to be affected by environmental change. This publication provides baseline information about amphibians and reptiles that are present on the Pajarito Plateau. Ten years of data collection and observations by researchers at Los Alamos National Laboratory, the University of New Mexico, the New Mexico Department of Game and Fish, and hobbyists are represented.


## 1.0 Introducing Amphibians and Reptiles

### 1.1 About the Study

This publication represents approximately 10 years of data collection and observations by a number of researchers working at Los Alamos National Laboratory (LANL), the University of New Mexico, the New Mexico Department of Game and Fish, and hobbyists. The purpose of the guide is to compile what we know about amphibians and reptiles so that the researcher, the layman, and the hobbyist can identify and protect these important groups of animals. There is considerable myth and lore around many amphibians and reptiles. This leads to fear, misunderstanding, and lack of knowledge of amphibian and reptile species. This publication also provides a baseline to understand what species of amphibians and reptiles are present within the habitats of the Los Alamos National Environmental Research Park, LANL, so that we can better manage the ecosystems in which they live to maintain biological diversity.

In the species profiles (Section 6.0), we have included all species that have been identified in the area by various researchers. Additionally, we have included information on some species that have not been identified but are found in adjoining counties and likely occur within Los Alamos County.

### 1.2 About Amphibians and Reptiles

Amphibians include salamanders, toads, and frogs. There are 350 species of salamanders and 3500 species of frogs and toads worldwide. Reptiles include turtles, lizards, alligators, and snakes. There are over 6000 species of reptiles living in a variety of habitats worldwide.

#### 1.2.1 Amphibians

The name amphibian means "those who lead a double life." The name describes a group of species that spend part of their life cycle in water and part on land. What would a spring and summer night be without the call of the frog or toad from its watery habitat? Amphibians belong to an ancient group that dominated the planet over 300 million years ago and were the first vertebrates that could live both in water and on land.

Most amphibians have the following characteristics:

They have naked skin not covered by fur, feathers, or scales.
The skin is smooth or rough, wet or dry, or slimy.
They have toes but no claws.
The skin contains many glands.
They are ectotherms (body temperature conforms to environmental conditions).
Water is absorbed through the skin.
Larvae have gills, adults have lungs.

Frogs, toads, and salamanders breath air and have no internal control of their body temperature, thus are affected by the heat and cold of the outdoor environment. They will move between sunlight and shade to regulate body temperature. They are highly adaptable, living in habitats ranging from tropical to sub-Arctic, and are tolerant of low temperatures. If temperatures are high and the environment is dry, certain groups such as salamanders and spadefoots can go into dormancy.

As a group, most amphibians are carnivorous, feeding on worms, insects, spiders, or other amphibians, including their own kind. The frogs and toads are specialized in their ability to feed. Their eyes, tongue, and teeth work together to capture prey.

### 1.2.2 Reptiles

Reptiles include turtles, lizards, crocodiles, alligators, and snakes. This incredible group of animals became the first vertebrates to live on land during Paleozoic times over 250 million years ago. Nearly every child and many adults are fascinated by the thought of dinosaurs wandering through hills and valleys of the Cretaceous times. The descendents of these large and small creatures live in nearly every environment except cold places and at high altitudes.

Reptiles are distinguished from other vertebrates by the following characteristics:

They have skin covered with tough scales.
They have claws on their toes.
Eggs have a flexible, leathery shell.
At least one lung is present.

As a group, reptiles eat a variety of food. Many lizards eat insects (insectivorous); turtles are most often herbivorous; and snakes eat living prey (carnivorous). Reptiles have various reproductive strategies. Some lay eggs, bury them, and abandon them. Yet, others bear live young.

Reptiles are also ectotherms. Their behavior is adjusted to maintain body temperatures throughout seasonal variations. When they bask in the sun they can absorb heat, which keeps them mobile and active as well as increasing digestion. When temperatures are too hot such as in

desert and semiarid environments, many species will live in burrows, among rocks, or buried in sand. Most become dormant during seasons that are not conducive to their body rhythms.

Nearly all reptiles are wary and secretive, their abundance is often much greater than expected. Most snakes and some lizards are active primarily at night (nocturnal) or only during evening and morning hours (crepuscular). Most lizards and turtles are active during daylight hours (diurnal).

## 2.0. Importance of Amphibians and Reptiles

Amphibians and reptiles have historically been underrepresented in environmental monitoring programs because of their small body or populations sizes, fossorial or cryptic habitats, patchy distribution, and unpredictable seasonality (Gibbons 1988). Additionally, they have secretive habits during the non-breeding season and complex life cycles that make them difficult to study. Amphibians, such as terrestrial salamanders, pose problems in monitoring because of limited ranges, patchy distribution, and a retiring nature (Brooks 1996). In arid and semiarid environments, studies have particular difficulties, primarily with the timing and duration of the existence of standing water (Sredl et al. 1996). Sredl et al. indicate that there is a great need for conservation studies of amphibians.

As part of the nongame fauna, amphibians and reptiles are of less interest to the public. However, recent studies have shown that amphibians and reptiles are good indicators of general environmental health. Anurans (frogs and toads) are valuable as indicator species capable of integrating environmental changes occurring in both the terrestrial and aquatic phases of their habitats. Furthermore, because they occupy small ponds and shallow margins of lakes, anurans are likely to be the first vertebrates to come in contact with contaminated run-off or acidified snowmelt. This makes them useful as an early warning detection system for environmental contamination because these animals are especially sensitive to pollution and loss of aquatic habitat (Campbell 1976, Hall 1980). Studies related to radiation hazards to amphibians and reptiles indicate that acute radiation exposure adversely affects limb regeneration, alters DNA metabolism, and increases the frequency of chromosomal aberrations (Eisler 1994). Various amphibian populations have been found to be sensitive to acidic deposition (Freda et al. 1991).

Part of the problem in monitoring the declines in amphibian and reptile populations is that much of the past information is anecdotal, that is, no documentation exists, only verbal reports. Therefore, studies are needed to establish baseline information. Not only is it important to develop studies that can monitor these fluctuating populations, but also to develop monitoring networks so the question of declining populations can be investigated.

Conservation concerns for amphibians and reptiles began to surface in 1977 when Tom van Devender, in letters to the Arizona Game and

Fish Department and the U.S. Forest Service, expressed concern for the probable extinction of the Sycamore Canyon population of the Tarahumara frog (*Rana tarahumarae*) (Scott 1997). By the 1980s, scientists began to recognize that amphibians, particularly frogs and toads, from widely separated parts of the world were declining, suggesting some far-reaching environmental change or cause rather than simple natural fluctuations in population densities (Stebbins and Cohen 1995). In the past decade, various studies investigated the causes for these declines, which may include fungal infections or changes in solar radiation. Species like leopard frogs (*Rana* spp.) that were once common have declined, and local extirpation has occurred because of many factors, including changes in habitat; predation; competition with introduced species like the bullfrog (*Rana catesbeiana*), exotic fishes, and crayfish; commercial or scientific exploitation; toxicants; acid rain; pathogens; and parasites (Clarkson and Rorabaugh 1989, Hayes and Jennings 1986, Fernandez and Rosen 1996). There have been numerous articles or reports of declining amphibians in FROGLOG, the newsletter of the World Conservation Union, Species Survival Commission, Declining Amphibian Population Task Force.

Amphibians and reptiles are important in food chains, and they make up large proportions of vertebrates in certain ecosystems (Bury and Raphael 1983). Because of recent concern for nongame wildlife, biologists and land managers find themselves faced with studies and management needs for a group of animals they know little about (Jones 1986).

### 3.0. Amphibians and Reptiles on the Pajarito Plateau

The State of New Mexico and the Pajarito Plateau have amphibian and reptilian fauna typical of semiarid regions. Table 1 compares the numbers of species confirmed to occur on the Pajarito Plateau with the total numbers found in the State of New Mexico (Degenhardt et al. 1996). Each species of the Pajarito Plateau is separately discussed in the following species accounts.

Table 1. Number of Amphibian and Reptile Species on the Pajarito Plateau and in the State of New Mexico

| Herptofauna | New Mexico | Pajarito Plateau |
|---|---|---|
| Salamanders | 3 | 2 |
| Frogs and Toads | 23 | 5 |
| Lizards | 41 | 11 |
| Turtles | 10 | 0 |
| Snakes | 46 | 12 |
| TOTAL | 123 | 30 |

### 3.1 Early Studies of Amphibians and Reptiles on the Pajarito Plateau

Few studies of amphibians and reptiles have been conducted on the Pajarito Plateau. Degenhardt (1975) and his colleagues collected in Bandelier National Monument in the 1970s. The first known survey of LANL lands was done by Charles Bogert. Bogert collected specimens primarily within Pajarito and Sandia Canyons in 1978 and 1979 for the 1979 Site-wide Environmental Impact Statement. Species located during his surveys are included in Table 2. Bowker and Ferenbaugh (1983) and Bowker et al. (1986) did studies on thermal regulation of several species of lizards including plateau striped whiptail (*Cnemidophorus velox*), Chihuahuan spotted whiptail (*C. exsanguis*), prairie lizard (*Sceloporus undulatus*), collared lizard (*Crotaphytus collaris*), and tree lizard (*Urosaurus ornatus*). Hein and Whittaker (1997) studied the homing of prairie lizards. Hein and Myers (1995) compared methods to estimate population sizes of the same species. Pierce (1996) studied the behavior of the western chorus frog (*Pseudacris triseriata*) and looked at asymmetry. Studies have been conducted to determine the habitat and location of the endemic Jemez Mountains salamander (*Plethodon neomexicanus*) (Ramotnik 1986, Trippe and Haarmann 1996). Trippe and Haarmann did modeling of Jemez Mountains salamander habitats using remote sensing techniques. Further studies were conducted by Ladyman and Altenbach (1998) to determine the relationship of microhabitat conditions to salamander frequency. The locations of various individual sightings have been noted by researchers in association with other studies (Hinojosa 1997, Altenbach and Painter 1998) and reported as incidental sightings by the public. These locations have been recorded in a wildlife database that is maintained by the Ecology group at LANL.

Baseline studies of amphibians and reptiles of the Pajarito wetlands at LANL began in 1990 and have been conducted by the Ecology group for seven years. With the data gathered from 1990 through 1997 (excluding 1992), we have examined the annual and seasonal population changes of four species of amphibians and reptiles. The four species studied are Woodhouse's toad (*Bufo woodhousii*), the western chorus frog, the many-lined skink (*Eumeces multivirgatus*), and the plateau striped whiptail (Nelson et al. 1998). Much of this information gathered during these seven years is incorporated into the species profiles included within this atlas.

### 3.2 Status of the Amphibians and Reptiles

The New Mexico Natural Heritage Program maintains a database that provides a global ranking for various species, both plant and animal. Table 3 gives the rankings that are maintained within their database for the amphibians and reptiles that occur within the area. It should be noted that there is only one species that is considered threatened—the Jemez Mountains salamander. All species on the Los Alamos County list, with the exception of the Jemez Mountains salamander, are considered a G5 ranking, indicating that they, at this time, appear to be globally secure but may be rare within portions of their range. The State of New Mexico also ranks species. Seven species (Table 3)

Table 2. Amphibians and Reptiles found on the Pajarito Plateau

| Common Name | Scientific Name | Source* |
|---|---|---|
| **Lizards** | | |
| Prairie lizard | *Sceloporus undulatus* | 1, 2, 3, 4, 7 |
| Tree lizard | *Urosaurus ornatus* | 1, 2 |
| Collared lizard | *Crotaphytus collaris* | 1, 2 |
| Short-horned lizard | *Phrynosoma douglasii* | 1, 2, 3 |
| Chihuahuan spotted whiptail | *Cnemidophorus exsanguis* | 1, 2, 4 |
| Plateau striped whiptail | *Cnemidophorus velox* | 1, 2, 4 |
| Great Plains skink | *Eumeces obsoletus* | 1, 2, 3 |
| Many-lined skink | *Eumeces multivirgatus* | 1, 2, 3 |
| **Snakes** | | |
| Ringneck snake | *Diadophis punctatus* | 2 |
| Gopher snake | *Pituophis melanoleucus* | 1, 2, 3 |
| Western terrestrial garter snake | *Thamnophis elegans* | 1, 2 |
| Blackneck garter snake | *Thamnophis cyrtopsis* | 1, 2 |
| Night snake | *Hypsiglena torquata* | 1, 2 |
| Western diamondback rattlesnake | *Crotalus atrox* | 1, 2 |
| Western rattlesnake | *Crotalus viridis* | 1, 2 |
| Striped whipsnake | *Masticophis taeniatus* | 1, 2 |
| Coachwhip | *Masticophis flagellum* | 2, 9 |
| Mountain patchnose snake | *Salvadora grahamiae* | 1, 2 |
| Smooth green snake | *Liochlorophis vernalis* | 1, 2 |
| Great Plains rat snake | *Elaphe guttata* | 1, 2 |
| **Salamanders** | | |
| Tiger salamander | *Ambystoma tigrinum* | 1, 2, 3 |
| Jemez Mountains salamander | *Plethodon neomexicanus* | 1, 4, 5, 6, 8 |
| **Frogs and Toads** | | |
| New Mexico spadefoot | *Spea multiplicata* | 1, 2, 3 |
| Woodhouse's toad | *Bufo woodhousii* | 1, 2, 3 |
| Red-spotted toad | *Bufo punctatus* | 1, 2 |
| Western chorus frog | *Pseudacris triseriata* | 1, 2, 3 |
| Canyon treefrog | *Hyla arenicolor* | 1, 2, 3 |
| Bullfrog | *Rana catesbeiana* | 1 |

*(1) Degenhardt et al. 1996, (2) Charles Bogert (1979) and (3) in Pajarito Canyon study, (4) Bowker, et al. (1986), (5) Trippe and Haarmann, (1996), (6) Ladyman and Altenbach (1998), (7) Hein, et al. (1995), (8) Ramotnik (1986), and (9) Painter and Nelson (1998).

Table 3. New Mexico Natural Heritage Program Rankings for Amphibians and Reptiles in Los Alamos County and Vicinity

| Scientific Name | Common Name | Global Rank | State Rank |
|---|---|---|---|
| *Ambystoma tigrinum* | Tiger salamander | G5 | S5 |
| *Plethodon neomexicanus* | Jemez Mountains salamander* | G2 | S2 |
| *Spea bombifrons* | Plains spadefoot toad | G5 | S5 |
| *Spea multiplicata* | New Mexico spadefoot toad | G5 | S5 |
| *Bufo punctatus* | Red-spotted toad | G5 | S5 |
| *Bufo woodhousii* | Woodhouse's toad | G5 | S5 |
| *Hyla arenicolor* | Canyon treefrog | G5 | S4 |
| *Pseudacris triseriata* | Western chorus frog | G5 | S5 |
| *Rana catesbeiana* | Bullfrog | G5 | S5 |
| *Crotaphytus collaris* | Collared lizard | G5 | S5 |
| *Phrynosoma douglasii* | Short-horned lizard | G5 | S5 |
| *Sceloporus undulatus* | Prairie lizard | G5 | S5 |
| *Urosaurus ornatus* | Tree lizard | G5 | S5 |
| *Uta stansburiana* | Side-blotched lizard | G5 | S5 |
| *Holbrookia maculata* | Lesser earless lizard | G5 | S5 |
| *Cnemidophorus exsanguis* | Chihuahuan spotted whiptail | G5 | S5 |
| *Cnemidophorus grahamii* | Checkered whiptail | G5 | S5 |
| *Cnemidophorus inornatus* | Little striped whiptail | G5 | S5 |
| *Cnemidophorus velox* | Plateau striped whiptail | G5 | S5 |
| *Cnemidophorus neomexicanus* | New Mexico whiptail | G5 | S5 |
| *Eumeces multivirgatus* | Many-lined skink | G5 | S5 |
| *Eumeces obsoletus* | Great Plains skink | G5 | S5 |
| *Diadophis punctatus* | Ringneck snake | G5 | S4 |
| *Elaphe guttata* | Great plains rat snake | G5 | S5 |
| *Hypsiglena torquata* | Night snake | G5 | S5 |
| *Lampropeltis getula* | Common kingsnake | G5 | S5 |
| *Lampropeltis triangulum* | Milk snake | G5 | S4 |
| *Liochlorophis vernalis* | Smooth green snake | G5 | S4 |
| *Masticophis taeniatus* | Striped whipsnake | G5 | S5 |
| *Masticophis flagellum* | Coachwhip | G5 | S5 |
| *Heterodon nasicus* | Western hognose snake | G5 | S5 |
| *Pituophis melanoleucus* | Gopher snake | G5 | S5 |
| *Salvadora grahamiae* | Mountain patchnose snake | G5 | S4 |
| *Thamnophis cyrtopsis* | Blackneck garter snake | G5 | S5 |
| *Thamnophis elegans* | Western terrestrial garter snake | G5 | S4 |
| *Thamnophis sirtalis* | Common garter snake | G5 | S4 |
| *Crotalus atrox* | Western diamondback rattlesnake | G5 | S5 |
| *Crotalus viridis* | Western rattlesnake | G5 | S5 |

*This species is listed as a species of concern by the U.S. Fish and Wildlife Service and as threatened by the State of New Mexico.

are ranked S4 indicating they are apparently secure in the State, with many occurrences. The remainder of the species, with the exception of the Jemez Mountains salamander, are ranked an S5, indicating that they are demonstrably secure in the State under present conditions.

### 3.3 Observing

The benefits of amphibians and reptiles are often overlooked. Those kinds of snakes that make their meals of rodents are beneficial in certain areas. The benefits of lizard predation on insects are less obvious but are also helpful. All amphibians and reptiles play a role in the intricate web of life and are thus important elements in their particular habitats and ecosystems.

With the increasing public concern for our vanishing wildlife, the pursuit of herpetology should increasingly emphasize field observation with minimal disturbance. Although presently secure and seemingly widespread, some species are declining from over-collection. Astonishingly little is known about amphibian and reptilian behavior under natural conditions. We should learn to live and let live. Beyond the natural predators, human activity and disturbance are the primary factors driving many species to scarcity. Some species are killed out of fear and misunderstanding. Factors such as habitat destruction, egg collecting as a source of income, and contamination are contributing to declines.

## 4.0 Habitats for Amphibians and Reptiles within Los Alamos County

### 4.1 Regional Description

#### 4.1.1 Location

Los Alamos County is located in north-central New Mexico, approximately 100 km (60 mi) north-northeast of Albuquerque and 40 km (25 mi) northwest of Santa Fe (Figure 1). The County is approximately 283 km$^2$ (109 mi$^2$). LANL comprises 111 km$^2$ (43 mi$^2$) of the County where most of the amphibian and reptile studies have been conducted. The County and its surrounding environments encompass a wide range of environmental conditions. This is attributed in part to the prominent elevational gradient in the east-west direction, diverse topography, and major canyon-mesa complexes.

The spectacular scenery that is a trademark of the Los Alamos area is a result of the prominent elevation gradient of the region. The difference between its lowest elevation in the eastern extremities and its highest elevation on the western boundaries represents a change of approximately1568 vertical meters (5146 feet). At the lowest point along the Rio Grande, the elevation is approximately 1631 m (5350 ft) above mean sea level. At the opposite elevation extreme, the Sierra de Los Valles, which is part of the more extensive Jemez Mountains, forms a continuous backdrop to the landscapes of the study region. The tallest mountain peaks in the Sierra include Pajarito Mountain at 3182 m (10,441 ft), Cerro Rubio at 3185 m (10,449 ft), and Caballo Mountain at 3199 m (10,496 ft).

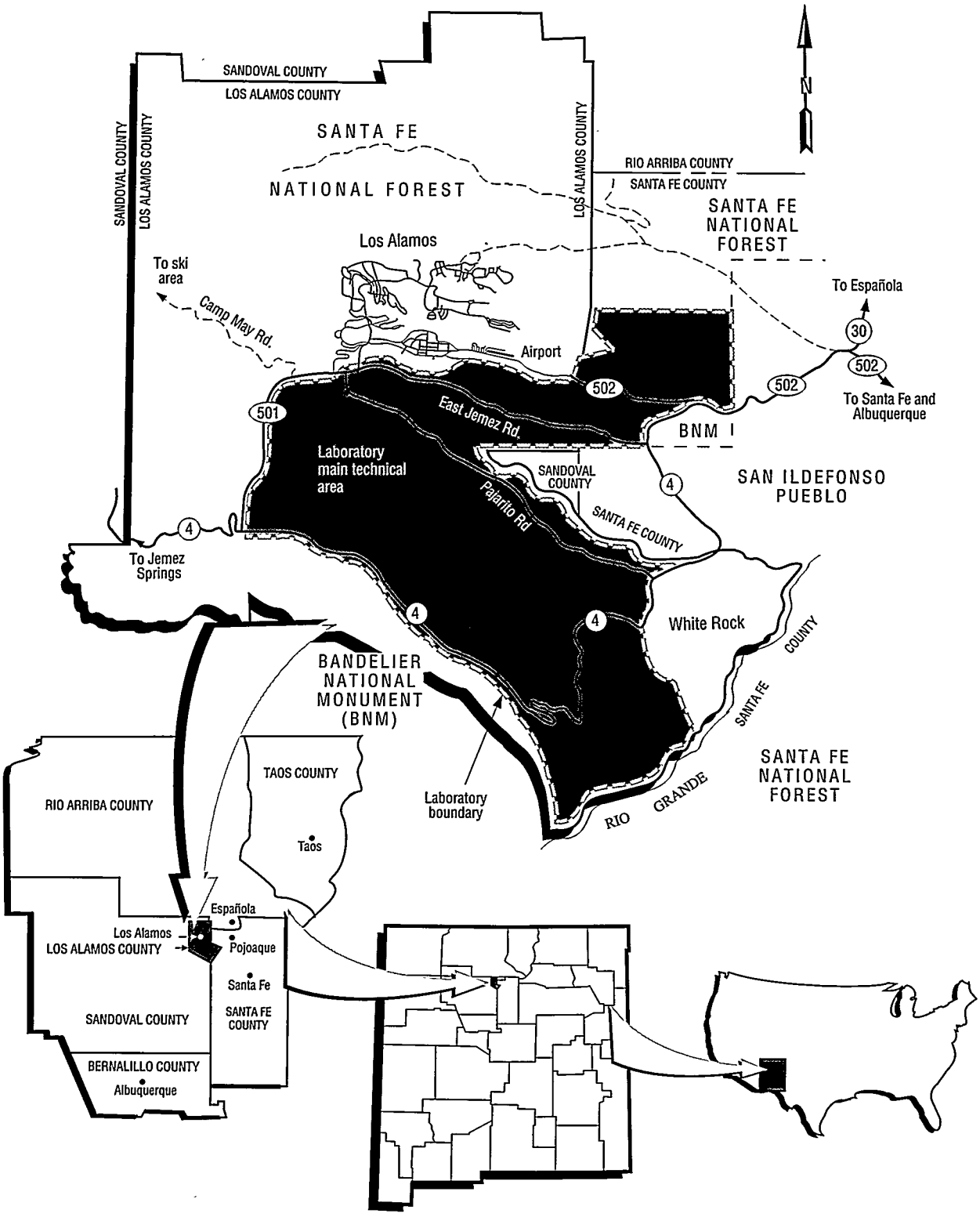



Figure 1. The location of Los Alamos National Laboratory within Los Alamos County.

The Los Alamos region is topographically complex. Within Los Alamos County, there are three main physiographic systems (Nyhan et al. 1978). From east to west, these systems are the White Rock Canyon, the Pajarito Plateau, and the Sierra de los Valles. White Rock Canyon occurs below 1890 m (6200 ft) above sea level. This rugged canyon is approximately 1.6 km (1 mi) wide and extends to a depth of nearly 275 m (900 ft). White Rock Canyon, through which the Rio Grande flows, occupies about five percent of Los Alamos County. The Pajarito Plateau is the largest of the three physiographic systems, occupying nearly 65 percent of Los Alamos County. The Pajarito Plateau is a broad piedmont that slopes gently to the east and southeast. At a more localized scale, the Pajarito Plateau is also topographically complex. The surface of the plateau is dissected into narrow mesas by a series of east-west trending canyons. Above 2377 m (7800 ft), the Sierra de los Valles rises to the western extremity of the study region. These mountains occupy approximately 30 percent of Los Alamos County. The Sierra is also dissected into regularly spaced erosion features, although these canyons in the mountains are not so prominent as the canyons on the Pajarito Plateau.

Most of the mesas in the Los Alamos area are formed from Bandelier Tuff, which includes ash fall, ash fall pumice, and rhyolite tuff. The tuff, ranging from nonwelded to welded, is more than 300 m (1000 ft) thick in the western part of the plateau and thins to about 80 m (260 ft) eastward above the Rio Grande. It was deposited as a result of major eruptions in the Jemez Mountains' volcanic center about 1.2 to 1.6 million years ago.

The County is composed of lands administered by the County of Los Alamos, LANL, and Santa Fe National Forest. Bandelier National Monument borders the County on the south, the Pueblo of San Ildefonso borders the Laboratory to the east, and the Pueblo of Santa Clara is on the north.

On the western part of the Pajarito Plateau, the Bandelier Tuff overlaps onto the Tschicoma Formation, which consists of older volcanics that form the Jemez Mountains. The tuff is underlain by the conglomerate of the Puye Formation in the central plateau and near the Rio Grande. Chino Mesa basalts interfinger with the conglomerate along the river.

Surface water in the Los Alamos area occurs primarily as short-lived or intermittent reaches of streams. Perennial springs on the flanks of the Jemez Mountains supply base flow into upper reaches of some canyons, but the volume is insufficient to maintain surface flows across the Laboratory site before they are depleted by evaporation, transpiration, and infiltration. Runoff from heavy thunderstorms or heavy snowmelt reaches the Rio Grande several times a year in some drainages. Effluents from sanitary sewage, industrial waste treatment plants, and cooling-tower blowdown enter some canyons at rates sufficient to maintain surface flows for varying distances and creating artificial wetlands.

### 4.1.2. Weather

Los Alamos has a temperate, semiarid mountain climate. However, this climate is strongly influenced by elevation, and large temperature and precipitation differences are observed in the area because of the topography. Los Alamos has four distinct seasons. Winters are generally mild, but occasionally storms dump large snows and cause below-freezing temperatures. Spring is the windiest season of the year. Summer is the rainy season in Los Alamos when afternoon thunderstorms and associated hail and lightning are common. Fall marks the end of the rainy season and a return to drier, cooler, and calmer weather.

Several factors influence the temperature in Los Alamos. An elevation of 2226 m (7400 ft) helps to counter Los Alamos' southerly location, making for milder summers than nearby areas at lower elevations. The sloping nature of the Pajarito Plateau causes cold-air drainage, making the coolest air settle into neighboring valleys and canyons. Also, the Sangre de Cristo Mountains to the east act as a barrier to arctic air masses affecting the central and eastern United States. The temperature does occasionally drop well below freezing, however. Another factor is the lack of moisture in the atmosphere. With less moisture there is less cloud cover, which allows a significant amount of solar heating during the daytime and radiative cooling at night.

This heating and cooling often cause a wide range of daily temperature. Winter temperatures range from -1°C to 10°C (30°F to 50°F) during the daytime to -9°C to -4°C (15°F to 25°F) during the nighttime. The record low temperature recorded in Los Alamos is -28°C (-18°F). Winter is usually not particularly windy, so extreme wind chills are uncommon. Summer temperatures range from 21°C to 31°C (70°F to 88°F) during the daytime to 10°C to 15°C (50°F to 59°F) during the nighttime. Temperatures occasionally break 32°C (90°F).

The average annual precipitation (including both rain and the water equivalent of frozen precipitation) in Los Alamos is 47.6 cm (18.7 in.). The average snowfall for a year is 149.6 cm (58.9 in.); freezing rain and sleet are rare. Winter precipitation is often caused by storms entering the United States from the Pacific Ocean or by cyclones forming or intensifying in the lee of the Rocky Mountains. When these storms cause upslope flow over Los Alamos, large snowfalls can occur. The record snowfall for one day is 56 cm (22 in.), and the record snowfall in one season is 389 cm (153 in.). The snow is usually a dry, fluffy powder, with an average equivalent water-to-snowfall ratio of 1:20. The summer rainy season accounts for 48 percent of the annual precipitation. During the July-September period, afternoon thunderstorms form because of the monsoonal flow of moist air from the Gulf of Mexico and the Pacific Ocean and because of convection and the orographic uplift as air flows up the sides of the Jemez Mountains. These thunderstorms can bring large downpours, but sometimes they only cause strong winds and lightning. Hail frequently occurs from these rainy-season thunderstorms.

### 4.1.3 Plant Communities

The Pajarito Plateau, including the Los Alamos area, is biologically diverse. This diversity of ecosystems is due partly to the dramatic 1500-m (5000-ft) elevation gradient from the Rio Grande on the east to the Jemez Mountains 20 km (12 mi) to the west and partly to the many steep canyons that dissect the area. Five major vegetative community types are found in Los Alamos County: juniper-grassland, piñon-juniper, ponderosa pine, mixed conifer, and spruce-fir. The juniper-grassland community is found along the Rio Grande on the eastern border of the plateau and extends upward on the south-facing sides of canyons at elevations between 1700 and 1900 m (5600 and 6200 ft). The piñon-juniper community, generally in the 1900- to 2100-m (6200- to 6900-ft) elevation range, covers large portions of the mesa tops and north-facing slopes at the lower elevations. Ponderosa pines are found in the western portion of the plateau in the 2100- to 2300-m (6900- to 7500-ft) elevation range. These three communities predominate, each occupying roughly one-third of the Laboratory site. The mixed conifer community, at an elevation of 2300 to 2900 m (7500 to 9500 ft), overlaps the ponderosa pine community in the deeper canyons and on north slopes and extends from the higher mesas onto the slopes of the Jemez Mountains. The subalpine grassland community is mixed with the spruce-fir communities at higher elevations of 2900 to 3200 m (9500 to 10,500 ft). Human-made and natural wetlands and several riparian areas enrich the diversity of plant and animals found on LANL lands. The plants and animals found on or near LANL property include approximately 500 plant species, 29 mammals, 200 birds, 17 reptiles, 7 amphibians, and a large variety of insects. Roughly 20 of these are designated as threatened, endangered, or a species of concern at the federal and/or state level.

## 4.2 Important Habitats of Amphibians and Reptiles

### 4.2.1 Wetlands and Riparian Zones

Wetlands and associated green belts along streams (riparian zones) are considered sensitive and are important habitat for wildlife. This is particularly true in the arid and semiarid environments of the Southwest. Jones et al. (1985) and Jones and Glinski (1985) found that mesic-adapted or upland amphibians were restricted to cottonwood-willow riparian habitats in the Sonoran Desert. This was attributed to the moderating effects of leaf litter and logs, shading of trees, and accumulation of debris from periodic floods (Jones 1988). Jones (1988) conducted studies along the Salt and Hassayampa rivers in Arizona and found a greater species diversity for amphibians and reptiles compared to nonriparian sites. At LANL, analyses done in 1991 showed species of amphibians and reptiles in the Pajarito wetland were much greater than in the dry Cañada del Buey. An estimated one-third of all known species of plants and animals are associated with wetlands and riparian zones. Further estimations indicate that 12% of all plant and animal species found on the federal list of endangered or threatened species heavily depend on wetlands for food or habitat.

### 4.2.2 Talus Slopes and Rocky Canyons

Many reptiles and some amphibians prefer rocky talus slopes for three reasons: to avoid potentially lethal temperature extremes, for communal hibernicula (hybernation areas), and for reproductive activities (Herrington 1988). Talus slopes can be defined as large groupings of weathered rock fragments (typically with an associated cliff face) of the canyons (Herrington 1988). The collared lizard, canyon treefrog, checkered whiptail, and western diamondback rattlesnake are found at lower elevations. Throughout White Rock Canyon, these species can be seen sunning on basalt outcrops, hiding under rocks and vegetation, or basking on the riverbank. At higher elevations the western rattlesnake (found up to over 8000 ft), the prairie lizard, and gopher snake can be found in a variety of habitats, including rocky talus slopes, under trees on mesas, and in pine forests. Within the protective environment of the talus slopes, species can breed, reproduce, and hibernate.

### 4.2.3 Deep Wooded Areas

The higher, moister elevations of the County are potential habitats for the Jemez Mountains salamander (Ladyman and Altenbach 1998, Trippe and Haarmann 1996). This salamander lives in decaying logs and under rocks of primarily the mixed conifer forests and on the moister slopes of the ponderosa pine zone.

### 4.2.4 Rodent Burrows

Rodent burrows provide a refuge from the dry and hot landscape. Species such as the tiger salamander and Woodhouse's toad will use the burrow most of its adult life, leaving to seek out water for breeding. Various snakes, including the gopher snake, use the burrows for shelter and for seeking prey.

## 5.0 Taxonomy of Amphibians and Reptiles

Systematics is the science of naming and classifying organisms. Taxonomic classification provides a unique name for each organism and puts them in a hierarchy of groups (taxa) based on their evolutionary relationships. Names of organisms are in Latin to provide universality and stability. Latin also prevents translating the names into many different languages; regardless of the language the name is associated with the same group of organisms.

The species is the basic category in all classification. Species are defined as populations of organisms that share one or more similarities not found in related species. The name is composed of two words: the first is the genus and the second is the specific name. These names are italicized, and the first letter of the generic name is capitalized (Example: *Hyla arenicolor).*

Common names vary from country to country and even within the same area. Because of this the names are not used in formal scientific identification. We have included both the common name and the scientific name. We encourage you to learn the scientific name.

The general classification of the amphibians and reptiles found in the area is shown in Table 4. The Amphibian Monitoring Program of the Biological Resources Division of the US Geological Survey offices at the Smithsonian Institute has developed a species and coding list of amphibians to help standardize computerized storage, retrieval, and sharing of amphibian monitoring data (McDiarmid 1994). This database can be accessed to determine the latest species and common name information. We have included keys for each Class or Order of amphibians and reptiles in this document. These keys are based not on taxonomic characteristics but on obvious behavioral or structural characteristics. For taxonomic keys, the following references are suggested: Stebbins (1985), Degenhardt et al. (1996), and Smith and Brodie (1982).

### 5.1 Order Caudata: Salamanders

Salamanders are tailed amphibians that appear lizard-like but are distinguished by their lack of scales and claws. They have four limbs, the front limbs with four toes. The skin is moist and continues to grow even after they reach sexual maturity. All species are carnivorous. Salamanders are preyed upon by fish, snakes, small mammals, birds, and other salamanders.

The origin of the name salamander is Arab-Persian meaning "lives in fire." This came from the belief that the yellow and black European salamander could pass through fire unscathed. The fossil record shows that salamanders date to 150 million years ago. They are found exclusively in the Northern Hemisphere (Cogger and Zweifel 1992).

Some salamanders are entirely aquatic, others are terrestrial and return to water to reproduce, while others are entirely terrestrial. Both reproductive types (aquatic and terrestrial) are found in Los Alamos County and the Jemez Mountains. The males deposit a gelatinous spermatophore during mating. This spermatophore is sucked in by the cloacal lips of the females where the sperm remain to fertilize the eggs as they are laid. Some salamanders lay their eggs in water, some on land. The life cycle of the tiger salamander is shown in Figure 2. The female tiger salamander lays eggs—lacking a protective shell but surrounded by a gelatinous layer—in slow-moving or still water. When the larvae hatch they look very different than an adult, having a tail and external gills. After a few days to years, the larvae will undergo metamorphosis to an adult, leave the water, and seek out burrows. The Jemez Mountains salamander lays eggs in moist subterrenean cavities. The young do not undergo metamorphosis but look like small adults.

Table 4. Living Orders, Suborders, and Families of Amphibians and Reptiles in Los Alamos County

| | |
|---|---|
| **CLASS AMPHIBIA** | |
| Order<br>CAUDATA | SALAMANDERS AND NEWTS |
| Suborder Salamandroidea | |
| Ambystomatidae | Mole salamanders |
| Plethodontidae | Lungless salamanders |
| Order<br>ANURA | FROGS AND TOADS |
| Suborder Pelobatoidae | |
| Pelobatoidae | Spadefoots |
| Suborder Neobatrachia | |
| Hylidae | Hylid treefrogs |
| Bufonidae | Toads |
| **CLASS REPTILIA** | |
| SUBCLASS LEPIDOSAUROMORPHA | |
| Order<br>SQUAMATA | SQUAMATES |
| Suborder Lacertilia | Lizards |
| Teiidae | Whiptails |
| Scincidae | Skinks |
| Crotaphytidae | Collared and leopard lizards |
| Phrynosomatidae | Earless, spiny, tree, side-blotched, horned lizards |
| Suborder Serpentes | SNAKES |
| Colubridae | Harmless and rear-fanged snakes |
| Viperidae | Vipers |

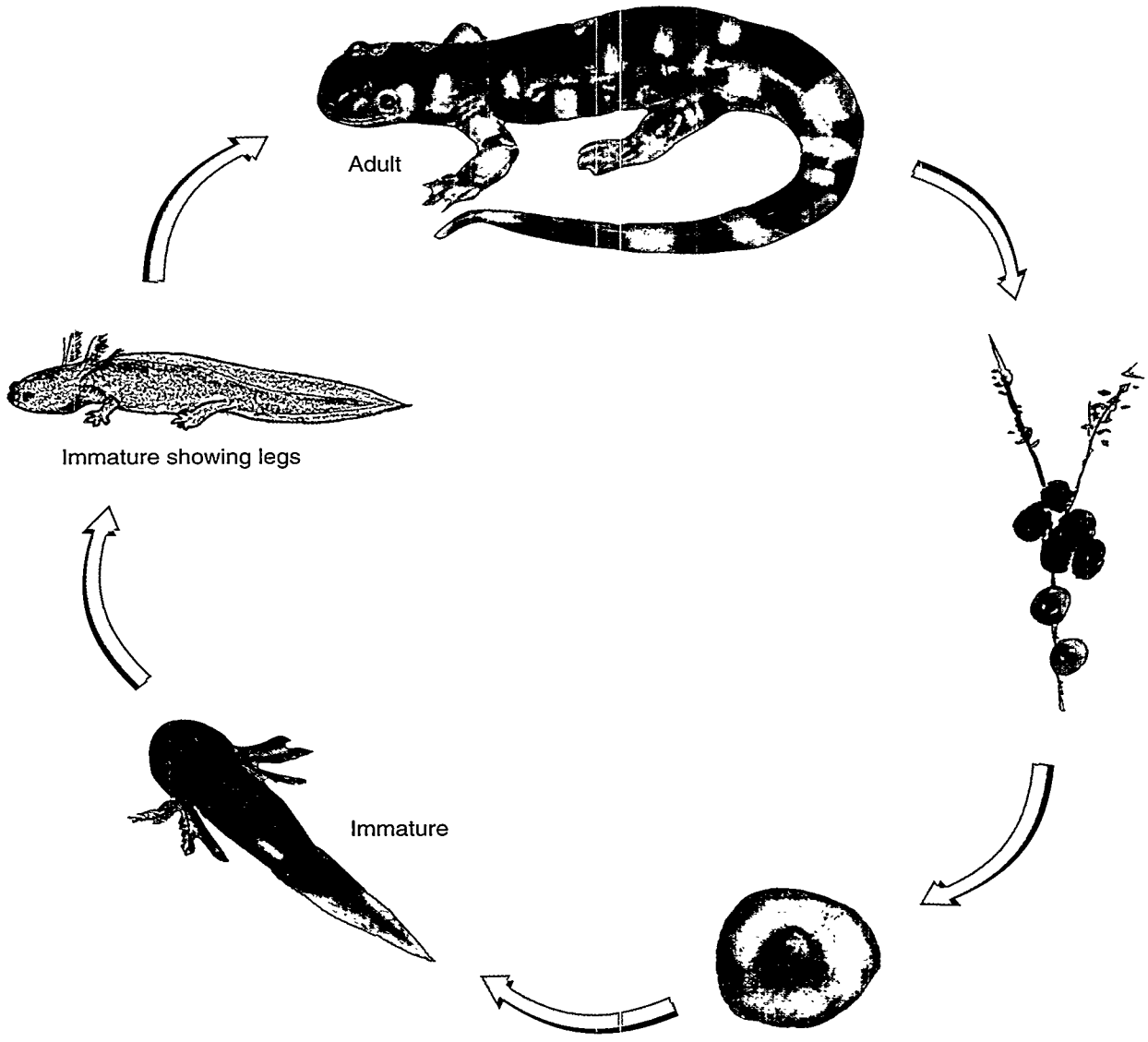



Figure 2. Life cycle of the tiger salamander.

### 5.1.1. Key to the Salamanders

1. Salamander with large stocky body and black coloration with yellow or cream spots. Reproductive stages are found in water. Adults may be found in water, burrows, old buildings, or basements: ***Tiger Salamander.***

2. Salamander is small, brown, and slender. It is found in and under rotting logs or under rocks. Reproductive stages are not found in water: ***Jemez Mountains Salamander.***

## 5.2 Order Anura: Frogs and Toads

In Los Alamos County there are three families and five genera of frogs and toads. Frogs and toads are amphibians that lack tails (Anura means "without tail") and have fully developed limbs in the adult stage. Anurans have four well-developed limbs, no conspicuous tail, and well-developed eyes with lids. There are mucous glands to keep the skin moist. In general, toads are squatty in form and have a rough skin covered with poison glands. Frogs are smooth skinned and streamlined with well-developed, powerful hind legs.

Although frogs and toads exhibit a wide array of reproductive strategies, the typical life history of a frog or toad begins when the eggs are laid in water (Figure 3). The number of eggs can be a few to many thousands. Each egg is individually encased in a gelatinous material, and the eggs are laid in masses under water or as a film on top of the water.

The newly hatched larvae are called tadpoles (French meaning "toad head"). The tadpole has external gills that become covered by the body wall forming spiracles. The tadpole develops a tail that propels it through the water. Each tadpole has mouth parts that are specialized for scraping algae and eating plant material. Although many species may become cannibalistic, most tadpoles are herbivorous, whereas the adults are carnivorous. After a period of time, the tadpole develops legs—hind legs first—and absorbs the tail. Lastly, the forelegs appear, and soon the tadpole becomes a froglet or toadlet that can emerge from the water and enter the terrestrial environment. In the case of the spadefoot, the process of egg to toadlet is very rapid and may be as short as 8 to 10 days. In other species, the process takes much longer.

The mating calls of frogs and toads are often heard throughout the breeding season. Generally, most female Anurans are voiceless. The males force air from the lungs vibrating the vocal sacs. The calls serve to attract females and define territories. The calls are highly species specific, so they can be used to identify the species. Some calls are described in Table 5.

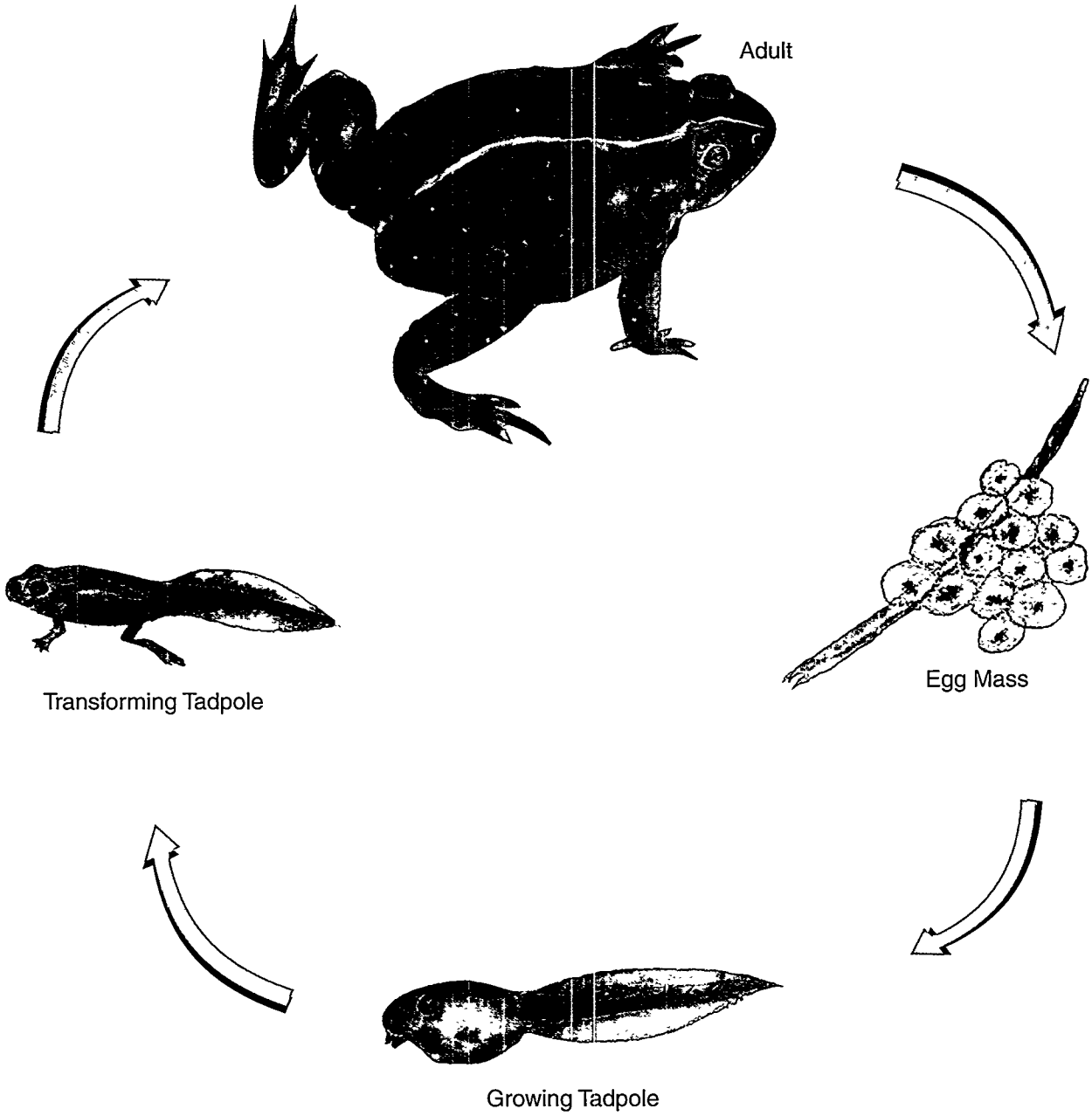



Figure 3. Life cycle of frogs and toads.

Table 5. Species-Specific Calls for Some Frogs and Toads (Smith 1978, Stebbins 1985, and Degenhardt et al. 1996)

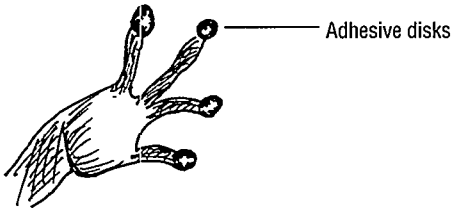
| Species | Location of Calls | Time Period | Characteristics |
|---|---|---|---|
| Canyon treefrog | Canyons | April-June | A slow buzz or trill of 1 to 3 seconds. An explosive, single-pitched whirring that sounds like a rivet gun and lasts 0.5 to 3 seconds. |
| Western chorus frog | Ponds | April-June | Similar to the sound of pulling a thumb over the teeth of a comb. A vibrant 'preeep, preeep' with a rising inflection. |
| Woodhouse's toad | Ponds | April-June | A dissonate trill-like bleat; an explosive wheezy sound lasting 1 to 2.5 seconds. |
| Red-spotted toad | Ponds | April-June | A high-pitched trill lasting 6 to 10 seconds. |
| Spadefoot | Ponds | July | A sharp quack lasting 0.2 to 0.7 seconds. |

Horizontal pupil

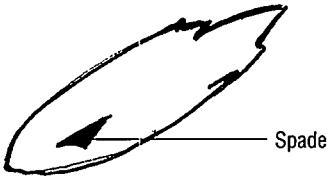
### 5.2.1 Key to Frogs and Toads

1. Small, long-legged frogs with horizontal pupils. (Go to 2)
1. Stout toads, short legs, smooth or warty skin. (Go to 3)

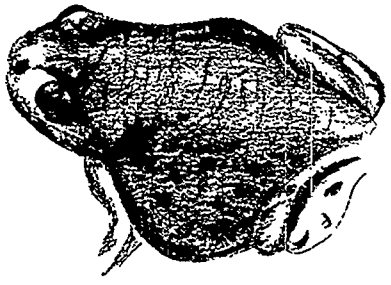
2. A brownish to grayish frog, with a plump body and warty toad-like skin. Toe tips with adhesive discs: ***Canyon Treefrog***
2. A small, brown, olive green, or grayish frog. Adults have a dark stripe that extends from the nostril, through the eye, and above the forelimb to the groin. Toe tips without adhesive discs: ***Western Chorus Frog***



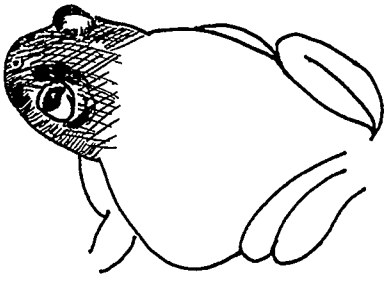

3. Toad with verticle pupils, or "cat-like" eyes, smooth skin, no parotid glands (a gland behind the eye). They have a sharp-edged "spade" on each hind foot: ***Spadefoot***
3. Toad with warty skin, parotid glands, and no sharp-edged "spade" on each hind foot. (Go to 4)



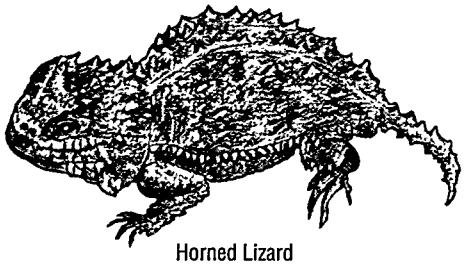

Vertical pupil

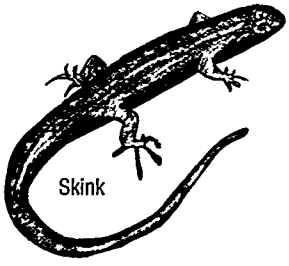


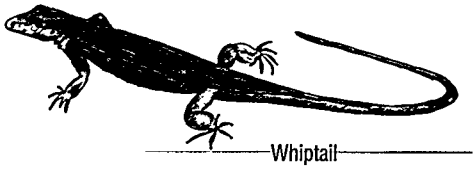
Spadefoot




Collared Lizard


Horned Lizard


Skink


Whiptail

4. Toad with a dorsal white stripe, dry skin with many warts, an oval parotid, and colored gray to olive green. Young may have red spots: ***Woodhouse's Toad***
4. Toads without white dorsal stripe, light gray, olive, or reddish with reddish or orange spots and a round parotid: ***Red-Spotted Toad***

### 5.3 Order Squamata: Scaled Reptiles; Suborder Lacertilia: Lizards

In Los Alamos County and the adjacent Jemez Mountains, there are 11 species of lizards in five families. Lizards are closely related to snakes, but are easily recognized because they have limbs and short bodies. Snakes have no limbs and elongated bodies. Lizards have five toes on each foot and scaly skins, eyelids are movable, and most have an ear opening on each side of the head. Most species are egg-laying, but some, such as the horned lizard, give birth to live young. Most lizards live in the hot, dry areas of the County. The life cycle of the lizard is shown in Figure 4.

#### 5.3.1 Key to Lizards

1. Large agile lizard with long legs and a long tail with a collar around the neck: ***Collared Lizard***
1. Lizard without a collar around the neck. (Go to 2)

2. Lizard with a spine covered body, body is squat: ***Horned Lizard***
2. Lizard may or may not be spine covered, body is not squat. (Go to 3)

3. Lizard with blue blotches on the underside: ***Prairie Lizard***
3. Lizard without blue blotches on underside. (Go to 4)

4. Lizard with distinct head and body. (Go to 6)
4. Lizard with head and body the same width. (Go to 5)

5. Lizard with smooth, flat scales that produce a glossy, silky appearance. Legs are short. Swift runners with sometimes a snake-like movement. Generally found in moist environments: ***Skinks***
5. Lizard not glossy, silky in appearance. Backs either striped or spotted. Tail is twice as long as the body. Legs are long: ***Whiptails***

6. Collar-like crossbar at the shoulders, entire belly is blue, orange, or yellow: ***Tree Lizard***
6. Dark spots on the back. Sides with black bars surrounded by a blue patch: ***Lesser Earless Lizard***

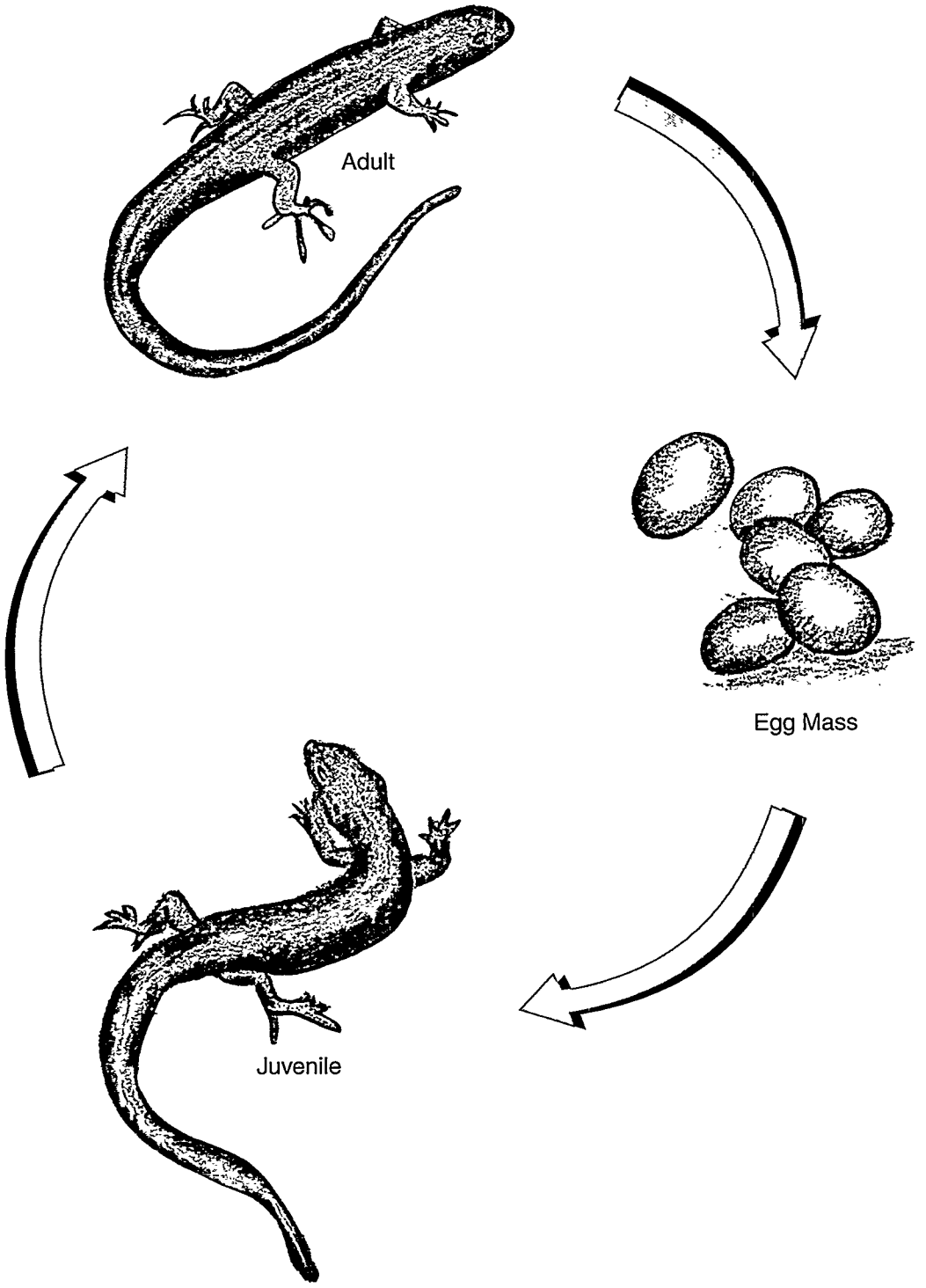
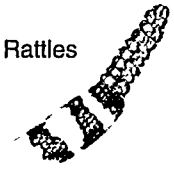


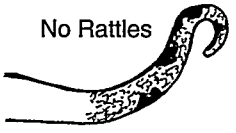

Figure 4. Life cycle of the lizard.

## 5.4 Order Squamata: Scaled Reptiles; Suborder Serpentes: Snakes

Snakes are the most successful of all living reptiles. There are 16 snake species on the Pajarito Plateau and along the Rio Grande. Two families are represented. Snakes lack limbs, ear openings, and eyelids. The upper and lower jaws move separately to swallow large prey whole. Snakes detect prey with their forked tongue and by sensing vibrations through the ground. No snakes are herbivorous. Most are specialized in capturing prey; others have modified teeth to inject poison. The only poisonous snakes of concern in the area are the western diamondback rattlesnake and the western (prairie) rattlesnake. Snakes are found in a variety of habitats from dry to wet; lower as well as higher elevations. Most of the snakes in the area are egg-layers, but some give birth to live young (e.g., garter snakes). The mother does not care for the young, and they must quickly learn to fend for themselves. Behavior differs by species. The gopher snake is active in the day, others such as the night snake are nocturnal.

Smith and Brodie (1982) divide the snakes of the Colubrid family into two subfamilies. Those in the subfamily Colubrinae are divided into various groups based on behavioral characteristics, food habits, and morphology.

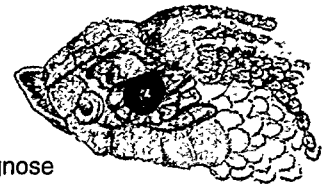

Rattles


No Rattles

### 5.4.1 Key to Snakes

1. Tail with rattles. (Go to 10)
1. Tail without rattles. (Go to 2)

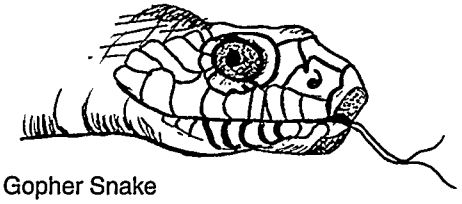
2. Rostral (tip of snout) is modified—much enlarged, turned up, and pointed: ***Hognose Snake***
2. Rostral is normal and not greatly enlarged. (Go to 3)


Hognose

3. Snake has yellow stripe down its back, may be near water but in many moist habitats: ***Garter Snake***
3. Snake does not have the yellow stripe; brightly colored or brown, black, or gray. (Go to 4)

4. Snake is brightly colored—green, orange, or red coloration. (Go to 5)
4. Snake is black, brown, or gray but is not brightly colored. (Go to 6)

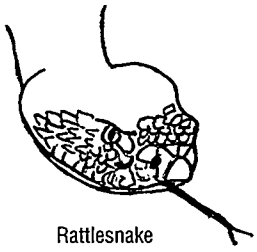
5. Snake has red, white, and black alternating stripes: ***Milk Snake***
5. Snake is not red, white, and black but green. (Go to 8)


Gopher Snake

6. Snake moves rapidly and sometimes climbs trees: ***Whipsnakes***
6. Snake does not move rapidly. (Go to 7)

7. Large slow moving snake, cream or yellow with light brown to dark brown blotches: ***Gopher Snake***
7. Moderately active snake that is black or gray. (Go to 8)

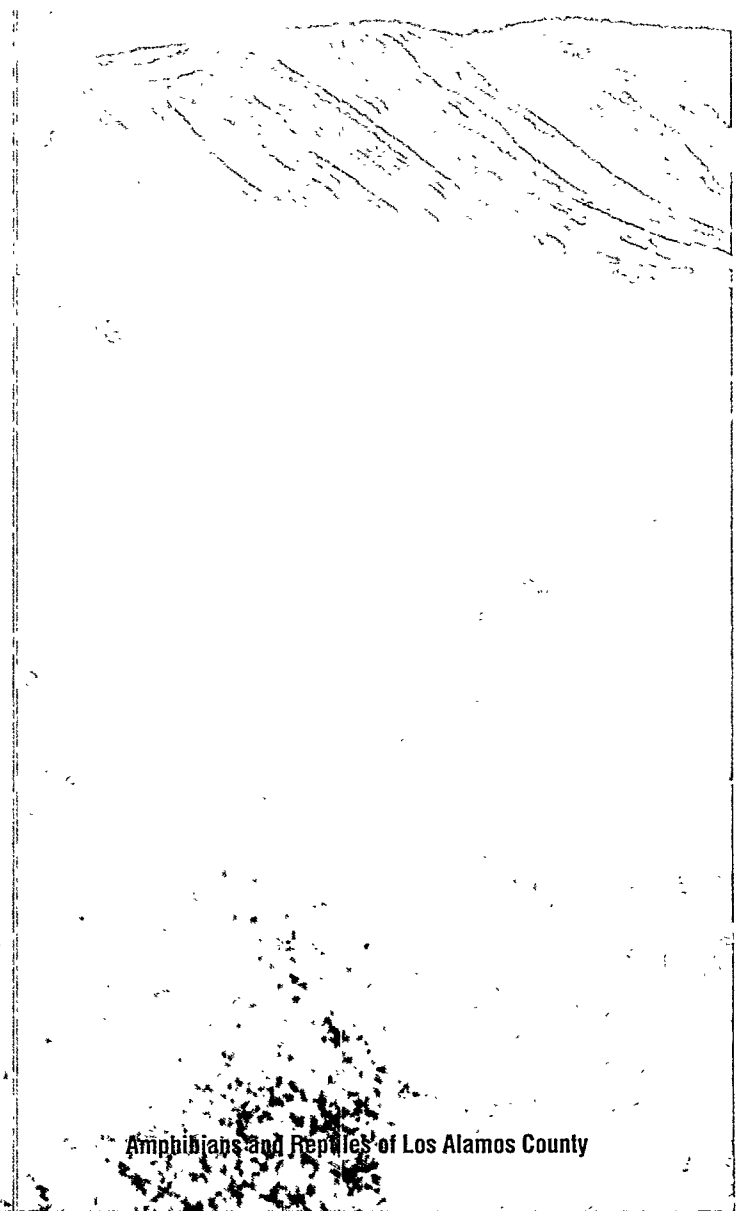
8. Slender-bodied snake that is pale gray, light brown or beige with brown blotches. It is generally active during mornings and evenings. (Go to 9)
8. Snake is all green: ***Smooth Green Snake***



Rattlesnake

9. Snake is large with bands of black or dark brown, white to pale yellow. It is active during morning and evenings: ***Common Kingsnake***
9. Large snake with bands of black or dark brown, white to pale yellow with rattles on the tail. It is active during morning and evenings. (Go to 10)

10. Snake with black and white bands before the rattle: ***Western Diamondback Rattlesnake***
10. Snake without black and white bands before the rattle: ***Prairie Rattlesnake***



## Salamanders

### Family Ambystomatidae

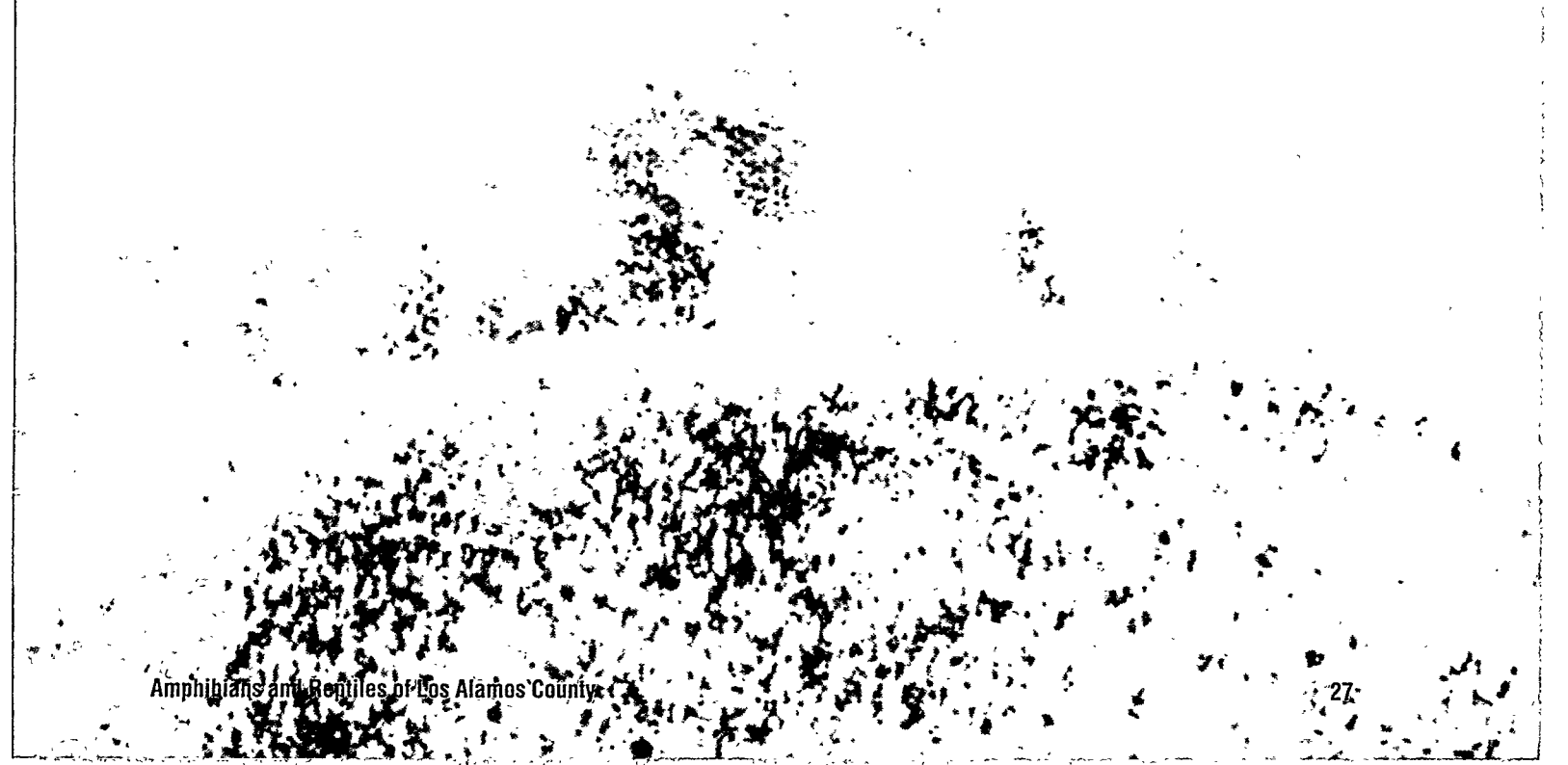
Within Los Alamos County there is one species of mole salamanders. These salamanders live their entire life underground, emerging only to reproduce. The eggs of the mole salamanders are laid in the water and hatch into free swimming larvae called waterdogs.

- Tiger salamander *(Ambystoma tigrinum)*

### Family Plethodontidae

The Jemez Mountains is the location for the endemic Jemez Mountains salamander, the only species in this family found in the area. This family is a group of lungless salamanders that breath through mucous membranes of the mouth and throat and through the skin. They seek shelter in caves, crevices in rocks, spaces between roots and stones, or within or under logs. Eggs are laid in rotting logs and rock crevices, although eggs of the Jemez Mountains salamander have never been located in the wild. The Jemez Mountains salamander is considered a species of concern by the US Fish and Wildlife Service and as threatened by the New Mexico Department of Game and Fish (NMDGF 1994).

- Jemez Mountains salamander *(Plethodon neomexicanus)*

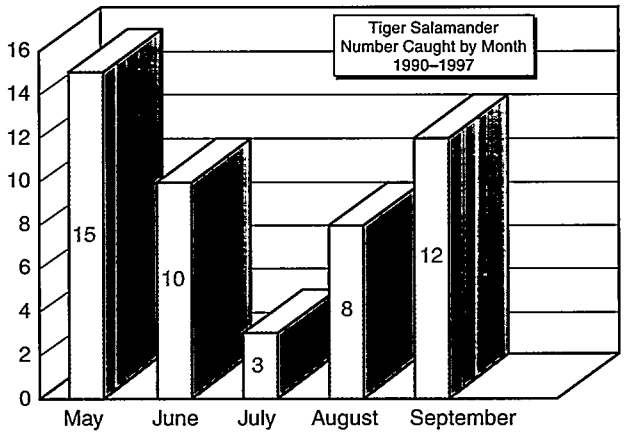


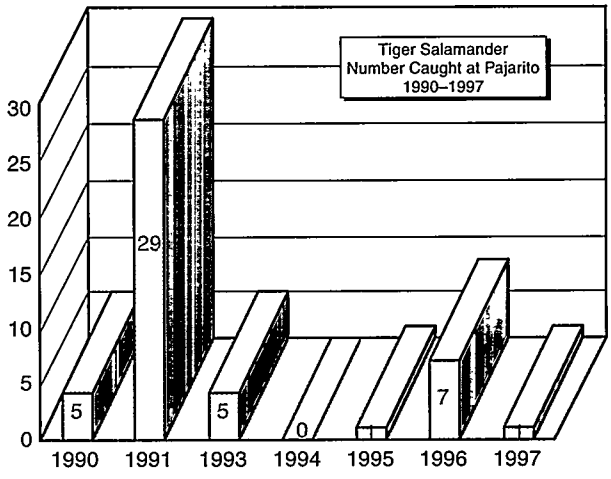
# Tiger Salamander

| | |
|---|---|
| Family: | Ambystomatidae |
| Common Name: | Mole Salamanders |
| Scientific Name: | *Ambystoma tigrinum* |
| Common Name: | Tiger Salamander |

*Note the rounded snout and small eyes.*

The range of this species stretches from the east coast to the west coast of North America, north to southern Canada, and south to Puebla, Mexico. In the spring after snow melt, these large, colorful salamanders can be found breeding in ponds, pools, and slow moving streams of Los Alamos County, including sewage lagoons. They are found at all elevations and have been noted in ponds at 2700 m (9000 ft) and sewage lagoons at 1950 m (6500 ft). Within the Pajarito wetlands, they are most commonly encountered in May and September. Generally, 2 to 5 captures were made each year, except for 1991, a very wet year. The numbers of captures were the least in 1994 and 1995, the driest years. Because of technical problems and hungry racoons, data for 1992 were unreliable and are not included.

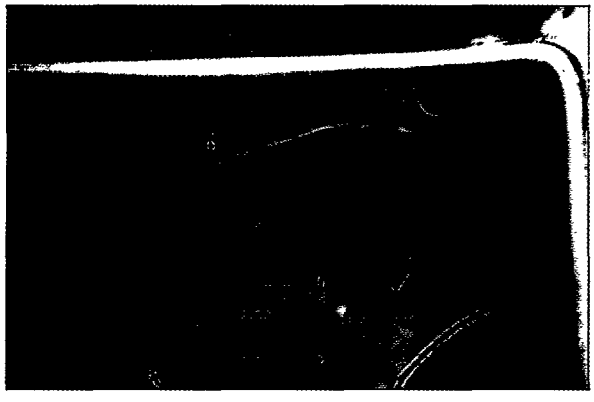


The mature adult has a large stocky body (15 to 40 cm [6 to 13 in.]), small eyes, and a rounded snout. Its color and skin pattern will vary according to where a population is located. Over much of its range, markings will consist of spots and bars of white, cream, or yellow on a black background.

During the breeding season, males arrive at slow moving streams first. The male produces a spermatophore then guides the female to it where she picks it up between the lips of her cloaca to fertilize her eggs. Eggs are laid from mid-March to mid-August, usually later in the season at higher elevations. The eggs hatch within 2 to 5 weeks. The immature emerge looking like tadpoles with distinct external gills. As they begin to metamorphose, the immature develop legs and are sometimes called "waterdogs."

The adults are primarily burrowing animals and are active above ground only during wet periods. They can be found in animal burrows where the relative humidity is high. We have had them reported from under porches and in basements of buildings. The tiger salamander is a ravenous consumer of other amphibians, small mice, earthworms, and large insects.



*(Clockwise from upper left): note the coloration and patterns; higher elevation individual without pattern; the external gills of this immature salamander.*

# Jemez Mountains Salamander

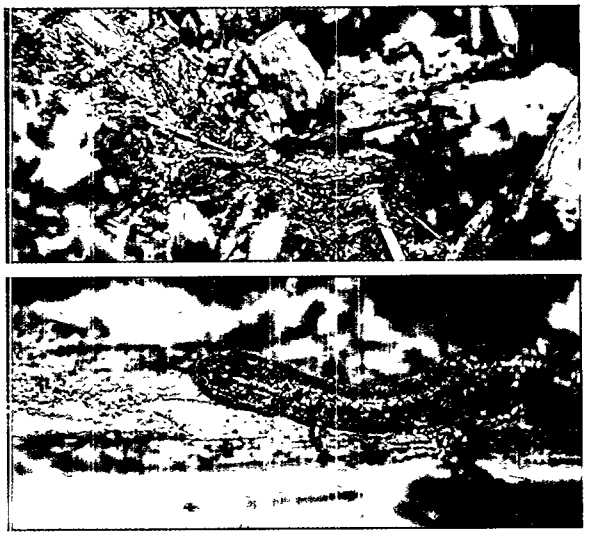
| | |
|---|---|
| Family Name: | Plethodontidae |
| Common Name: | Lungless Salamanders |
| Scientific Name: | *Plethodon neomexicanus* |
| Common Name: | Jemez Mountains Salamander |

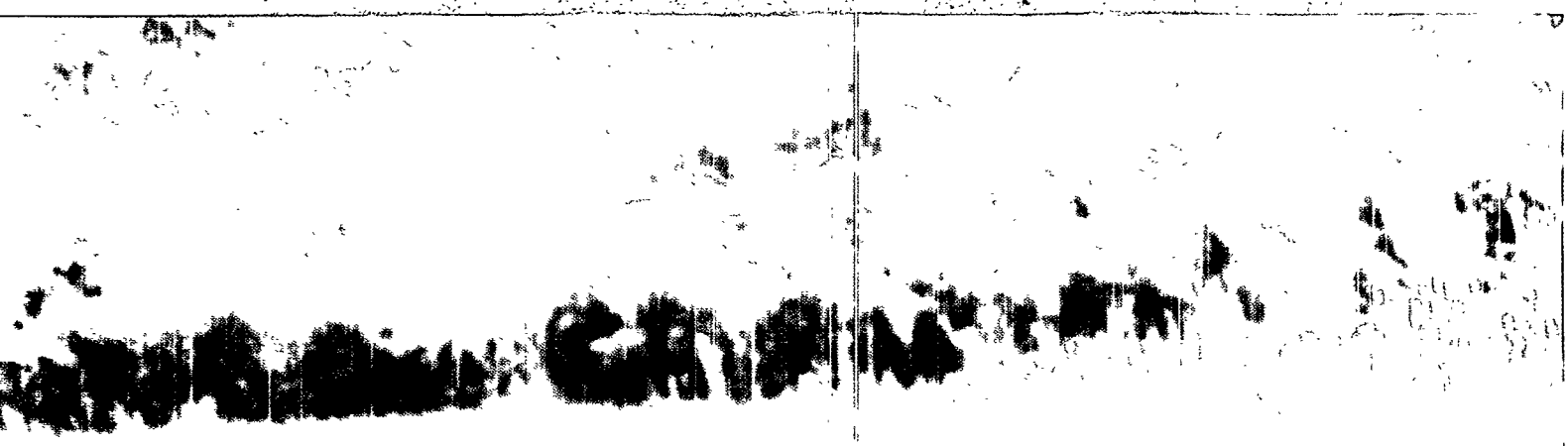
This species is only found in the Jemez Mountains and is common only where specific microhabitat occurs. They are considered a species of concern by the US Fish and Wildlife Service and as threatened by the New Mexico Department of Game and Fish (NMDGF 1994).

These salamanders lack lungs and breathe through mucous membranes in the mouth and throat and through the skin. This dark brown salamander is slender and elongate—very much resembling a worm with legs and eyes—and the body length is about 82.3 mm (3.3 in.) long—about the distance across the palm of one's hand. The tail may be as long as the body, which could make the total length of this salamander 135 mm (5.3 in.). The species is generally found in rocky soils at elevations between 2200 and 2900 m (7260 and 9570 ft). They are found in and under rotting coniferous logs or under rocks on both flat areas and steep slopes in a habitat that is dominated by mixed conifer. A study conducted by the NM Natural Heritage Program for Los Alamos National Laboratory has looked at the microhabitat to correlate the presence of salamanders with specific vegetation.

Studies indicate that the salamander eats ants, although flies, pseudoscorpions, beetles, flies, annelid worms, mites, and snails are also important in the diet.

*This species spends most of its time underground and seldom leaves the shelter of rotting logs.*





## Family Ranidae—True Frogs

Ranid frogs are the familiar frogs found along freshwater streams and lakes. In Los Alamos they are most likely associated with the Rio Grande. The hind legs are long and powerful, and the feet have webbed toes. In all species reproduction occurs in two stages–eggs that are laid in water and emergent tadpole–that may last from several weeks to two years. In New Mexico, the genus *Rana* is the only representative of this family.

- Bullfrog (*Rana catesbeiana*)

## Family Pelobatidae—Spadefoots

In Los Alamos County two species of spadefoots have been reported. These are toad-like burrowing frogs that are adapted to arid conditions. They are distinguished from true toads by their cat-like eyes, the single black, sharp-edged "spade" on each hind foot, teeth in the upper jaw, and rather smooth skin; parotid glands are absent or indistinct. The pupils are vertical in bright light and round at night. This distinguishes them from true toads that have horizontal pupils, two rounded brown tubercles on each foot, no teeth, a warty skin, and large parotid glands.

Spadefoots are explosive breeders. During dry seasons they bury themselves in self-made burrows or those of gophers and squirrels. They are chiefly active at night. They burrow by backing into the ground and pushing the dirt with their spades.

- New Mexico spadefoot *(Spea multiplicata)*
- Plains spadefoot *(Spea bombifrons)*

## Family Bufonidae—True Toads

Members of this family are squat-bodied, heavy-set, short-legged toads with numerous wart-like glands on the body and legs.

- Red-spotted toad *(Bufo punctatus)*
- Woodhouse's toad *(Bufo woodhousii)*

## Family Hylidae—Treefrogs

Treefrogs are long-legged, slim-waisted frogs, mostly small in size. They can be arboreal, living in trees. These are long-legged frogs that are powerful jumpers. Some have toe tips expanded into small adhesive disks.

- Canyon treefrog *(Hyla arenicolor)*
- Western chorus frog *(Pseudacris triseriata)*

# New Mexico Spadefoot

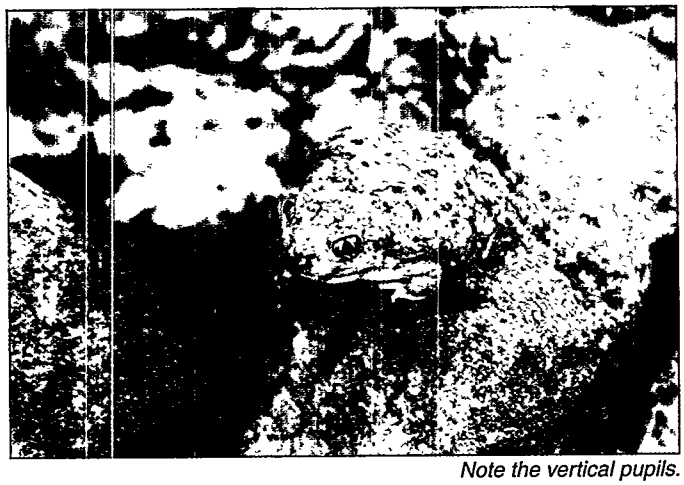
| | |
|---|---|
| Family: | Pelobatidae |
| Common Name: | Spadefoots |
| Scientific Name: | *Spea multiplicata* |
| Common Name: | New Mexico Spadefoot |

The distribution of the New Mexico spadefoot ranges from western Oklahoma and central Texas to Arizona and south into Mexico. Throughout New Mexico, this species is encountered in favorable habitat from elevations of 900 to 2600 m (2970 to 8580 ft).

All spadefoots have smooth skin and darkened horn spades on their hind feet. All members of the family have vertical pupils, and all have free-living aquatic tadpoles. This species is recognized by dark, irregular blotches on a yellowish or greenish back. There is no raised area between the eyes, and the eyelids are as wide as the space between them. The species is largely nocturnal and spends most of its life buried in the soil, emerging to breed only during summer rains.

Degenhardt et al. (1996) described the spadefoot as "adapted to arid conditions, explosive breeders with short-duration, high-density aggregations that form during periods of summer thundershowers." That indeed seemed to be the case in our study area in 1991 when the spadefoots successfully bred in great numbers—the only year out of the past six. In 1991, ponds formed in Pajarito Canyon in areas that were generally dry. Within a short time the numerous tadpoles began to metamorphose. Everywhere we stepped, in both wet and dry locations, small emergent spadefoots were seen. The one-gallon pit-fall traps were filled nearly to the rim with the 2.5-cm (1-in.) toads. Only one adult spadefoot has been seen in other years.

What causes emergence? Dimmit and Ruibal (1980) found that low-frequency sound and/or vibration, such as caused by rainfall or thunder, are primary cues for emergence. Woodward (1982) reported that more than 90 percent of the breeding generally occurs on the first night following pond formation. The eggs hatch in only 15 hours at 30°C, but in 82 hours at 10°C. Tadpoles metamorphose at approximately 2 cm (0.8 in.). We have investigated the 1991 emergence based on



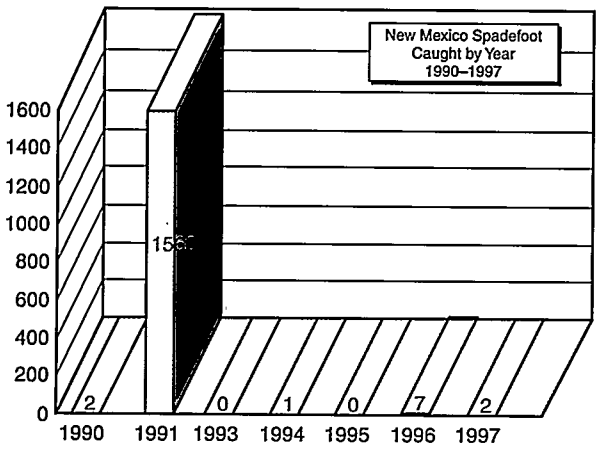
*Note the vertical pupils.*

*Emerged spadefoot*

*Note spade on foot.*

thunder and hail records kept at LANL. There was a hailstorm two days before the emergence. Further investigation is being made.

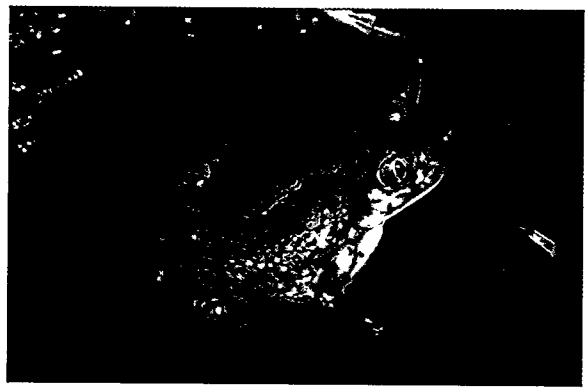
Bogert (1979) collected a spadefoot near pools in Pajarito Canyon near the junction of Three-mile Canyon. The spadefoot was crossing a paved road after a relatively brief but heavy rain had fallen at dusk. The female had already ovulated, but the ponds near where it was collected did not have eggs. He examined the ponds at intervals until the end of September and did not find eggs or larvae.




# Plains Spadefoot

| | |
|---|---|
| Family: | Pelobatidae |
| Common Name: | Spadefoots |
| Scientific Name: | *Spea bombifrons* |
| Common Name: | Plains Spadefoot |

The plains spadefoot is easily confused with *S. multiplicata*, having basically the same coloration—a dorsal greenish-yellow coloration and dark mottling—and the same range in New Mexico—except only up to 2200 m (7260 ft) in elevation. However, the plains spadefoot has a frontal swelling between the eyes and a puglike profile that is not present on the New Mexico spadefoot. The call of the plains spadefoot is a short, distinct, ducklike note lasting 1/3 to 3/4 s, which is shorter and more rapidly trilled than the call of the New Mexico spadefoot.



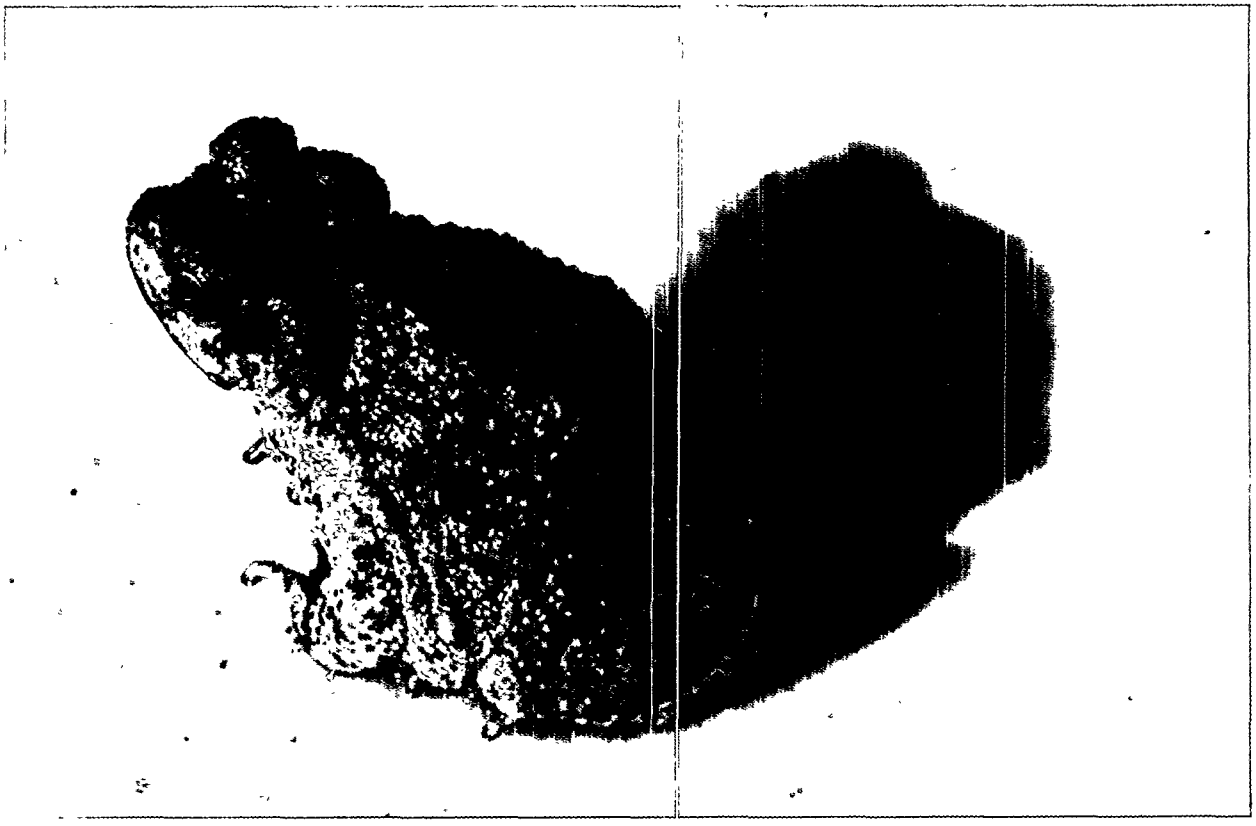
*Plains spadefoot*

# Red-spotted Toad

| | |
|---|---|
| Family: | Bufonidae |
| Common Name: | Toads |
| Scientific Name: | *Bufo punctatus* |
| Common Name: | Red-Spotted Toad |

This species can be found from southeastern California east to central Texas, encompassing the southern tip of Nevada, southern Utah and Colorado, all of Arizona and New Mexico, excluding the north-central highlands, and central Texas. Its range also extends south into Baja California and central Mexico. The red-spotted toad occurs throughout New Mexico from 900 to 2200 m (2970 to 7260 ft). Bogert (1979) in his survey of Pajarito Canyon indicated the presence of red-spotted toad. However, in the past six years we have not found any adults in the Pajarito wetlands. Juvenile Woodhouse's toads (*B. woodhousii*) have red spots and can be confused with the red-spotted toad.

The red-spotted toad is small with a flattened head and body and round parotids, about the same size as the eye. The snout is pointed. Body color is light gray, olive, or reddish brown and has reddish or orange warts. This species is found on floodplains of streams but most often in rocks where it shelters. Its call is a prolonged, clear musical trill, which will be performed by the male while sitting along the edge of the water. It breeds in May through September in temporary or permanent pools of intermittent streams.



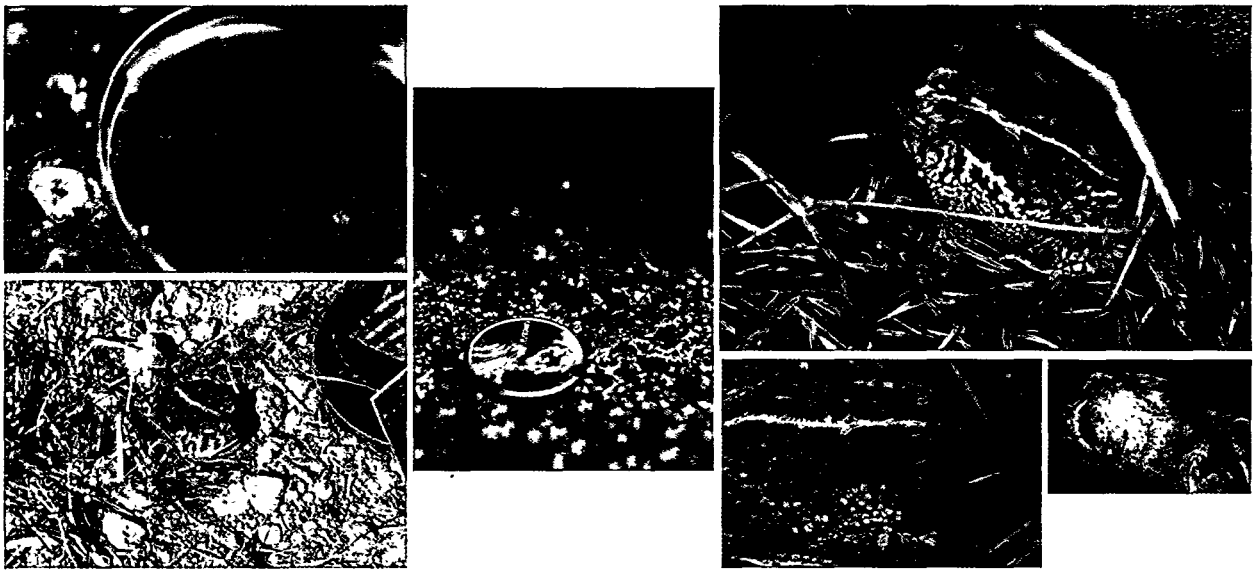
*Adult, note the circular parotid gland behind the eye.*

# Woodhouse's Toad

| | |
|---|---|
| Family: | Bufonidae |
| Common Name: | Toads |
| Scientific Name: | *Bufo woodhousii* |
| Common Name: | Woodhouse's Toad |

The distribution of this toad ranges from northern Montana to Durango, Mexico, and from the Atlantic coast to southeastern Washington, western Utah, and southeastern California. In New Mexico, the range of elevation is from 900 to 2400 m (2970 to 7920 ft), and this toad is the most common toad caught in the Pajarito wetlands. This toad can be identified by its dry skin covered with many warts of different sizes. The overall body color is patterned olive or greenish over a darker color with a light stripe down the middle of the back. The belly is whitish, many times spotted dark on the chest between the forelegs. Each foot has rounded tubercles.

Woodhouse's toad generally lives near permanent water or floodplains, resting in shallow burrows during the day, feeding at dusk and after dark. We have seen the toad bury itself into the soil with just the head emerging. It has been suggested that populations in northwestern New Mexico breed twice each year, corresponding to spring and summer rainfull peaks. Males will spend two nights in a breeding pond, while the females will spend only one.



*(Clockwise from upper left): tadpoles; a newly emerged juvenile; view of coloration and pattern; the underside showing spots on the chest and tubercles on the feet; the stripe on the backside; a "settled-in" adult.*

# Bullfrog

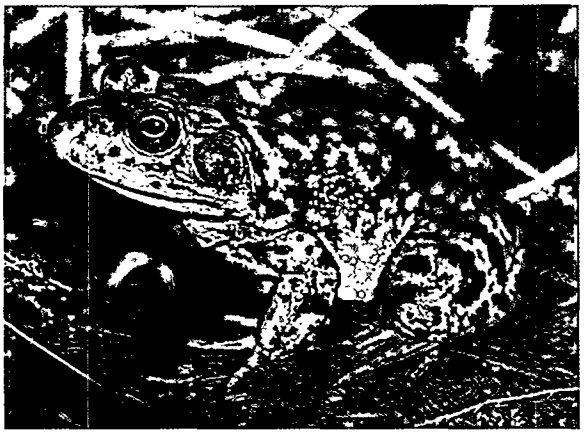
| | |
|---|---|
| Family: | Ranidae |
| Common Name: | True frogs |
| Species: | *Rana catesbeiana* |
| Common Name: | Bullfrog |

Today, the bullfrog is one of the most widely distributed amphibians in North America, ranging north to south from Nova Scotia to central Florida and west to the Rocky Mountains with isolated populations as far west as California and British Columbia. The historic western extent of this range cannot be determined since this species was widely introduced by humans. In fact, there is some question whether the bullfrog is native to New Mexico or was introduced. In New Mexico, the bullfrog can be found statewide at elevations up to 2100 m (6930 ft) where freshwater is found.

The bullfrog is easily identified by long powerful legs and a short glandular fold that curves around the eardrum. On males, the eardrum is about twice the size of an eye; whereas, on females, the sizes are similar. Body color is green or brown above–usually with spotting–and cream or yellow underneath. Males have a vocal pouch, and the throat is yellow. Large adults may be as long as 20 cm (8 in.).

This frog can be found along the freshwater habitats of the Rio Grande and associated tributaries–usually in quiet water with thick aquatic vegetation. When disturbed, they will escape to deeper water by long, splashing leaps. Their appetite is voracious. They will sit and wait for salamanders, snakes, birds, bats, and small rodents.

In some areas this species is likely responsible for the decline of endemic populations of wetlands herpetofauna. Even so, this species is protected in New Mexico by a required fishing license and a limited hunting season.



# Canyon Treefrog

| | |
|---|---|
| Family: | Hylidae |
| Common Name: | Treefrogs |
| Scientific Name: | *Hyla arenicolor* |
| Common Name: | Canyon Treefrog |

These long-legged frogs are powerful jumpers. In the Southwestern US, the canyon treefrog can be found at elevations from near sea level to around 2990 m (9800 ft) from southern Utah to central Colorado and south into Mexico.

The body of this treefrog is well camouflaged, depending on the natural surroundings. Against black basalt this frog is grayish in color. Against tuff, this animal will be brown to tan. The plump body is toadlike with warty skin. The toe tips have adhesive discs that allow the animal to climb on anything. They breed in streams, in potholes in solid rock, and in rain pools on rock cliffs.

In the spring of the year, White Rock Canyon echoes with the call of the canyon treefrog. Where Pajarito Canyon drops precipitously into White Rock Canyon, we collected the canyon treefrog in the rock base pool that is worn into the rock where water drops 100 m (330 ft) into White Rock Canyon. The treefrog's loud call—"ba-a-a"— bounces off the canyon walls. Looking closely into the cracks of the rocks, one may see a small frog staring out. We have also found treefrogs clinging to rocks in the burned area of the La Mesa fire where no ponds or water sources were close by.

*(Clockwise from upper left): note the toepads; close-up of toepad; front face view; note the camouflage; adult canyon treefrog clinging to rock; adult.*

## Western Chorus Frog

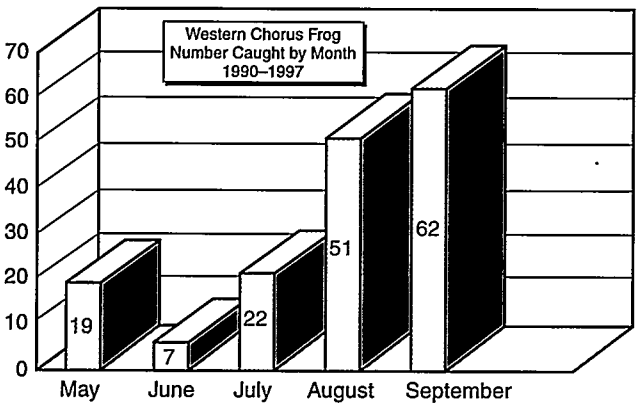
| | |
|---|---|
| Family: | Hylidae |
| Common Name: | Treefrogs |
| Scientific Name: | *Pseudacris triseriata* |
| Common Name: | Western Chorus Frog |

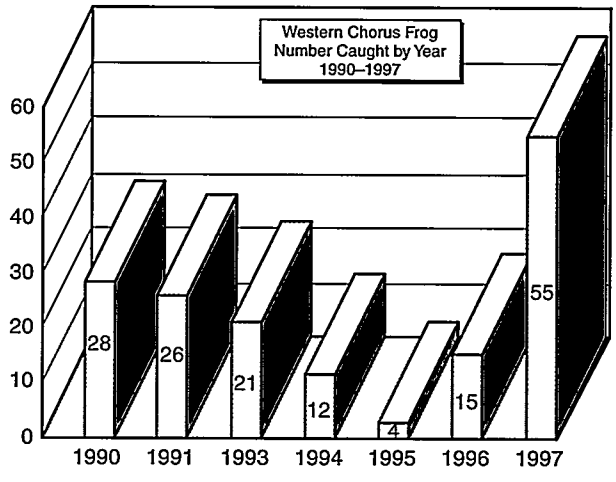
This species maintains populations from as far east as the north Atlantic coast, west to Idaho and British Columbia, and south to isolated pockets in central Arizona and northern New Mexico. In New Mexico the distribution trends southward, following the Rio Grande drainage at elevations ranging from 1280 to 3050 m (4224 to 10,065 ft).

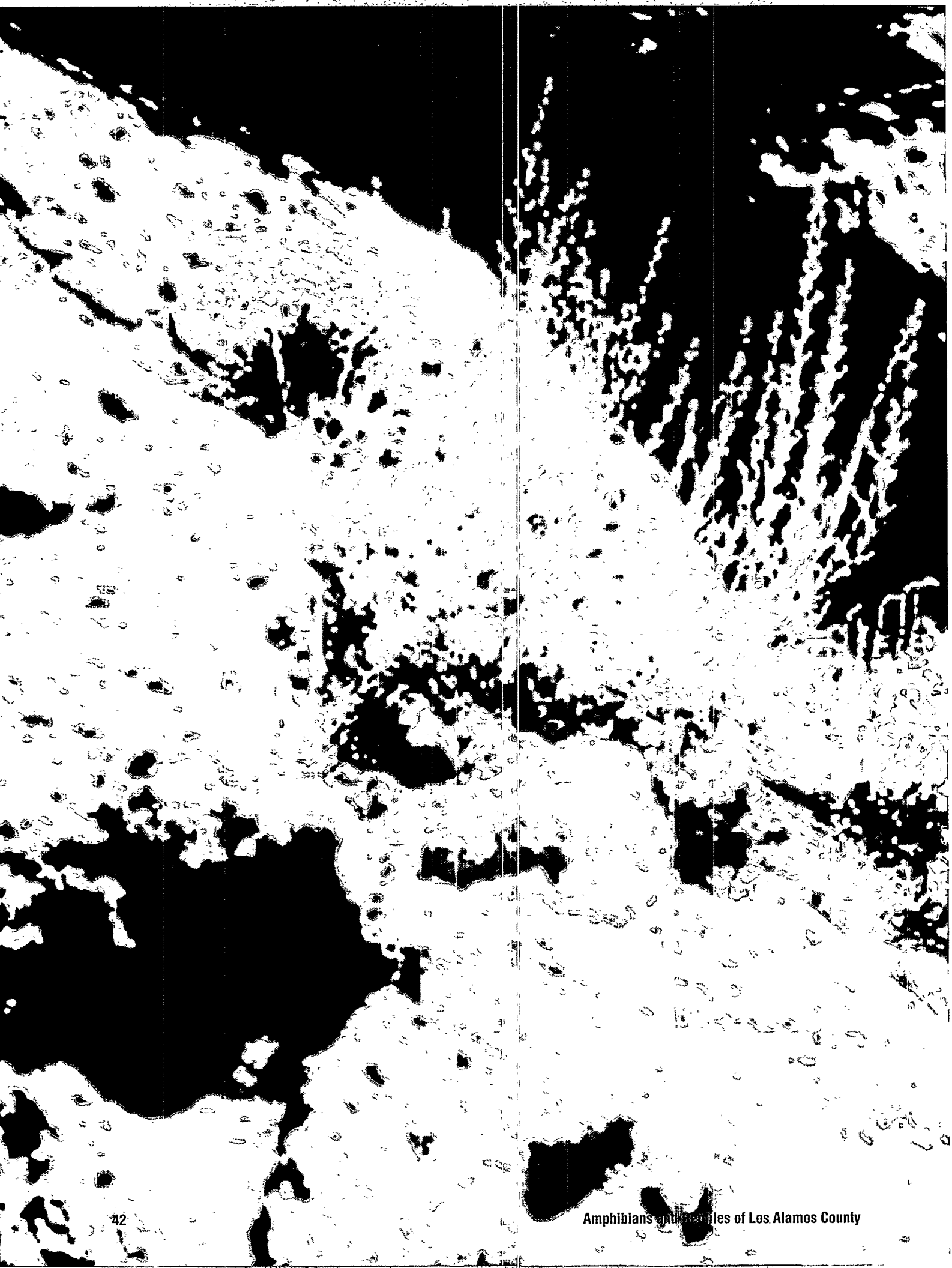
This small, brown, olive green, or grayish frog (19 to 39 mm [.75 to 1.6 in.]) has a very loud call. Early in the spring the ponds and slow-moving water will vibrate with the call of the western chorus frog. The regularly repeated "crrreeek" or "prrreeep" is often described as a sound made by running a fingernail over the small teeth of a pocket comb. The adults have a dark stripe that extends through the nostril, through the eye, and above the forelimb to the groin. There is usually a triangular spot on the forehead, and the hind foot has reduced webbing and no toe pads. The back is spotted, and the throat is heavily mottled. Males are slightly smaller than females.

This is one of the earliest breeding frogs in New Mexico. We have heard them calling as early as April, the males calling from atop floating vegetation night and day. In the higher elevations, calls can be heard even before all of the surface ice of the water has melted. They breed in shallow or temporary bodies of water, grassy meadows, and rock pools.

*(Clockwise from left): Note the dark stripe from nostril to groin; tadpole; tadpole tail being absorbed; immature on fingertip; immature blended into rock.*


Western Chorus Frog
Number Caught by Month
1990–1997
70
60
50
40
30
20
10
0
19
7
22
51
62
May
June
July
August
September


Western Chorus Frog
Number Caught by Year
1990–1997
60
50
40
30
20
10
0
28
26
21
12
4
15
55
1990
1991
1993
1994
1995
1996
1997



## F
### Le

There is only one representative of the collared lizard family in Los Alamos County, the collared lizard. These lizards are large, alert lizards that are active during the day. They have well-developed legs and long tails.

- Collared lizard (*Crotaphytus collaris)*

The lizards in this family are slender, long-tailed or squat-bodied, and spine covered. They are diurnal and some members can be arboreal. Most species lay eggs but some give birth to live young.

- Short-horned lizard *(Phrynosoma douglasii)*
- Prairie lizard *(Sceloporus undulatus)*
- Tree lizard *(Urosaurus ornatus)*
- Side-blotched lizard *(Uta stansburiana)*
- Lesser earless lizard *(Holbrookia maculata)*

The whiptails are diurnal, alert predators. Some members of this family are parthenogenetic, that is, all individuals are female. The offspring are identical to the mother, generation after generation.

- Chihuahuan spotted whiptail (*Cnemidophorus exsanguis*)
- Checkered whiptail (*Cnemidophorus grahamii*)
- New Mexico whiptail (*Cnemidophorus neomexicanus*)
- Plateau striped whiptail (*Cnemidophorus velox*)
- Little striped whiptail (*Cnemidophorus inornatus*)

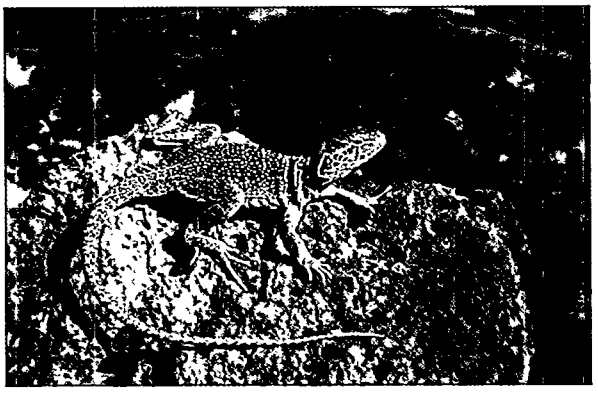
### Skink

Skinks are fossorial a[illegible]ing the day in secretive habitats. Some spec[illegible]ive birth to live young.

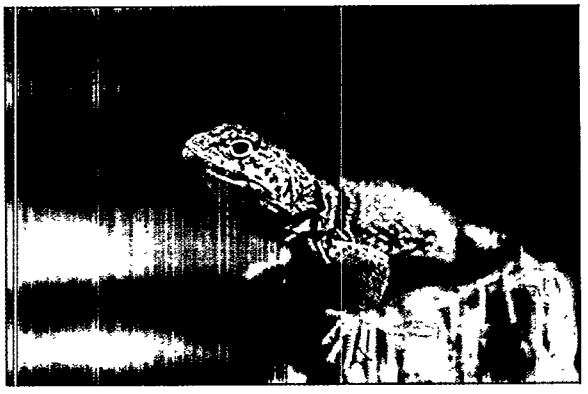
- Many-lined skink (*Eumeces multivirgatus*)
- Great Plains skink (*Eumeces obsoletus*)

# Collared Lizard

Family Name: Crotaphytidae
Common Name: Collared and Leopard Lizard
Scientific Name: *Crotaphytus collaris*
Common Name: Collared Lizard



*Note the long tail.*



*Note the black collar.*

*Note the broad head and short snout.*

The complete range of the five subspecies of collared lizard is fairly extensive within the greater portion of the American Southwest. The northeastern edge extends west from southwest Illinois all the way to eastern Utah and extends south through central Texas and all of New Mexico and Arizona to central Mexico. In New Mexico, collared lizards are found at elevations from 900 to 2750 m (2970 to 9075 ft). They can be seen—sunning on basalt rocks or tuff cliffs—in White Rock Canyon and all along the southern edge of the Pajarito Plateau from late April or early May after hibernation.

This large, robust lizard has a broad head, short snout, and long tail. The males—larger in size—have different markings than the females. The back, sides, and limbs of the male are greenish, while the female has a slight greenish tinge. The throat of the male is dark-spotted—green to bluish—while the throat of the female is unmarked or lightly spotted. In breeding season the female gains color with spots and bars of red or orange on the sides of the neck.

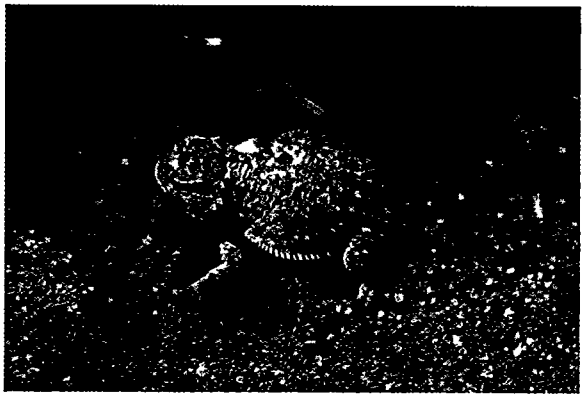
These large, robust lizards like boulder-strewn or talus slopes where the vegetation is sparse, providing good lookouts for prey—primarily grasshoppers but also other lizards, berries, leaves, and flowers. When startled or pursuing prey, they can move nimbly and rapidly by jumping from rock to rock. At times they will run with forelegs lifted off the ground and tail raised. (Unlike other lizards, the collared lizard does not readily lose its tail, which is used for balance.)

This lizard is common until August. As temperatures cool, they return to hibernation. The males are highly territorial and will aggressively keep other males from their territory. Although females are less territorial, they tend to occupy specific home ranges.

# Short-horned Lizard

| | |
|---|---|
| Family Name: | Phrynosomatidae |
| Common Name: | Earless, Spiny, Tree, Side-blotched, and Horned Lizards |
| Scientific Name: | *Phrynosoma douglasii* |
| Common Name: | Short-horned Lizard |

The complete range of the short-horned lizard roughly coincides with the Rocky Mountain Range, extending to both sides of this range from southernmost Canada south to central Mexico. In New Mexico, the short-horned lizard occupies the western two-thirds and is chiefly a mountain dweller in the more arid and southern portions of its particular range. An occasional specimen was captured in the pit-fall traps in the Pajarito wetlands during the past six years. They have been noted during field surveys in the piñon-juniper woodlands and the ponderosa pine forests of the Pajarito Plateau and in gardens of White Rock.

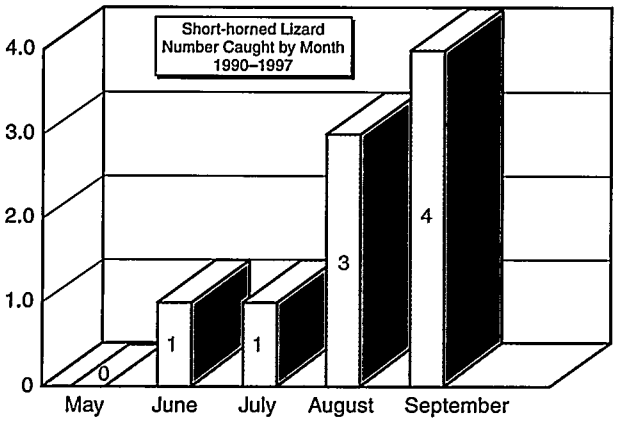


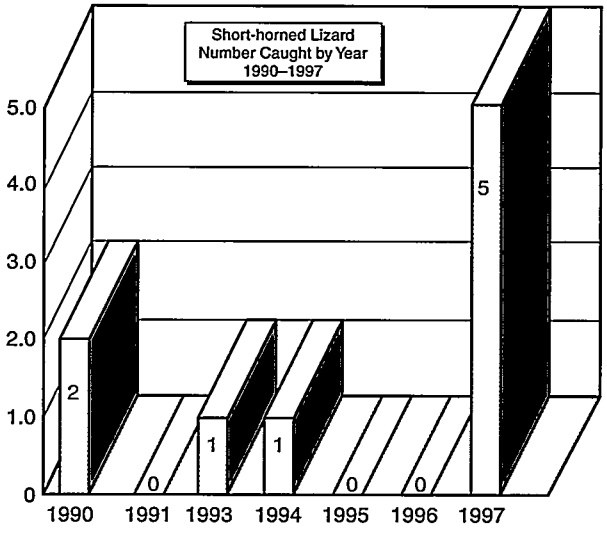
*Note how well this lizard matches with background colors.*

The most striking aspect of this lizard is an oval body and daggerlike head spines. One can hardly resist picking up this waddling lizard (sometimes called a "horny toad") as it scurries across the forest or woodland floor. These solitary lizards are often hard to see because they flatten against the ground. Their coloration—dull yellow, brown, or gray—and spiny skin blend them into the surrounding landscape. The rear throat and chest are usually buff or orange-yellow.

This lizard bears live young and has a litter size varying from 9 to 30, depending on the size of the female. The young are able to fend for themselves within an hour of birth—the mother provides no parental care.

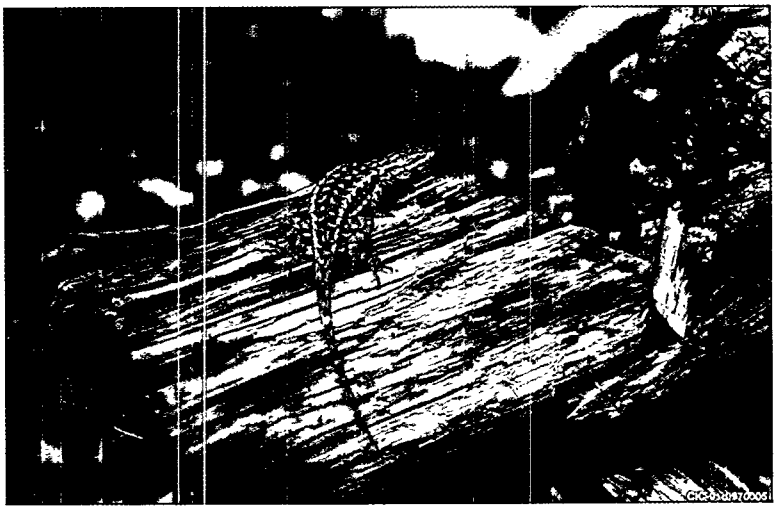
The short-horned lizard is sometimes a favorite pet of children. However, the lizard does not do well in captivity because it does not receive the large numbers of ants needed to survive.



# Prairie Lizard

| | |
|---|---|
| Family Name: | Phrynosomatidae |
| Common Name: | Earless, Spiny, Tree, Side-blotched, and Horned Lizards |
| Scientific Name: | *Sceloporus undulatus* |
| Common Name: | Prairie Lizard |



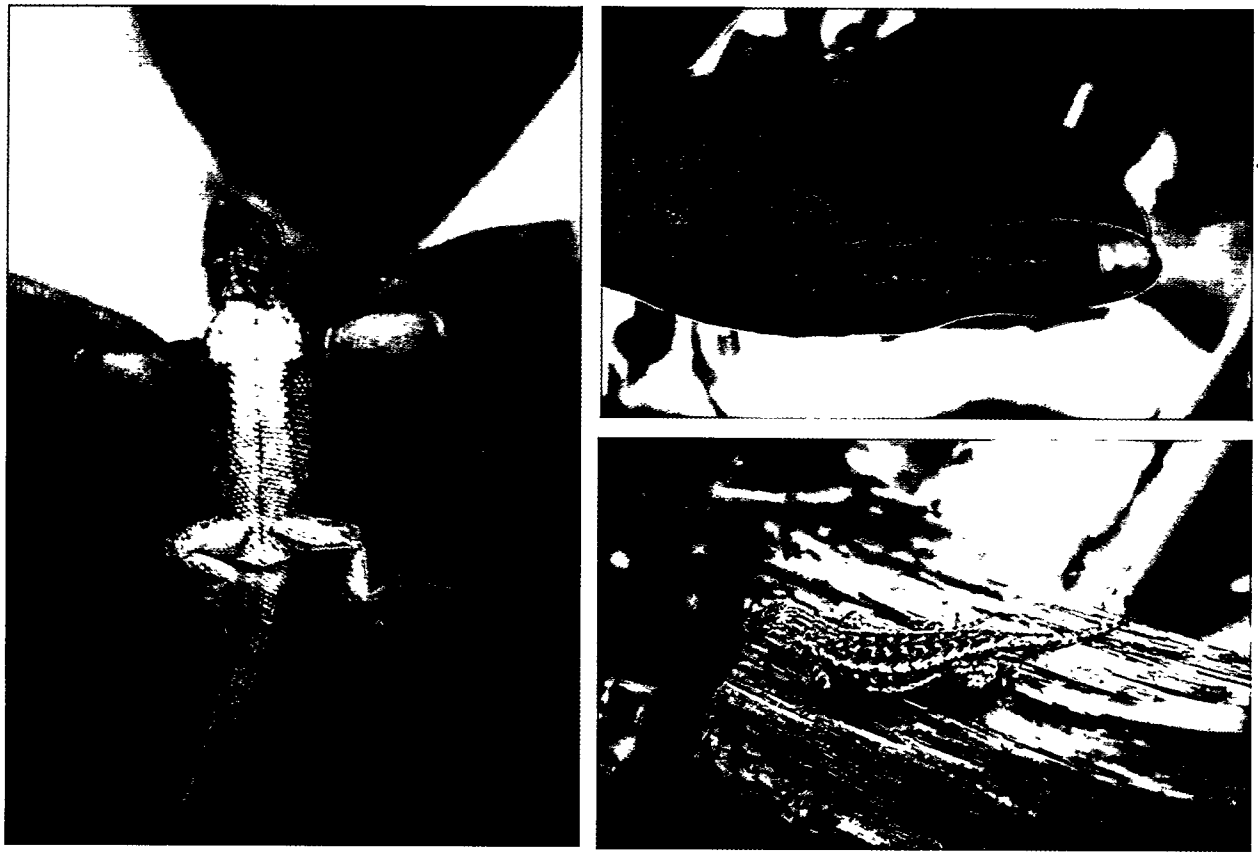
*Adult prairie lizard.*

This species, sometimes called "swifts" or "blue bellies," is one of the most widely distributed lizards in the US. It can be found throughout the area and is one of the most adaptable species in New Mexico. On the Pajarito Plateau, the species occupies a wide range of habitats. Bogert (1979) found the species from 1640 m (5412 ft) at the Rio Grande to near 2500 m (8250 ft) in ponderosa pine forests. The prairie lizard was the most common lizard collected in the pit-fall traps in the Pajarito wetlands.

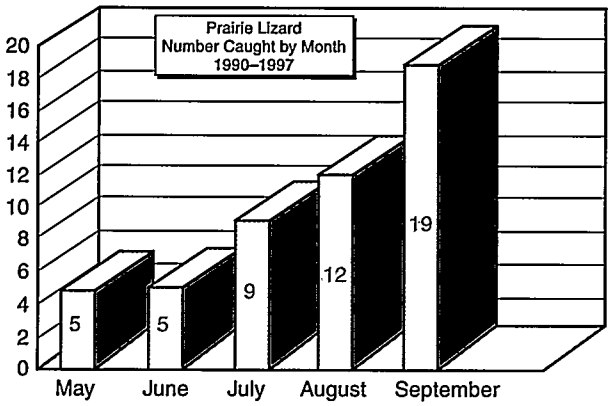
The main body color of various populations may closely match the dominant ground color–gray, brown, or reddish. There are light stripes along either side of the back that extend from behind each eye onto the tail. The throat of a male usually possesses a pair of blue spots, one on each side. Males also have bright blue belly patches edged with black between the limbs. These colors may also be present in females. Females can lay clutches of 4 to 17 eggs, and hatchlings can be seen around mid-June to September. We have observed these lizards displaying territorial behaviors. If one lizard enters another's territory, the owner will chase the other off or fight. The owner will also do "push-ups" to show the intruder that they have entered into occupied territory.

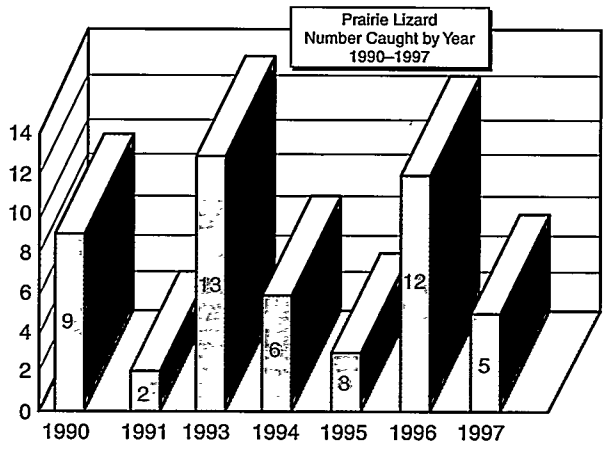
These lizards are seldom active at temperatures much below 32°C, and they can tolerate levels a few degrees above 38°C for only relatively brief periods. They bask on the ground, but often find elevated sites on rocks, logs, stumps, posts, tree trunks, or cliffs. They also thrive around human-made structures such as stables, sheds, houses, woodpiles, and rubbish heaps, all of which tend to attract insects that comprise the major part of their diet. Wherever loggers have cut ponderosa pine decades earlier, decaying logs provide shelter in crevices and under bark.

Prairie lizards are sit-and-wait predators that prey mainly on spiders and other small arthropods. Bogert says, "Casual observations would suggest that, from suitably elevated basking sites, these lizards can scan most of the terrain within a radius of two meters. The distance at which they detect the presence of their prospective prey would depend in part on its size, or other peculiarities, but ordinarily only moving arthropods attract the reptile's attention. Dead or immobilized creatures of suitable size go unnoticed."



*(Clockwise from left): note blue throat and belly patches; hatchling prairie lizard; note the light stripe down each side of the back.*



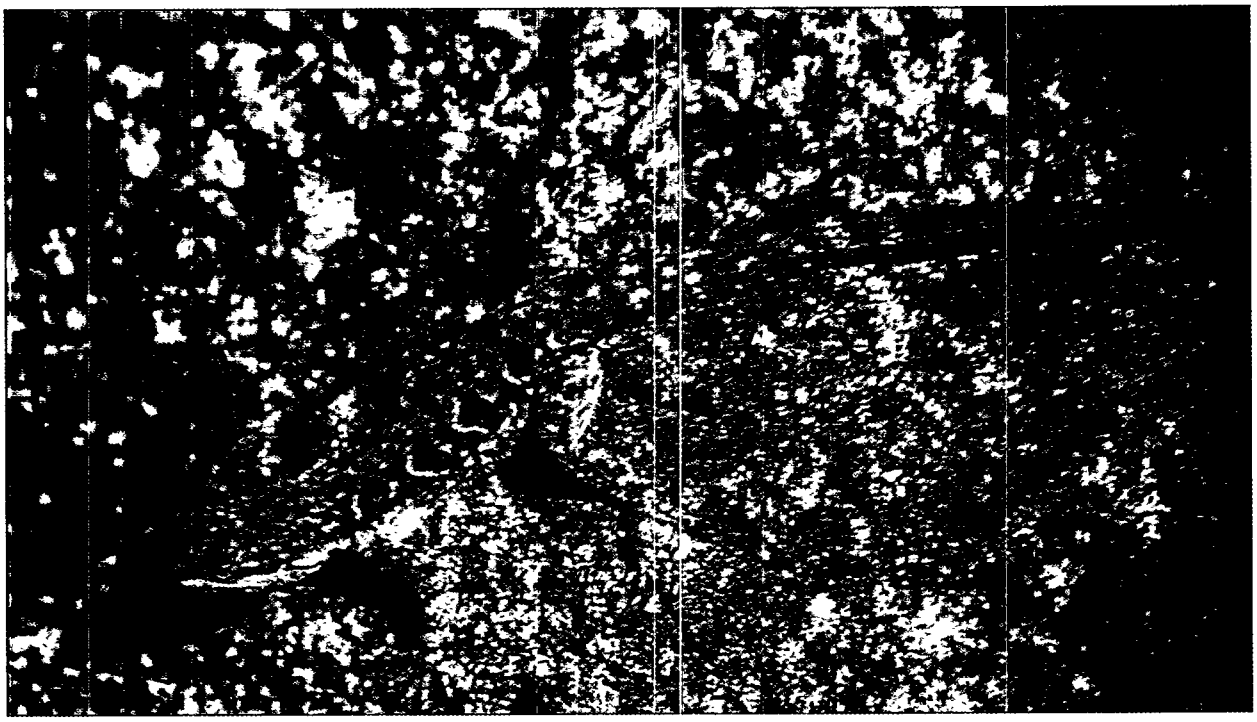
# Tree Lizard

| | |
|---|---|
| Family: | Phrynosomatidae |
| Common Name: | Earless, Spiny, Tree, Side-blotched, and Horned Lizards |
| Scientific Name: | *Urosaurus ornatus* |
| Common Name: | Tree Lizard |

The distribution of the tree lizard in the US begins in the north from the southern extent of Wyoming south through western Colorado, east-central Utah, west-central New Mexico, all of Arizona, and deep into Mexico along the Pacific Ocean. In New Mexico this species can be found west of the Rio Grande and on many of the mountain ranges along the eastern margin of the Rio Grande drainage basin. Degenhardt (1975) considered this species to be one of the three most widely distributed and abundant lizards in Bandelier National Monument. Bogert (1979) found the lizard to be uncommon within Laboratory boundaries—being on the periphery of its range at this altitude. He found it restricted to canyons or rocky terrain with sparse vegetation and collected specimens near the Rio Grande in Ancho Canyon at the 1640-m (5412-ft) elevation. He also saw tree lizards at Tsankawi Ruins where they inhabited the rocks below the cliffs in the piñon-juniper woodland at 1950 m (6435 ft). We have not found any of this species during our surveys in the Pajarito wetlands.

The coloration and pattern varies from population to population, possibly influenced by the color of the soil. Possible colors include dark brown or black—when the lizard is in its dark phase—tan, sooty, or gray. The scales on the back have two bands of large scales that are separated by a strip of smaller scales. The male will have blue or blue-green belly patches, which may be connected by a blue throat patch. The female will have whitish, orange, or yellow coloration on the throat and no belly patches.

Though the vernacular name would indicate that the animal inhabits trees, they are mostly found on cliffs and rocks in the Jemez Mountains. Often found in pairs or groups, this lizard is masterful at hiding by keeping a tree trunk or branch between itself and a potential enemy. This species can be more readily seen in the morning or late afternoon, foraging for a wide variety of arthropods.



*Note how the pattern on the back of the lizard resembles tree bark.*

# Side-blotched Lizard

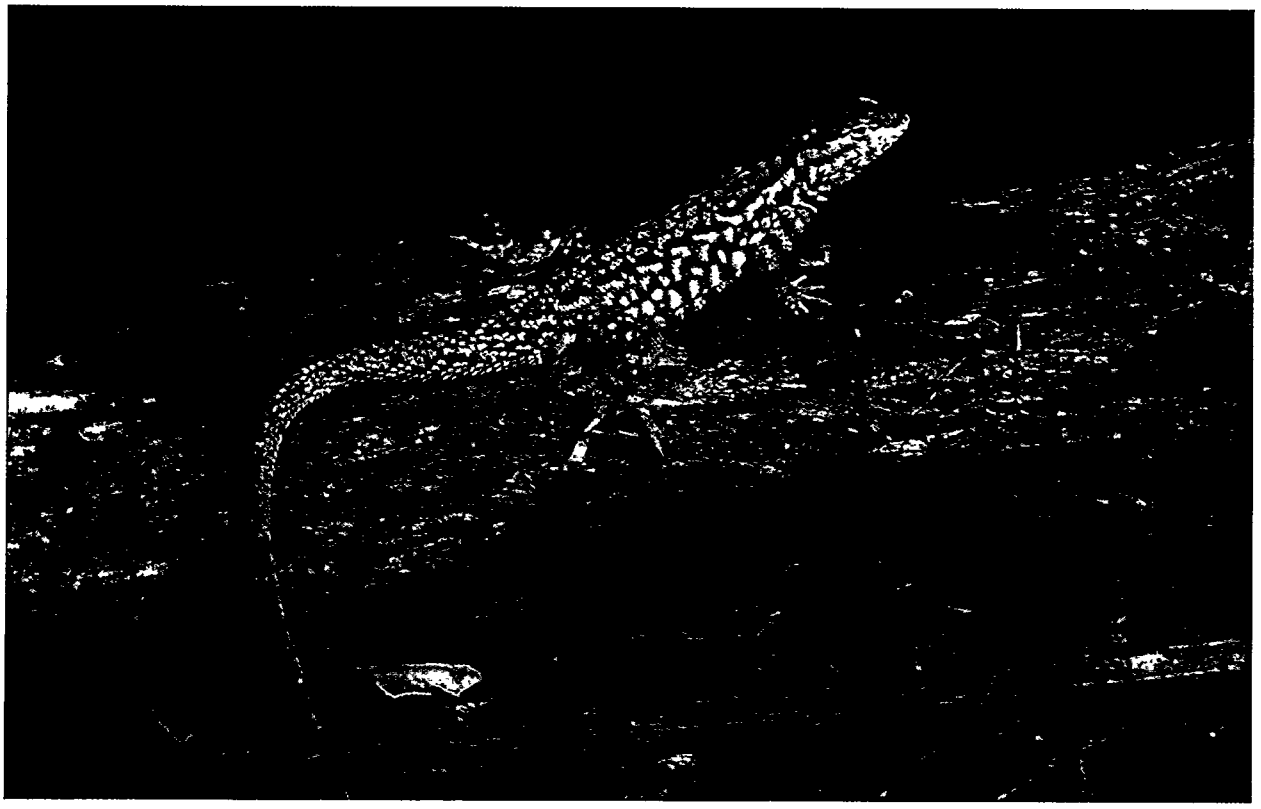
| | |
|---|---|
| Family Name: | Phrynosomatidae |
| Common Name: | Earless, Spiny, Tree, Side-blotched, and Horned Lizards |
| Scientific Name: | *Uta stansburiana* |
| Common Name: | Side-blotched Lizard |

This lizard has a widespread distribution throughout the western US and New Mexico but has not been found in Los Alamos County. However, it might be found in the County near the Rio Grande and has been reported from Santa Fe and Rio Arriba counties. They can be found in areas with sand, rock, grass, shrubs, and scattered trees.

The side-blotched lizard is relatively small, with a body length 3.7 to 5.9 cm (1.5 to 2.4 in.). The tail is often longer than the body. Its coloration varies from brownish to gray to yellowish with a dark blotch behind each forelimb. The upper surface of the body can be marked with large or small spots or without a pattern. Juveniles have a white stripe on each side of the body beginning just below the nasal openings and extending back through the eye, over the shoulder, and onto the tail.

Mature females can lay as many as 3 clutches annually with 2 to 5 eggs in each clutch. The length of the breeding season will vary geographically, being longer and producing larger clutch sizes further south.

This species is generally a ground dweller, mainly found along sandy washes that have scattered rocks and bushes growing low to the ground. It is an insectivore that will "sit and wait" for insects, scorpions, spiders, mites, and ticks.



*Note that the side blotch is sometimes present or absent.*

# Lesser Earless Lizard

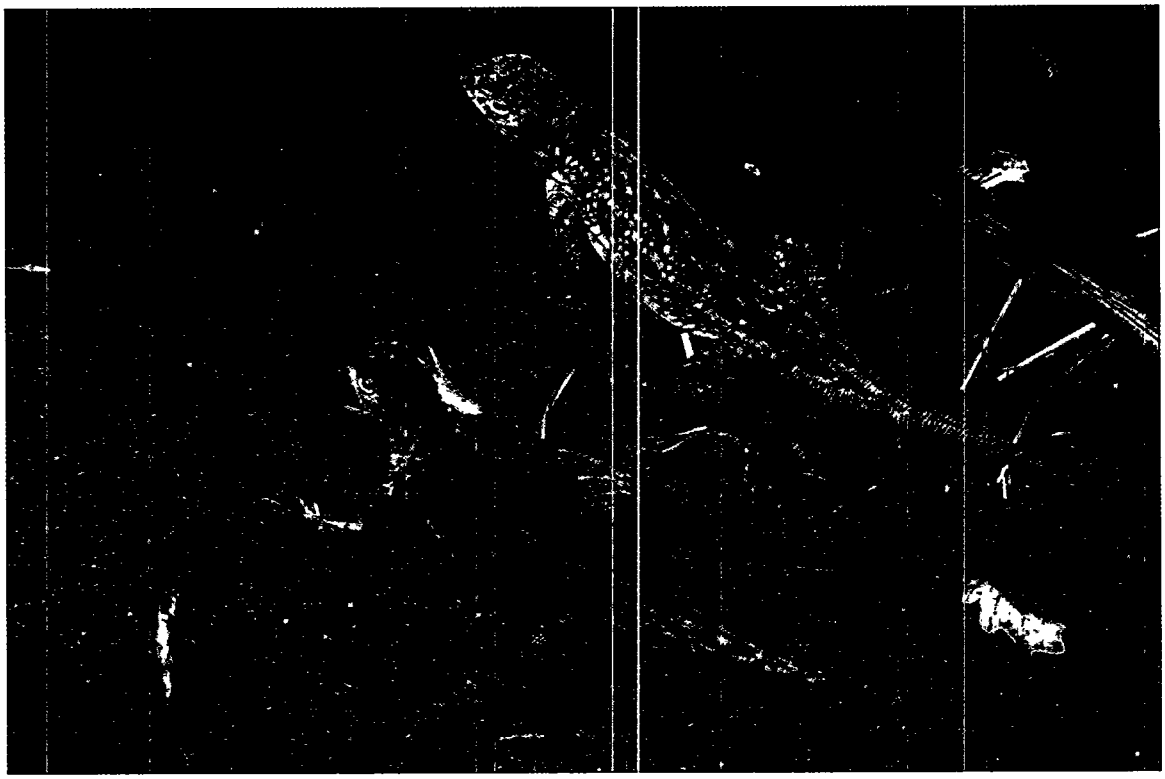
| | |
|---|---|
| Family Name: | Phrynosomatidae |
| Common Name: | Earless, Spiny, Tree, Side-blotched, and Horned Lizards |
| Scientific Name: | *Holbrookia maculata* |
| Common Name: | Lesser Earless Lizard |

This lizard has a widespread distribution throughout the western US from southern South Dakota south through the Great Plains to central Texas and west through New Mexico and Arizona into Mexico. It has not been found in Los Alamos County but has been reported from Santa Fe and Rio Arriba counties.

The color of this ground-dwelling lizard—brown, tan, or gray—matches the soil where this species lives. Considered as moderate in size, the lesser earless lizard averages only 10 to 13 cm (4 to 5 in.) in length but seems larger because of a broad head and stout body with short legs. The back is marked with scattered dark patches, with the back of each patch edged with a lighter color. There is a pair of black spots on each side of the belly with a light-bordered dark stripe on the thighs. When gravid, the females develop an orange-pink to bright crimson coloration that permeates the dorsal color.

This lizard is a fast runner and cannot be easily caught by hand. It is best adapted to living on or beneath the surface of sandy or loose soils where it burrows headfirst for protection. The females may lay up to six eggs from April to September, depending on geographic location. The hatchlings emerge a month after the eggs are laid and grow slowly throughout the first year.

These animals eat grasshoppers, butterflies, moths, spiders, and various other insects. They often forage out in the open away from vegetation and other natural hiding places because they can quickly burrow into the ground when danger threatens.

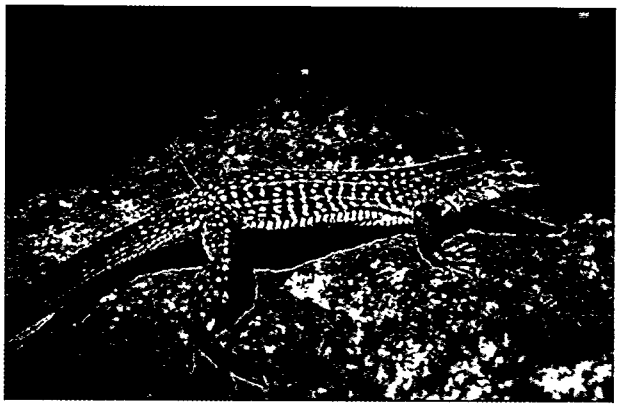


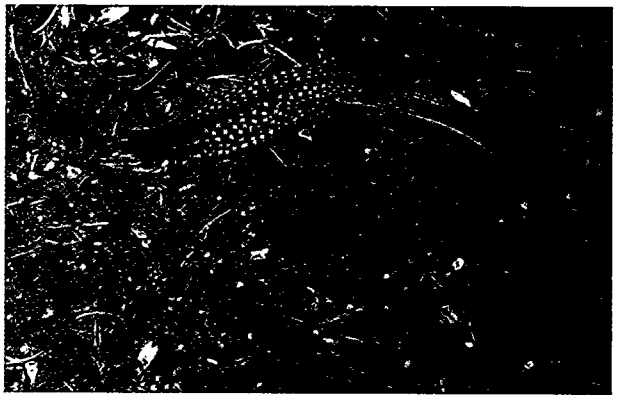
*Note the crimson permeation of the female.*

# Chihuahuan Spotted Whiptail

| | |
|---|---|
| Family Name: | Teiidae |
| Common Name: | Whiptails |
| Scientific Name: | *Cnemidophorus exsanguis* |
| Common Name: | Chihuahuan Spotted Whiptail |

The range of the Chihuahuan spotted whiptail stretches from north-central New Mexico south to central Mexico at elevations between 760 and 2440 m (2500 to 8000 ft). Bogert found this species near the mouth of Ancho Canyon at an elevation of 1650 m (5445 ft). Degenhardt (1975) reported that this species has the widest distribution of any whiptail in Bandelier National Monument. He obtained specimens between elevations of 1615 and 1830 m (5330 and 6039 ft), mainly in grassy, semi-open areas of several canyons including White Rock Canyon. However, this lizard may not range farther north than the mouth of Los Alamos Canyon.





Body length of the Chihuahuan spotted whiptail is 2.5 to 10 cm (1 to 4 in.). The upper body is brown or reddish brown with cream to pale yellow stripes, spots, or both. The tail is bluish or greenish. All are female with an average life span of four years.

This species lays a clutch of 1 to 6 eggs; larger females produce more eggs. The eggs are elliptical, parchment-shelled, and cream-colored, averaging about 10 by 18 mm (0.4 by 0.75 in.) in size.

This species forages for food by digging under objects to find insects, spiders, and scorpions.

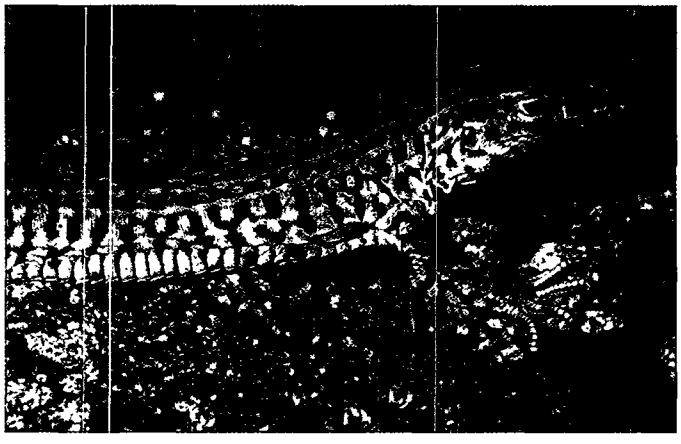
# Checkered Whiptail

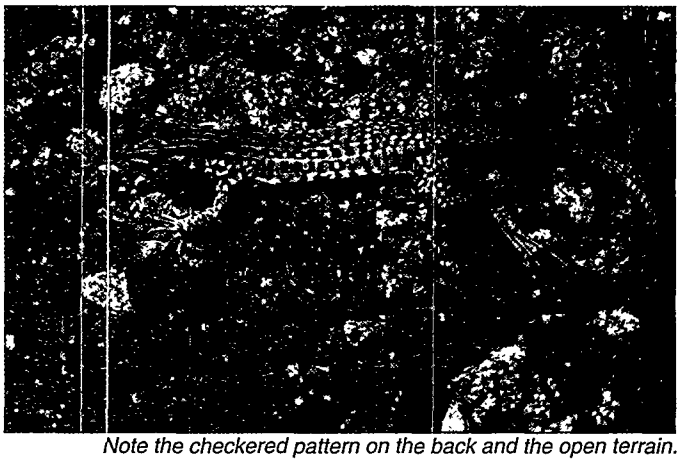
| | |
|---|---|
| Family Name: | Teiidae |
| Common Name: | Whiptails |
| Scientific Name: | *Cnemidophorus grahamii* |
| Common Name: | Checkered Whiptail |

The distribution of this species begins in the north in southernmost Colorado and extends south through central New Mexico into southwestern Texas and slightly into Mexico. It is commonly found in those habitats in the Rio Grande drainage that are continuously disturbed by flooding and by humans at elevations from 270 to 2100 m (900 to 6900 ft). This whiptail has not been reported for Los Alamos County but has been found in Rio Arriba and Santa Fe counties.

The body length of this whiptail is 28 to 40 cm (11 to 16 in.). The distinguishing characteristic of this lizard is a dark checkered pattern on a yellowish to cream colored upper body. There are six pale stripes along the body plus a stripe down the center. The underside of the body is whitish and not marked. The throat and chest may have a few black spots. The tail is brown to yellowish.

This species seems to prefer those areas that are relatively open where the soil can be hard packed or sandy but conducive to running. It will forage for long periods in places that it can dig in the soil or root through debris to find insects, such as butterflies, grasshoppers, spiders, and centipedes.





*Note the checkered pattern on the back and the open terrain.*

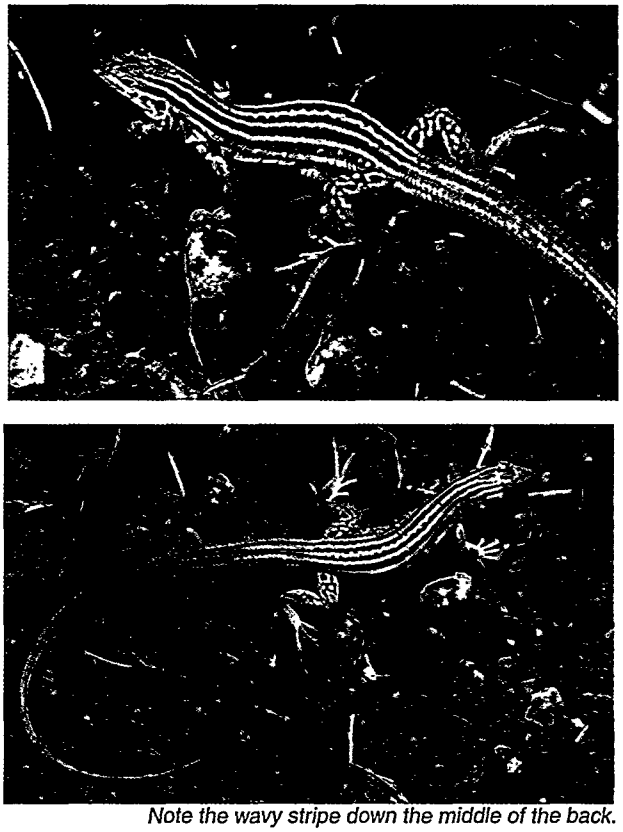
# New Mexico Whiptail

| | |
|---|---|
| Family Name: | Teiidae |
| Common Name: | Whiptails |
| Scientific Name: | *Cnemidophorus neomexicanus* |
| Common Name: | New Mexico Whiptail |

The New Mexico whiptail is found along the tributaries of the Rio Grande. It seems to prefer those areas that are flooded regularly and contain human evidence such as ditches, fences, and trash piles. This species was not captured at the Pajarito wetlands nor has it been found in Los Alamos County.

This species of whiptail is also all-female and has both stripes and spots. It is small and slender—the body length is 0.8 to 1.2 cm (2 to 3 in.). The seven stripes are a well-defined light color over a brown or black body. The single most identifying characteristic of this species is the stripe that goes down the middle of the back, which is wavy or zigzagged. The belly is a light blue, and the tail is greenish. (The tail of a juvenile is bright blue.)

The New Mexico whiptail lays a clutch of 1 to 4 eggs in the summer that hatch in 50 to 60 days. It likes to utilize human-disturbed areas to hide and to hunt for spiders and insects.

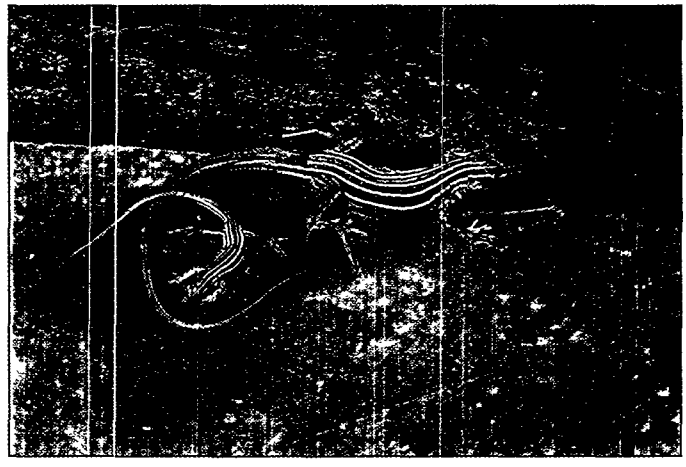


*Note the wavy stripe down the middle of the back.*

# Plateau Striped Whiptail

| | |
|---|---|
| Family Name: | Teiidae |
| Common Name: | Whiptails |
| Scientific Name: | *Cnemidophorus velox* |
| Common Name: | Plateau Striped Whiptail |

This is a wide-ranging whiptail—encompassing the four corners region of the American Southwest—and is generally restricted to the piñon-juniper woodland. This was the common whiptail found in the pit-fall traps of the Pajarito wetlands. Bogert (1974) also found the species in Guaje, Bayo, Pueblo, Los Alamos, Sandia, and Pajarito Canyons, and Cañada del Buey.

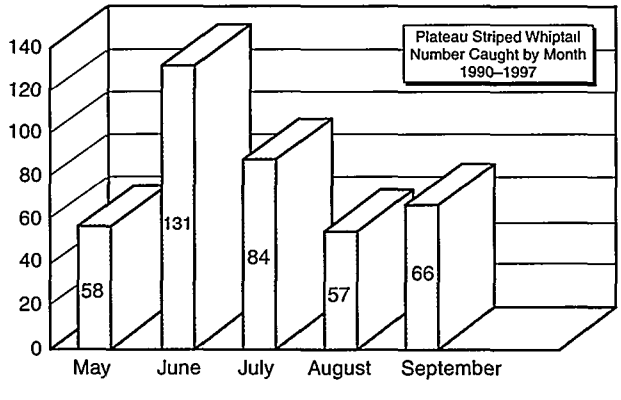


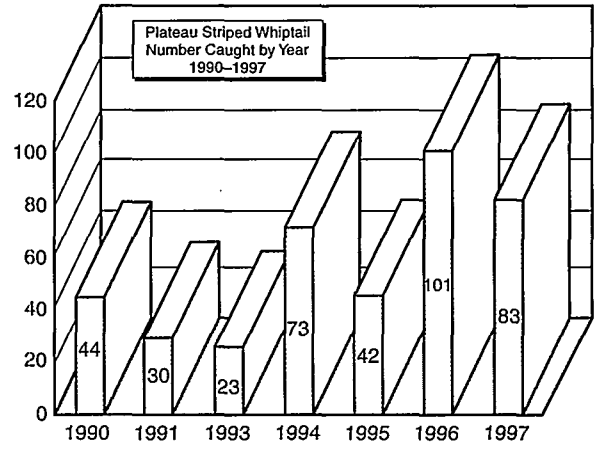
*Adult and juvenile; note the blue tail and the lack of spots in the dark fields between the light stripes of the adult.*

The plateau striped whiptail is an all-female species that ranges from 6.25 to 10 cm (2.5 to 4 in.) in length. Along the back are six distinct light-colored stripes running from head to tail with a possible, less distinct, stripe down the middle of the back. Between the stripes the body is blackish brown, and the end of the tail is light blue. (The whole tail of a juvenile is bright blue.) The belly of the adult is pale in color and is unmarked or tinged with blue.

Bogert (1979) found that the plateau striped whiptail was largely confined to the ecotone where piñon-juniper woodland merges with ponderosa pine forest in canyons ranging at elevations from 1900 to 2075 m (6270 to 6847 ft). They often seek cover under shrubs such as squawbush, Apache plume, or shrub-like clumps of Gambel oak, constantly moving in and out of the shade to maintain an optimum body temperature.

The whiptail lays a clutch of 3 to 5 eggs during June and July. The eggs hatch during the last half of August, and the hatchlings are 3 to 4 cm (1.2 to 1.6 in.) in body length. The primary diet of this species is insects, which are actively pursued by the whiptail—unlike lizards who utilize the 'sit-and-wait' method.

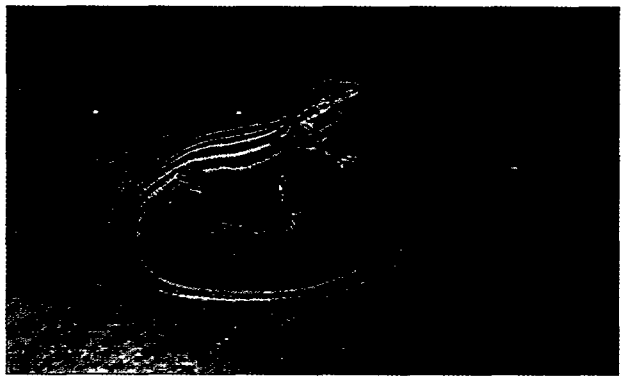


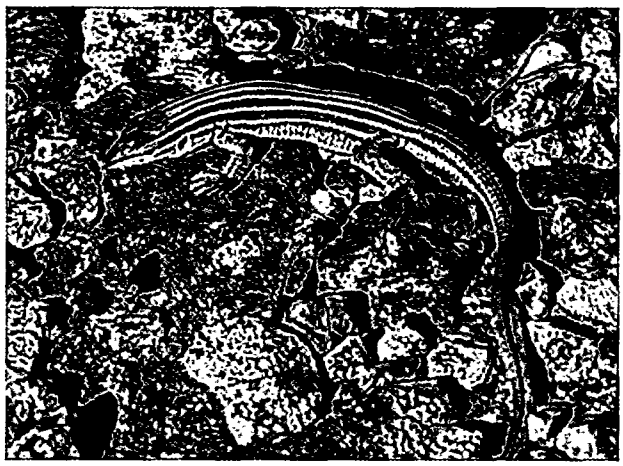
# Little Striped Whiptail

| | |
|---|---|
| Family: | Teiidae |
| Common Name: | Whiptails |
| Species: | *Cnemidophorus inornatus* |
| Common Name: | Little Striped Whiptail |

*Cnemidophorus inornatus* is widespread throughout the Chihuahuan Desert of the southwestern United States and Mexico with disjunct populations to the east, north, and south. The subspecies *C. i. juniperus* is disjunct, occupying mainly the San Juan Basin of northwest New Mexico and extending northward up the valleys of the Pecos River and the Rio Grande to the foothills of the Jemez and Sangre de Cristo mountains.



This species is one of the smaller whiptails. Body length is 5 to 7 cm (2 to 3 in.). Six to eight yellow or white stripes extend down the dark-colored back that becomes lighter with age. The tip of the tail is blue or purplish blue, and the underbelly is bluish white. The young are not as blue underneath. The little striped whiptail can be found within the pinon-juniper woodlands and open ponderosa pine forests where the ground is gravelly, sandy, or silty to elevations up to 2272 m (7498 ft). It will hibernate in narrow burrows, plugging the entrance with dirt. They will emerge in April with the juveniles and adult males most active early on. The diet consists mainly of insects, spiders, and centipedes.



# Many-Lined Skink

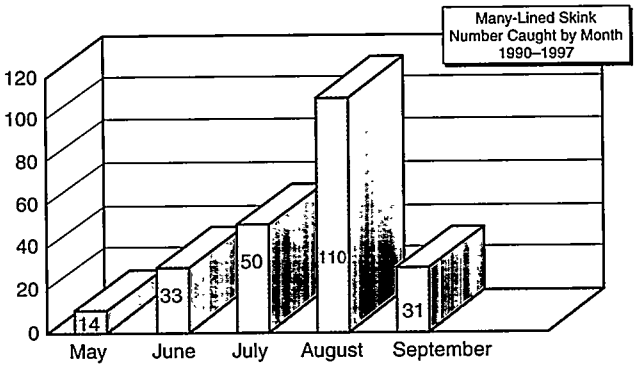
| | |
|---|---|
| Family Name: | Scincidae |
| Common Name: | Skinks |
| Scientific Name: | *Eumeces multivirgatus* |
| Common Name: | Many-Lined Skink |

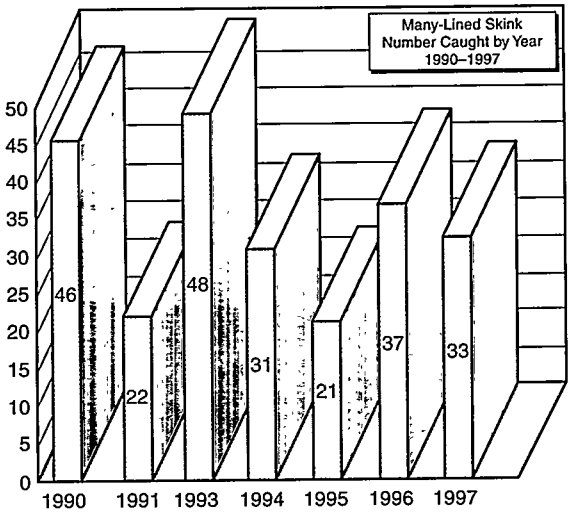
In the US, the many-lined skink is distributed southward from southern South Dakota through the southeastern corner of Wyoming, northwestern Nebraska, central Colorado, and most of New Mexico. In this area Bogert (1979) frequently found this skink by overturning logs and rocks. He found specimens in Bayo, Pueblo, Sandia, and Cedro Canyons and in Cañada del Buey. This was the most common skink found in the pit-fall traps in the Pajarito wetlands. Generally, this species is found in wet or damp areas along streams or enclosed basins.

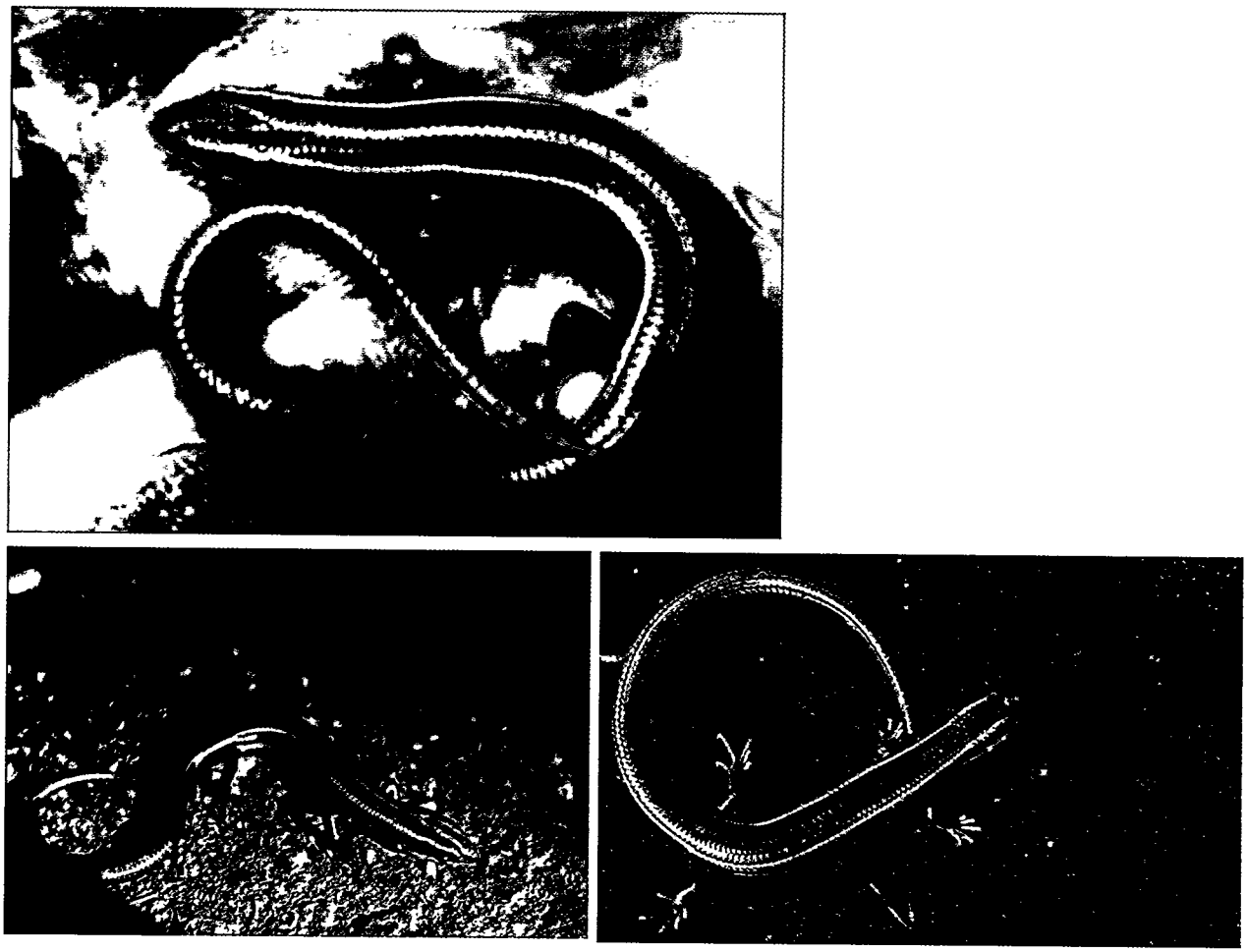
The many-lined skink ranges in size from 5.6 to 8.75 cm (2.25 to 3.5 in.). It is a slim, short-limbed, long-bodied skink with a very long tail. The body coloration can vary. Stripes can also vary in numbers and color, with some specimens not having stripes. Males may develop bright orange or red lips during the breeding season. The young have a bright blue tail.

Nests can be found beneath sunken rocks. The species will watch over their eggs and the very young, which range in number from 7 to 21.

These lizards eat insects, spiders, mollusks, and lizards.





*(Clockwise from upper left): note the bright blue tail of the juvenile; adult many-lined skink; immature.*

# Great Plains Skink

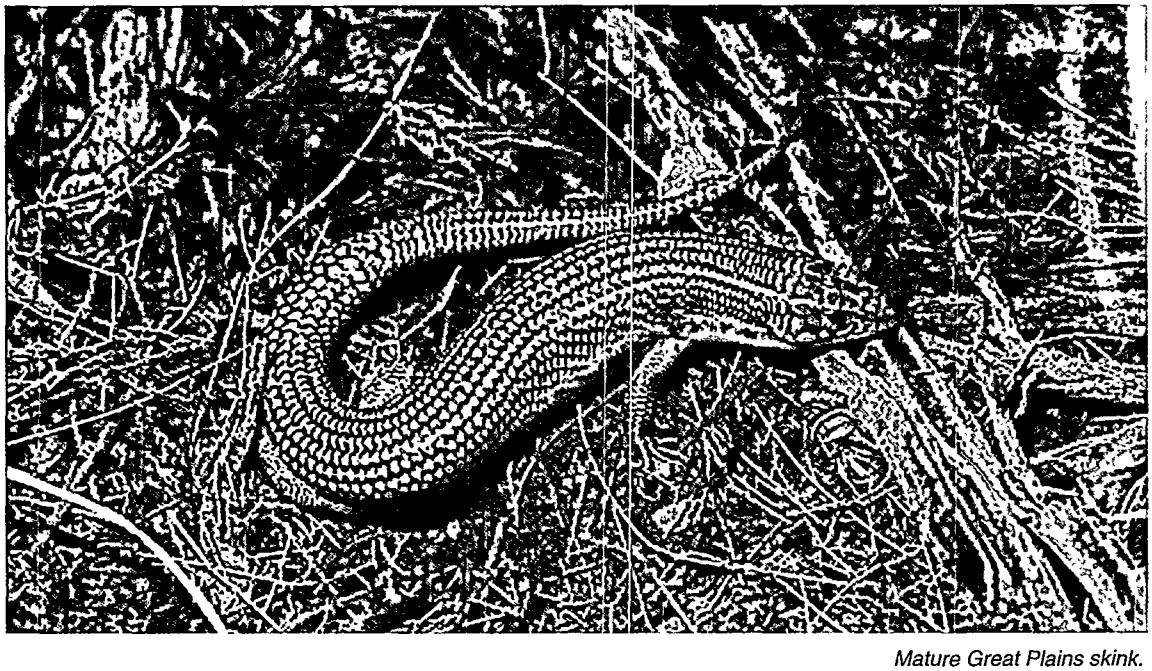
| | |
|---|---|
| Family: | Scincidae |
| Common Name: | Skinks |
| Scientific Name: | *Eumeces obsoletus* |
| Common Name: | Great Plains Skink |

In the US, the Great Plains skink is distributed throughout the southern Central Great Plains. In New Mexico, this species is usually found along major rivers and tributaries and in riparian areas with permanent or intermittent streams. Within the Pajarito wetlands, the Great Plains skink is less common than the many-lined skink (*E. multivirgatus*).

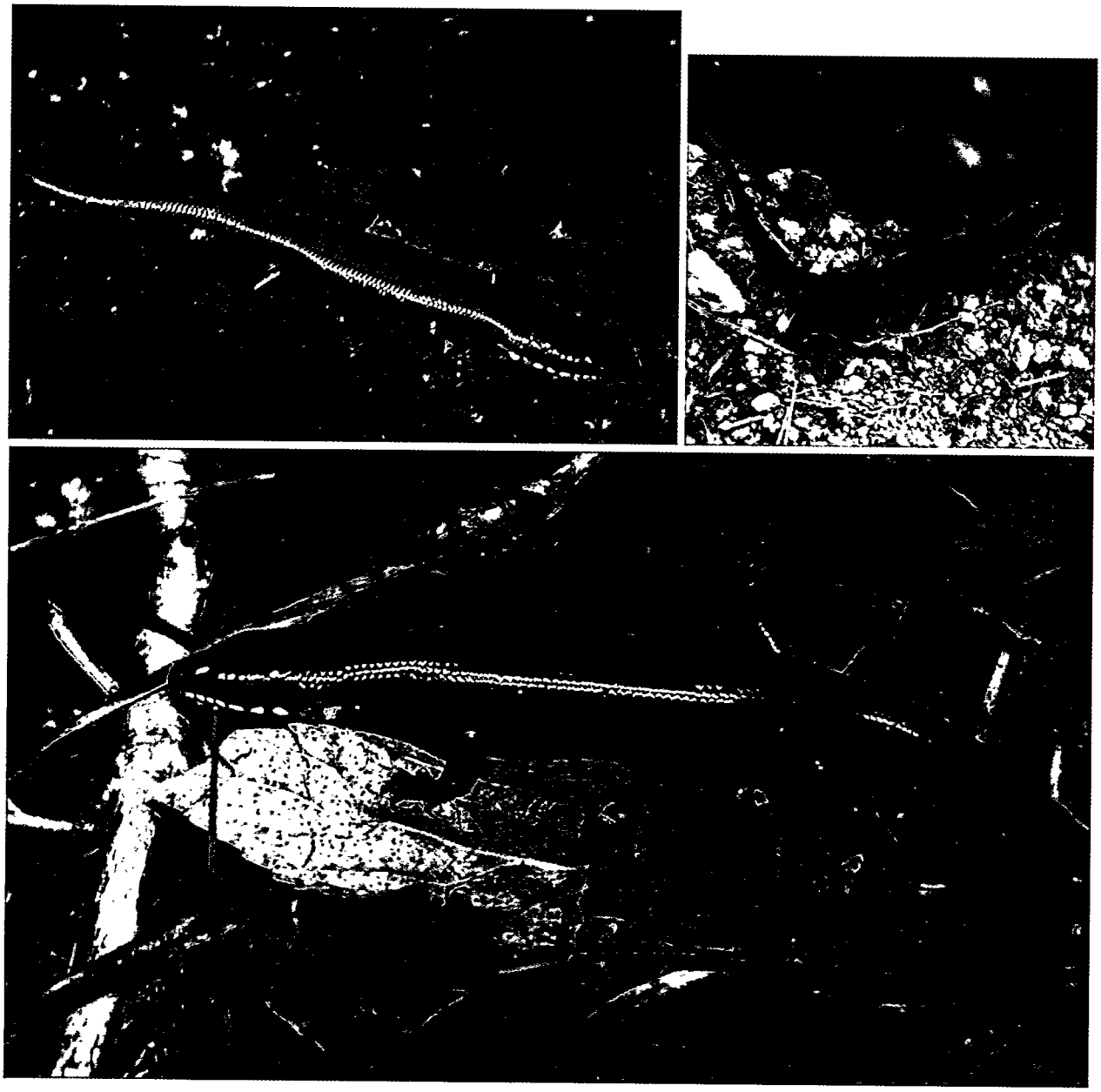
This is the largest skink in the area, measuring 8.75 to 15 cm (3.5 to 6 in.) long. It is light gray, olive-brown, or tan on top with many black or dark brown spots. The spots unite along the surface making scattered lines. The sides are usually flecked with salmon. The young are blue-black to jet black with a bright blue tail and orange and white spots on the head and along the sides.

This species is mostly found in wet to damp microclimates. It can be found in rodent burrows among leaf litter and organic debris. These lizards are secretive and do not tolerate hot, dry conditions. They come out on cool mornings and following rainstorms.

The Great Plains skink is not intimidated and will bite if disturbed. Depending on its size, the female will lay a clutch of 7 to 24 eggs, usually in an excavated nest under a rock. Their primary diet is caterpillars, grasshoppers, spiders, and beetles—which they locate by sight or smell.



*Mature Great Plains skink.*



*(Clockwise from upper left): a juvenile develops stripes but keeps the bright blue tail; very young Great Plains skinks are blue-black to jet black with a bright blue tail; immature Great Plains skink.*

## Snakes

### Family Colubridae

Most of the snakes in the area belong to a single family, Colubridae. In New Mexico, there are 36 species of 31 genera that make up 78% of the snake fauna of the State. In Los Alamos County and surrounding areas there are 13 species. This family of snakes is sometimes called "harmless." A few have toxins that they inject into their prey but are not a threat to humans. Some kill the prey by constriction. Snakes like the hognose are slow moving, and others such as whipsnakes move very rapidly. Most are secretive and often not seen during the day.

- Ringneck snake *(Diadophus punctatus)*
- Great Plains rat snake *(Elaphe guttata)*
- Western hognose *(Heterodon nasicus)*
- Night snake *(Hypsiglena torquata)*
- Common kingsnake *(Lampropeltis getula)*
- Milk snake *(Lampropeltis triangulum)*
- Smooth green snake *(Liochlorophis vernalis)*
- Coachwhip *(Masticophis flagellum)*
- Striped whipsnake *(Masticophis taeniatus)*
- Gopher snake *(Pituophis melanoleucus)*
- Blackneck garter snake *(Thamnophis cyrtopsis)*
- Western terrestrial garter *(Thamnophis elegans)*
- Common garter snake *(Thamnophis sirtalis)*
- Mountain patchnose snake *(Salvadora grahamiae)*

### Family Viperidae—Vipers

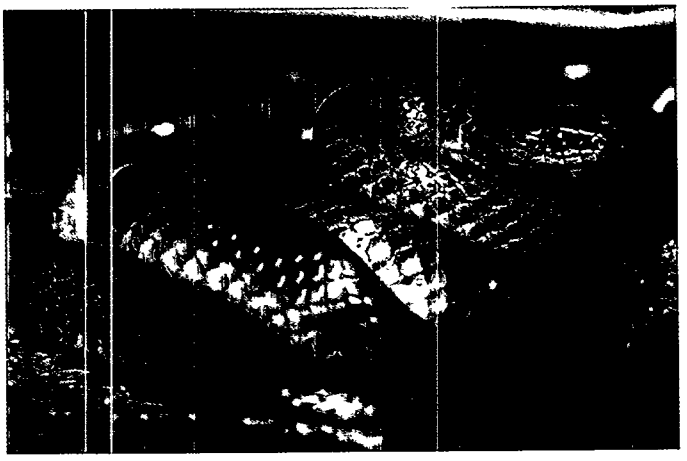
There are two species in the Viper family occurring in the area: western diamondback rattlesnake and the western rattlesnake. Most of the vipers can vibrate the tail rapidly, making a rattling sound, only rattlesnakes have a resonator or rattle to amplify the vibrations. These snakes have a highly evolved injection system for venom, acting much like a hypodermic needle. These snakes are very poisonous, and if you are bitten, measures must be taken to neutralize the toxins.

- Western diamondback rattlesnake *(Crotalus atrox)*
- Western rattlesnake *(Crotalus viridis)*

# Ringneck Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Diadophis punctatus* |
| Common Name: | Ringneck Snake |

The range of the ringneck snake stretches south from Nova Scotia to the Florida Keys and west to the Pacific Coast. However, parts of the Continental US are not included in the range because moist conditions are required. In New Mexico this snake can be found all over except in some northwest and north-central areas. Our specimen was found under a log in Ancho Canyon along the stream channel.

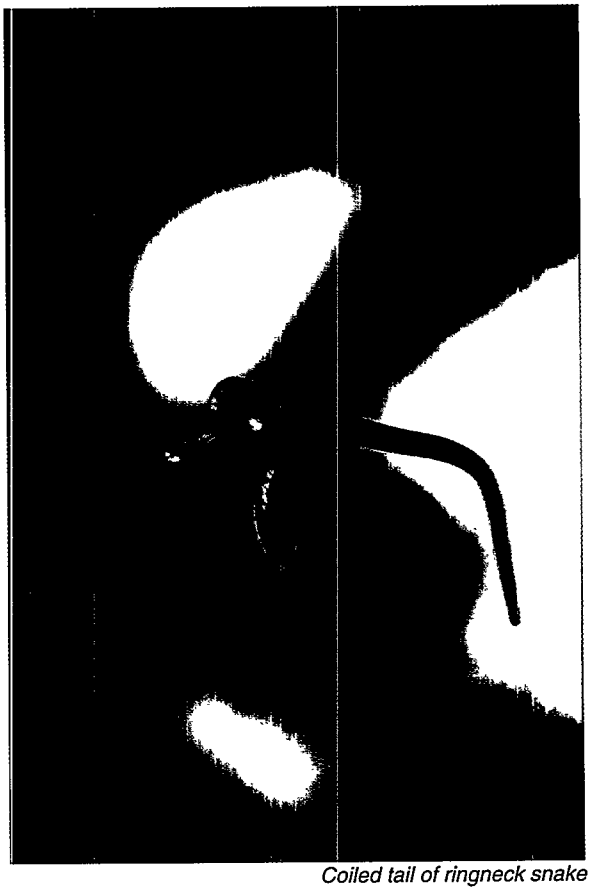


This slender snake is between 20 and 75 cm (8 to 30 in.) in length. It is grayish to black on top with a bright yellow, red, or orange underbelly—usually with black spots—and a yellow, cream, or orange ring around its neck. This species is sometimes called a "thimble snake" because it has a habit of coiling the tail when threatened.

This snake is rarely seen during the day. It can be found under flat rocks or other items that are used for cover and to help keep it cool. When this snake is held, it will release musk, feces, and uric acid. In some populations, rough handling can cause the snake to perform a sequence of actions designed to affect its release. The snake will energetically twist and contort. It will hide or cock its head and rotate its eyes. Finally, it will suddenly go limp into an upside-down position that exposes its bright-colored underside.

The female produces eggs in early June and lays them in mid-June to late July. However, the timing is dependent on the weather patterns of its home range. Egg numbers can range from 1 to 10 with an average of four.

Food sources include small invertebrates and vertebrates. Earthworms and salamanders are generally the principle diet.



*Coiled tail of ringneck snake*

*(Clockwise from upper left): ring around neck of the ringneck snake is characteristic; colored underbelly of the snake; ringneck snake; ringneck snake hiding under debris.*

# Great Plains Rat Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Elaphe guttata* |
| Common Name: | Great Plains Rat Snake |

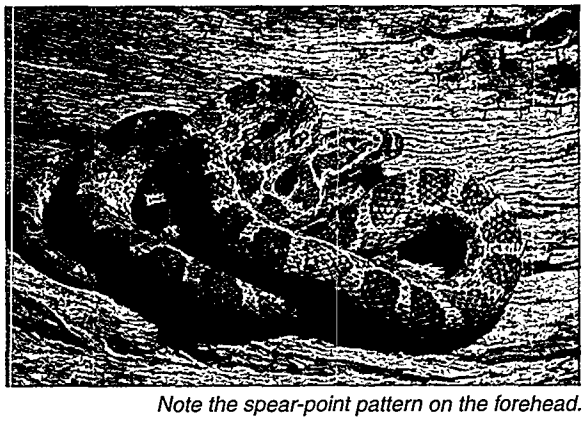
The range of this species includes all of Texas and Oklahoma, most of Kansas, Missouri, and Arkansas, the eastern half of New Mexico, and the southeastern portion of Colorado. In New Mexico this species occurs at elevations up to 2200 m (7260 ft) that include two important components—a constant water source and good daytime cover.

This long slender snake—from 60 to 180 cm (24 to 72 in.) in length—has grayish or brown patches outlined in black on a light gray background. Its belly has black squares. One clear identifying feature is a spear-point pattern between the eyes.

Great plains rat snakes are powerful constrictors and good climbers. They search for small mammals, lizards, birds, and bird eggs, sometimes in barns and abandoned structures, but usually on the ground or in trees and shrubs.

When first captured the Great Plains rat snake will vibrate its tail, bite, void feces, release contents of anal scent glands, or any combination of these, but will quiet with handling.

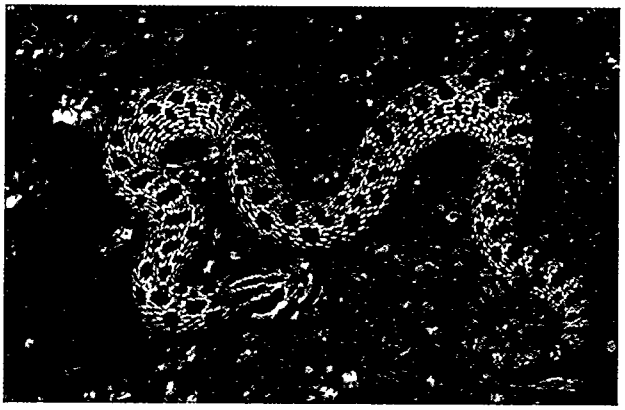
This species mates from March to May. Three to thirty eggs that are white, smooth-shelled, and usually adhesive are laid from July to September.

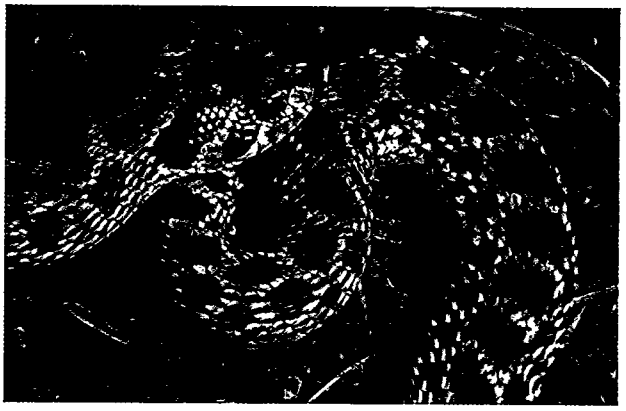


*Note the spear-point pattern on the forehead.*

# Western Hognose Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Heterodon nasicus* |
| Common Name: | Western Hognose Snake |

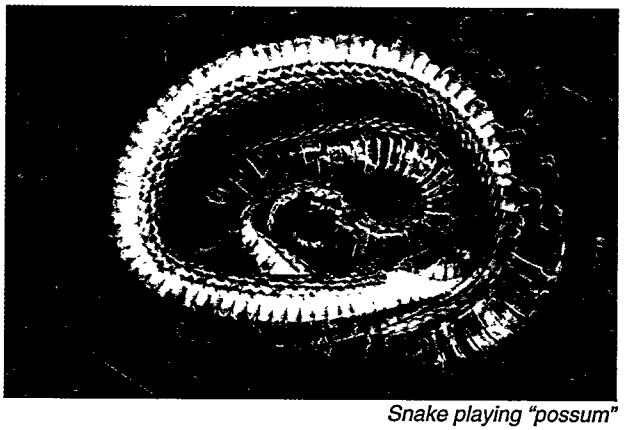




*Note the upturned snout.*

The western hognose snake has a range that stretches north to south along the Great Plains of the central US from southeast Alberta, Canada, to northern Mexico. Its distribution in New Mexico is widespread, but it has not been reported for Los Alamos County even though it may occur here.

This husky snake can grow to 90 cm (36 in.) in length. It has a broad neck and upturned snout that it uses for digging. Dark patches extend from the back of the head to the tail. The underside is white with black on the body and tail.



*Snake playing "possum"*

Hognose snakes will sometimes pretend to be incapacitated when they are disturbed. They will turn up the belly and writhe violently. They will then lay still with an open mouth and lolling tongue. The tail will coil tightly giving the appearance of a head. Other times the snake may expand the head and neck and strike with an open mouth. For this reason it is sometimes called a "puff adder" or "blow snake."

These snakes normally hunt during the day when the soils are warm. They eat frogs, salamanders, lizards, snakes, turtles, and reptile eggs. The enlarged teeth at the rear of the upper jaw are used to hold or deflate toads and inject toxic salivary secretions into the prey.

# Night Snake

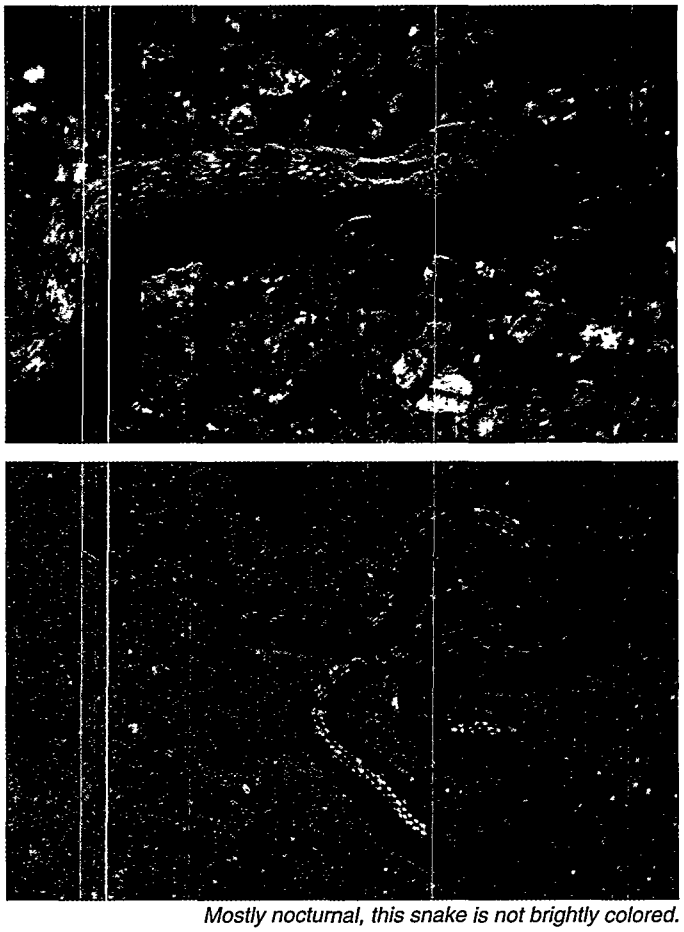
| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Hypsiglena torquata* |
| Common Name: | Night Snake |

The range of the night snake begins in the north at central Washington and extends south and east, encompassing the southwestern US, Baja California, and central Mexico. In New Mexico, this species is found throughout the state but is more numerous in the desert lowlands. In this area, the night snake is found in montane woodland habitat.

Unlike many other snakes in this area, the night snake is almost exclusively nocturnal. As a result, physical characteristics are conducive to nighttime activities. Its eyes have elliptical pupils. Body colors are pale gray, light brown, or beige with dark gray or brown patches on the back and sides and possibly on the neck. The belly is yellowish or white. The adults measure 4.8 to 10.5 cm (12 to 26 in.) in length.

The species is found in a variety of habitats including forest and woodlands. They can be found in rocky areas—cracks in outcrops—or areas with surface debris, either natural or human-produced. This snake will not defend by biting but does have enlarged rear teeth and mild venom used for subduing prey. They feed mainly on lizards, small snakes, and amphibians.

These snakes are egg layers, laying a clutch of 3 to 9 eggs from April to August.



*Mostly nocturnal, this snake is not brightly colored.*

# Common Kingsnake

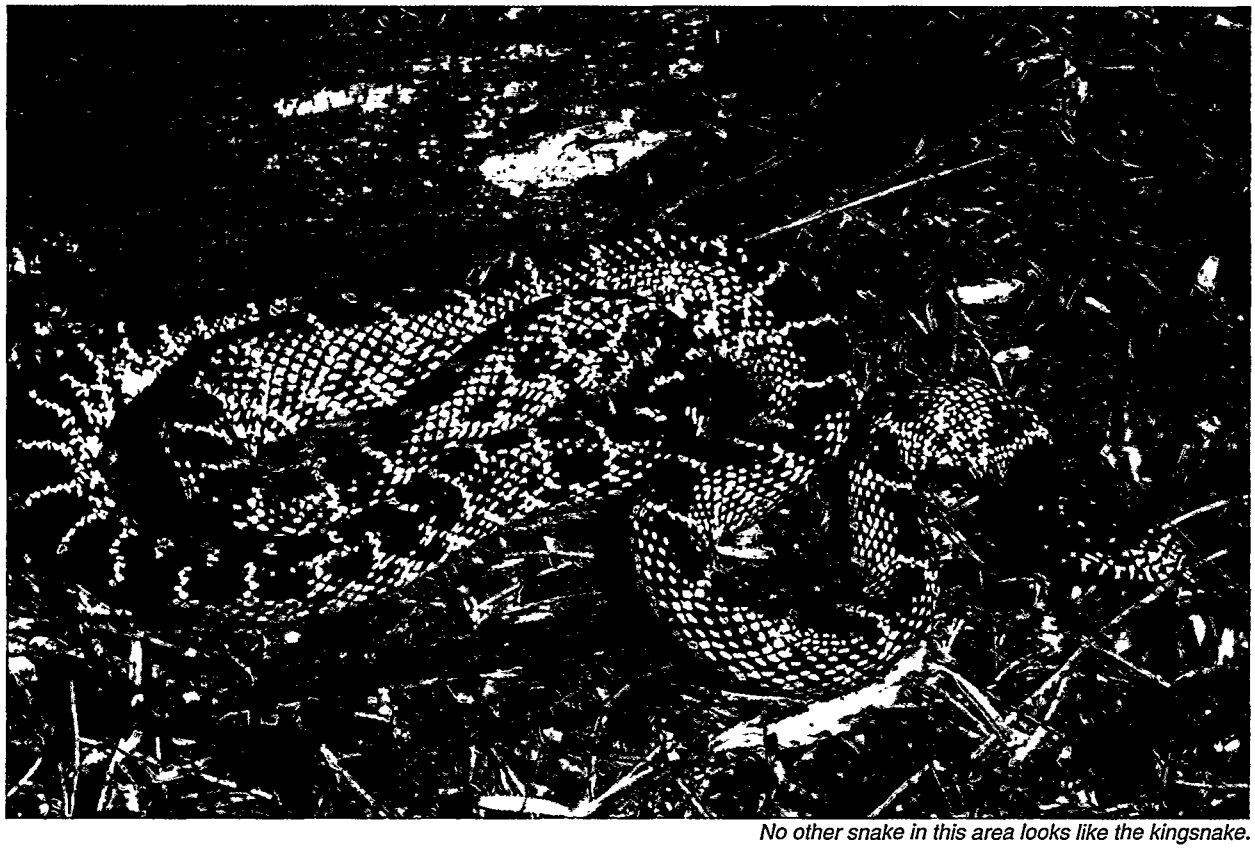
| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Lampropeltis getula* |
| Common Name: | Common Kingsnake |

This snake ranges from the Pacific to the Atlantic in the southern half of the US into Baja California and Zacatecas, Mexico. In New Mexico, the common kingsnake has been found throughout except at elevations above 2070 m (6900 ft). This snake has not been reported for Los Alamos County but it has been found at lower elevations in Santa Fe and Rio Arriba counties.

This snake may grow up to 205 cm (82 in.) in length. Its unique pattern consists of alternating bands of plain black or dark brown and white or pale yellow resembling the links of a chain. This pattern and coloration should not be confused with any other species in this area.

This species is chiefly terrestrial but may climb. They are active in the morning and late afternoon except in hot periods of the summer. When disturbed they may strike, hiss, and vibrate the tail. They will roll up in a ball with the head at the center.

Kingsnakes eat lizards, small turtles, reptile eggs, frogs, birds, and bird eggs. They kill their prey by constriction. They are immune to snake venom and are known for subduing and eating venomous snakes.



*No other snake in this area looks like the kingsnake.*

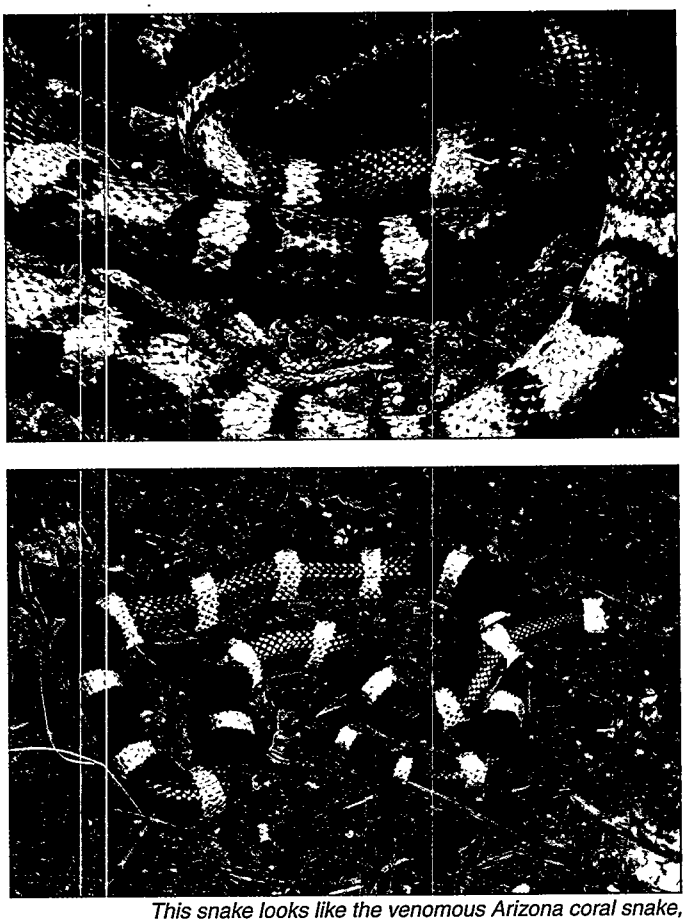
# Milk Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Lampropeltis triangulum* |
| Common Name: | Milk Snake |

The milk snake has a fairly extensive distribution all up and down the East Coast of the US west to the Rocky Mountains and south through Mexico and Central America into Columbia and Venezuela. In New Mexico, this snake has not been reported west of the Rio Grande except in Sandoval and Rio Arriba counties. It has not been reported in Los Alamos County.

This secretive snake can grow to 195 cm (78 in.) long and is found under rotting logs, stumps, and damp trash. The body has alternating red and cream bands with a black band in between—having similar coloration as the venomous Arizona coral snake (*Micruroides euryxanthus*) but slightly different placement of the bands. The snout is black but may be spotted with white.

This species got its name from the old belief that the snake would milk the cows in the barn. The snakes are definitely more interested in the natural prey that will congregate around these types of structures including lizards, small snakes, and rodents.



*This snake looks like the venomous Arizona coral snake, which does not occur in this area.*

To remember the difference between this snake and the Arizona coral snake, here's a rhyme:

*Red touch yellow*
*Kill a fellow*
*Red touch black*
*Friend of Jack*

# Smooth Green Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Liochlorophis vernalis* |
| Common Name: | Smooth Green Snake |

The distribution of this snake is widespread throughout the US. However, only in the northeast is its range continuous. In the southwest—Utah, Colorado, and New Mexico—its range is discontinuous with isolated populations occurring where suitable habitat exists—open grassy areas with water or adjoining rocky slopes at elevations from 1525 to 2450 m (5032 to 8086 ft). In New Mexico, the presence of this species has been reported in the Sangre de Cristo, Jemez, Manzano, and Sacramento Mountains.

This plain green snake has an underbelly of white or yellow. Its scales are smooth as opposed to the rough green snake (*Opheodrys aestivus*) that has scales that are rough. Adult snakes can range from 30 to 65 cm (12 to 26 in.) in length.

This is a gentle species that will be active in the warmest part of the day. Individuals may climb into low vegetation for sunning or foraging—mostly on terrestrial small-bodied insects and spiders—where ground vegetation is dense.

Two to eighteen eggs are laid in July and August. Females may nest communally where green snakes are abundant and the nest site is optimal. Eggs are white, thin-shelled, and mostly oval, although they may vary in size and shape. Sometimes the embryos have developed inside the shell to such an extent before being laid that they hatch after a couple of days rather than a couple of weeks.

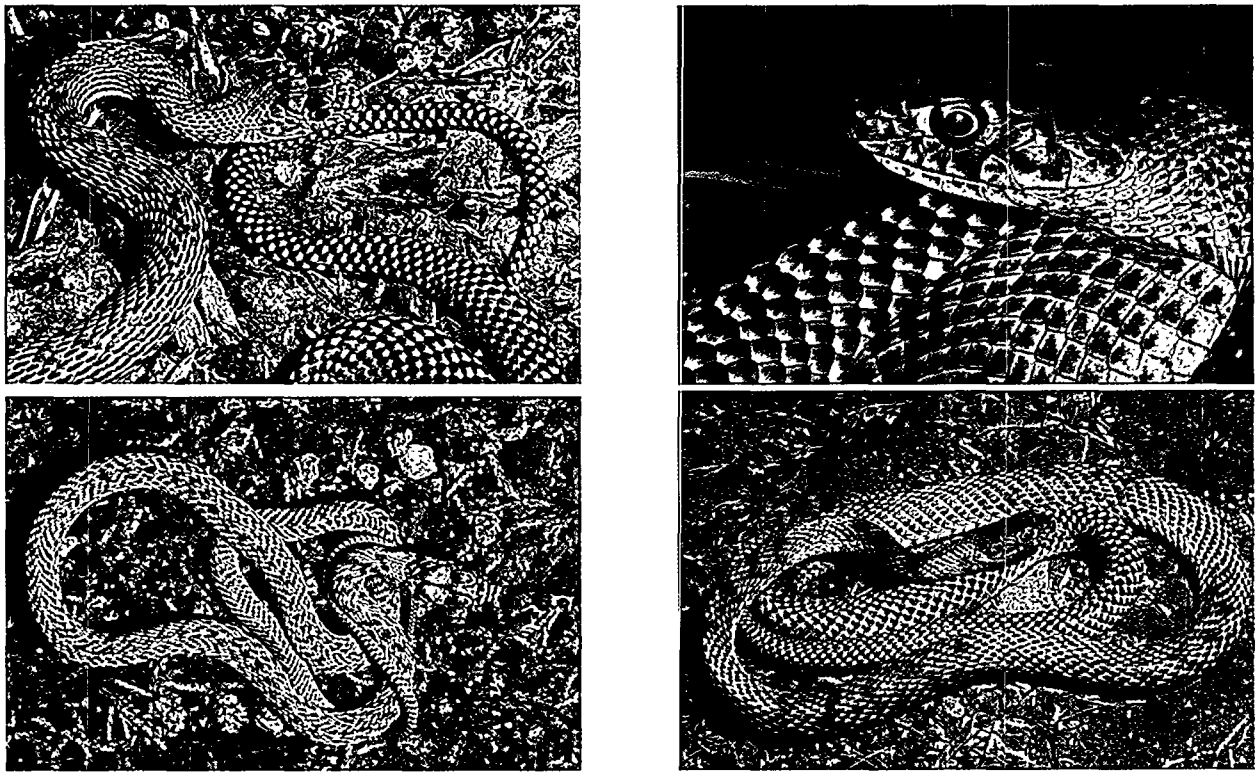
# Coachwhip

Family Name: Colubridae
Common Name: Colubrids
Scientific Name: *Masticophis flagellum*
Common Name: Coachwhip

This species, comprised of seven subspecies, ranges widely coast to coast in the southern half of the US and into central Mexico and the southern end of Baja, California. Two of the subspecies—central (or western) coachwhip (*M. f. testaceus*) and lined coachwhip (*M. f. lineatulus*)—can be found throughout New Mexico except in mountainous terrain above 2200 m (7260 ft). On occasion, here in Los Alamos County, people have reported seeing a long slender snake that moves quickly, sometimes climbing trees. They have probably encountered the coachwhip.

This slender snake is one of the longest and fastest snakes found in New Mexico. Its length varies between 90 and 255 cm (36 and 102 in.), and it has been clocked at 5.75 km/h (3.6 mi/h). Body coloration varies from tan, gray, pink, reddish brown, or almost black. Young coachwhips are strongly marked with dark crossbars, which fade with age.

When cornered, coachwhips will defend offensively by advancing towards the threat. When grasped, it will thrash and twist and bite, causing lacerations as it maintains a hold on the skin—a characteristic that is unlike most snakes. Whipsnakes climb into bushes and heavily-branched trees—preferring piñon-juniper woodland and sagebrush in this area—to forage, escape predators, or cool down above the hot ground. The snake preys mostly on vertebrates, including lizards, snakes, small mammals, birds, frogs, young turtles, eggs, carrion, grasshoppers, and cicadas.



*Note the various colorations.*

# Striped Whipsnake

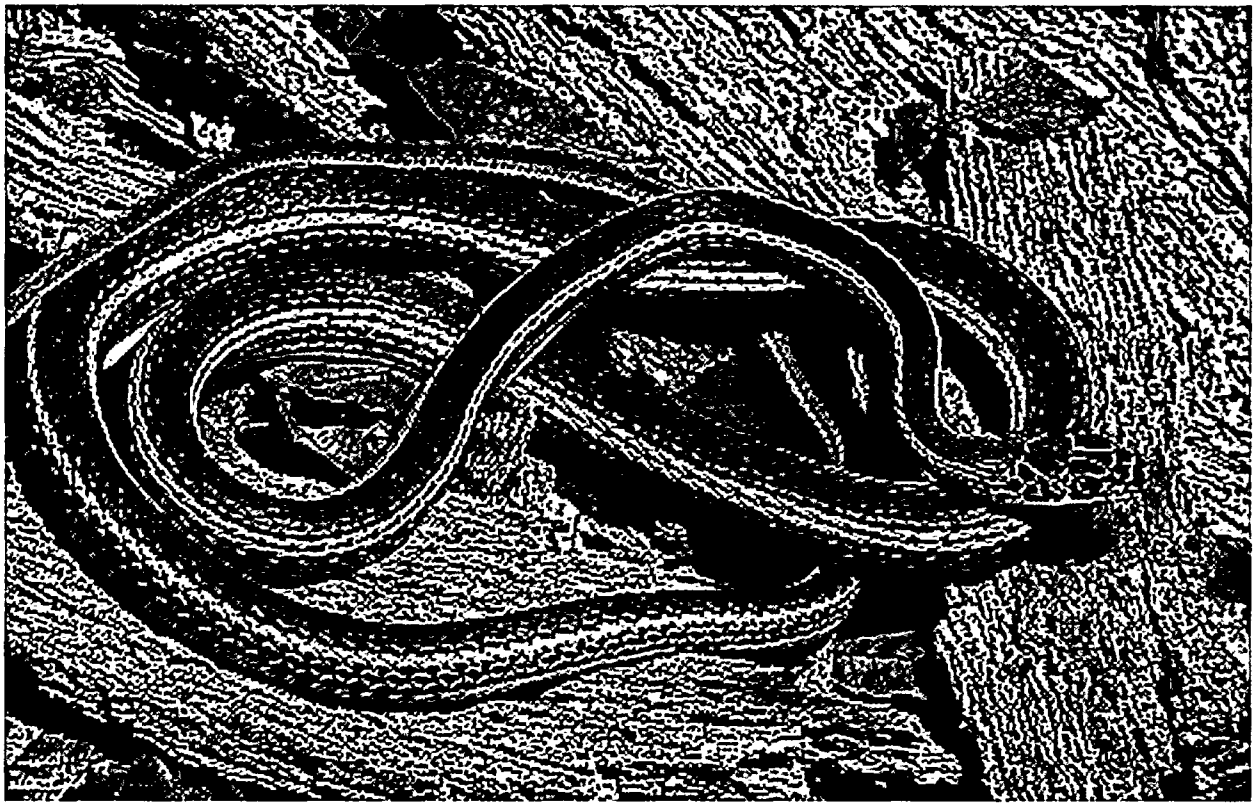
| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Masticophis taeniatus* |
| Common Name: | Striped Whipsnake |

The range of this species begins in the northwest—the southeastern corner of Washington—and extends diagonally to the southeast encompassing most of Nevada and the four corners area through New Mexico into southwest Texas and northern Mexico. In New Mexico, only the eastern edge and the higher elevations do not contain this species. Locally, it may be found within the piñon-juniper woodland and occupies rocky and brushy habitats.

This slender snake has a background color of black, dark brown, or dark gray with four light lines on the sides. Underneath, the snake is white to yellow with pink at the tail. This is an alert, fast-moving species—most active in the morning and late afternoon—that will sometimes bask in shrubs after emerging from their nighttime retreats. They are known to share dens with rattlesnakes.

Egg clutches of 3 to 12 eggs are laid in June and July. The eggs are nonadherent and leathery with a rough surface resembling sandpaper.

Prey for this species includes lizards, snakes, small rodents, birds, frogs, and insects. Since they are climbers, they also forage for birds in shrubs and trees.



# Bullsnake, Gopher Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Pituophis melanoleucus* |
| Common Name: | Bullsnake, Gopher Snake |

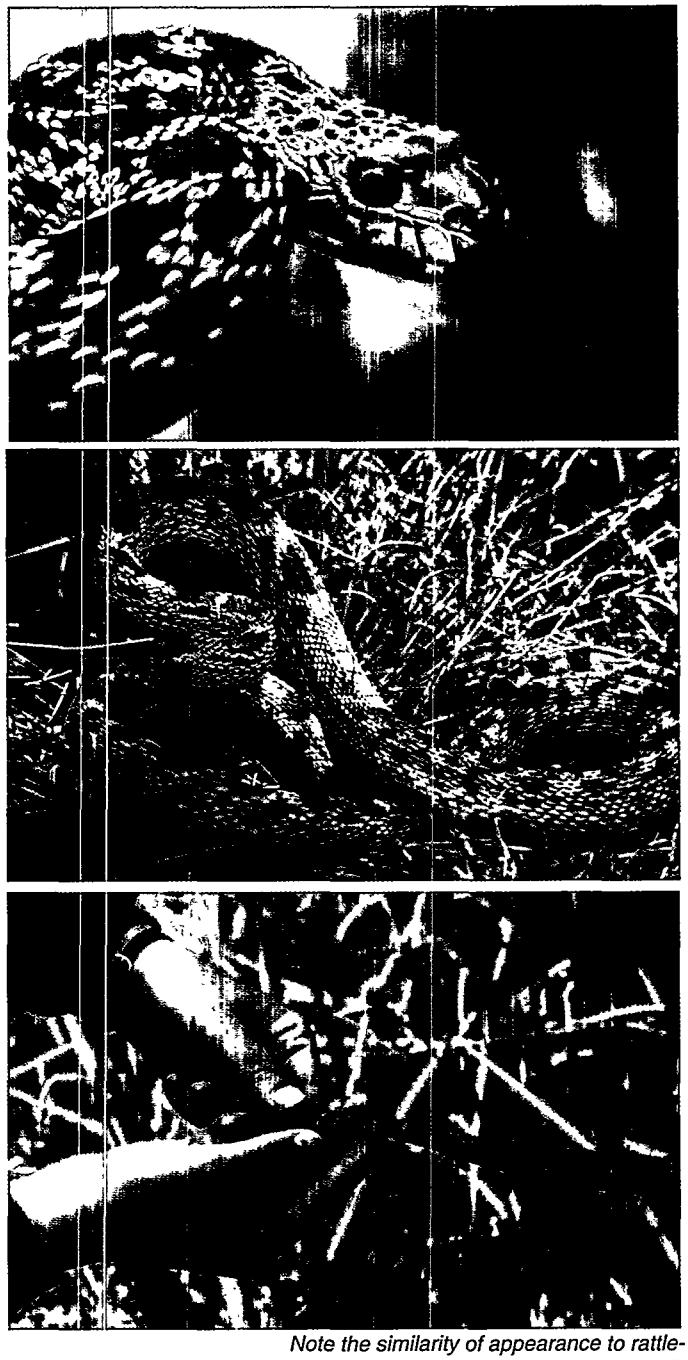
This snake is distributed throughout the continent from southwestern Canada and southern New Jersey to Mexico, Guatemala, and the southern tip of Baja California. In New Mexico it is the most widespread and abundant snake species. It is commonly found on the Pajarito Plateau and has been reported from a variety of habitats. They are most commonly found within the canyons where rodent activity is abundant.

This snake, large and slow moving, may exceed 250 cm (100 in.) in length. The body color is cream or yellow with large light brown to dark brown patches or saddles. A dark band usually extends from the eye to the angle of the jaw.

When confronted this species will display defensive actions that mimic the actions of a rattlesnake. It will flatten its head to a triangular shape, coil and puff up its body, vibrate the tail, hiss loudly, and strike repeatedly. Other times the snake is very docile and can be easily handled.

This snake is most active during the day but will become more active at night under hot and/or dry conditions. They are good at climbing trees and shrubs. They also burrow, sometimes sharing dens with rattlesnakes and other species. Gopher snakes do not eat or drive away rattlesnakes as commonly believed, although they may compete for the same prey. Both of these species are important to rodent control.

This species lays clutches of 3 to 19 eggs, depending on the body size of the adult.



*Note the similarity of appearance to rattlesnakes but without rattles on the tail.*

# Blackneck Garter Snake

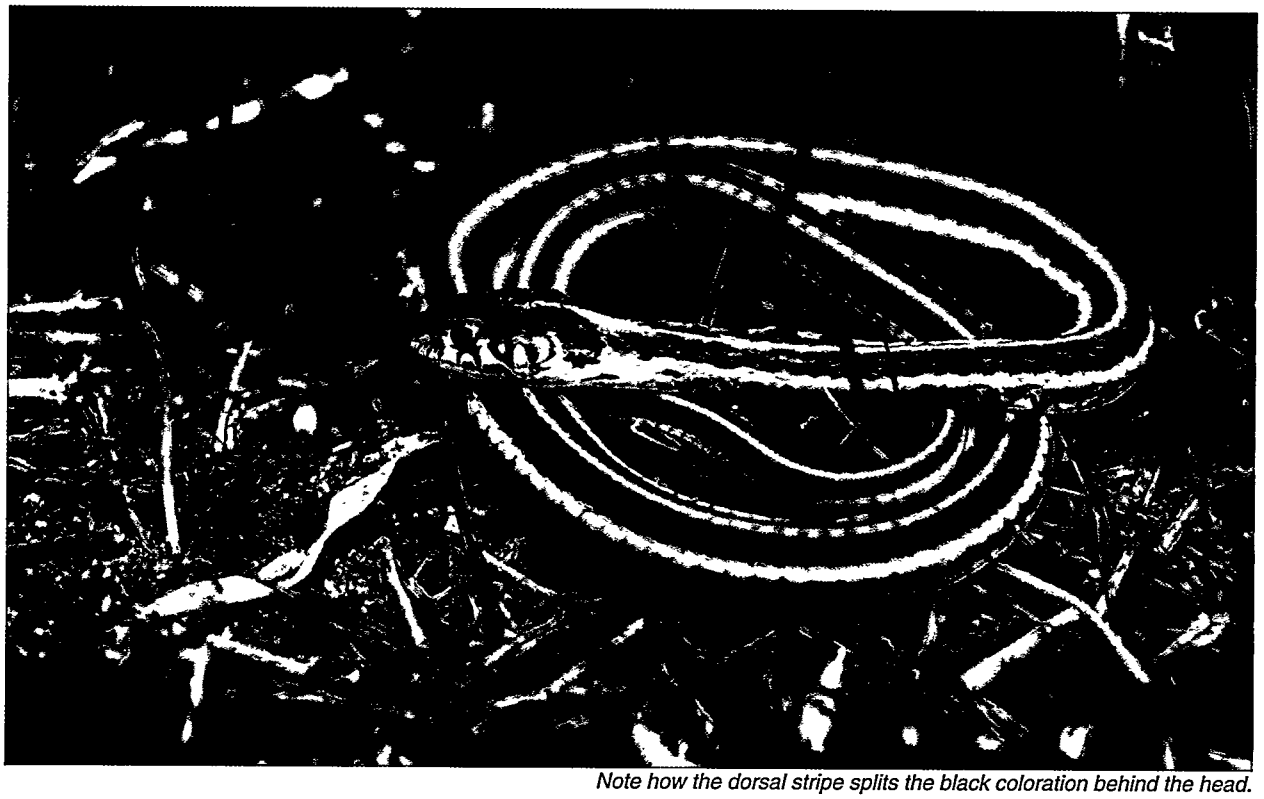
| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Thamnophis cyrtopsis* |
| Common Name: | Blackneck Garter Snake |

The distribution of this species ranges from southern Colorado and Utah through Arizona, New Mexico, and Texas into Mexico and northern Guatemala. This species can be found in all of New Mexico at elevations from 1125 to 2400 m (3712 to 7920 ft). However, on the Pajarito Plateau the blackneck garter snake is less common than the western terrestrial garter snake (*T. elegans*).

This snake normally ranges from 40 to 70 cm (16 to 28 in.) in length. The most striking characteristic is a white or yellow stripe running down the vertebra; the stripe becomes orange behind the head and separates a black patch on the neck. The head is always gray. There are two rows of alternating dark spots, resembling a checkerboard pattern, between less-prominent stripes along each side of the body. The belly can be brown but is usually white with a light greenish or bluish coloration.

Quiet and shallow rocky pools along watercourses are preferred by these snakes and also by the tadpoles that serve as their favorite prey, although small fishes, skinks, crustaceans, and earthworms are readily eaten when available. This species is generally found near water in the daytime but may also be active at night. Overnight cover sites include exposed roots and crevices along stream banks, rodent holes, and vegetative debris created by flooding. When disturbed they may take cover in grassy areas or swim away.

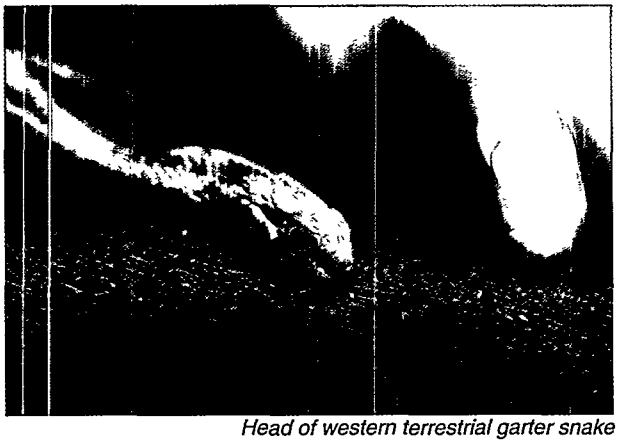
These snakes are viviparous, that is, the young are born alive, usually in or near water and can number from 3 to 22.



*Note how the dorsal stripe splits the black coloration behind the head.*

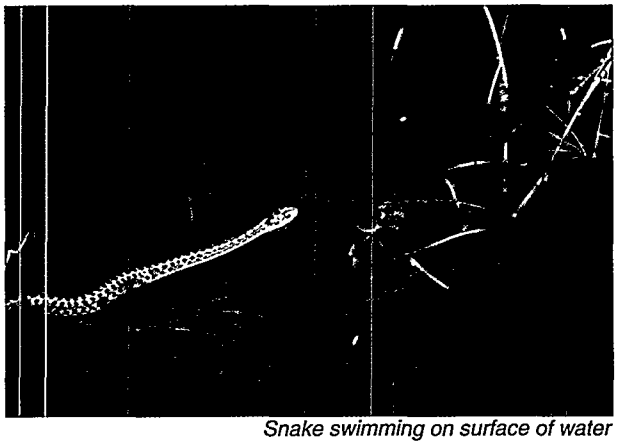
# Western Terrestrial Garter Snake

Family Name: Colubridae
Common Name: Colubrids
Scientific Name: *Thamnophis elegans*
Common Name: Western Terrestrial Garter Snake



*Head of western terrestrial garter snake*

This species is one of the most widespread and frequently encountered snakes where moist habitats exist in western North America from southern Canada to northern Mexico. In New Mexico, this snake can be found in the mountains and the high river valleys. On the Pajarito Plateau, it is the most common garter snake.



*Snake swimming on surface of water*

The adults range from 45 to 75 cm (18 to 30 in.) in length. The coloration of the back varies from dark brown to greenish brown to tan to gray. The stripe along the vertebra is always well defined, narrow, and white to yellow. The stripes along each side are dull yellow to tan. Two rows of alternating rounded spots lie between the stripes.

This is the most terrestrial of the New Mexico garter snakes. It is often found close to surface water, but is commonly found many miles away. Even when this snake is near water, it will often try to escape to dense vegetation on land. When captured, this species typically voids excrement and anal gland secretions. This garter snake may attempt to bite, but its small size makes this defense ineffective against large predators and humans.

Garter snakes are mainly active in the daytime, but will forage at night when weather conditions and food availability is right. They will hibernate in the same dens as the western rattlesnake (*Crotalus viridis*), but enters later and leaves earlier.

Young are born in July through September and number 3 to 21. However, this species may not reproduce each year.

This species has the most general feeding habits of all garter snakes. It is carnivorous, with fishes, tadpoles, salamanders (including Jemez Mountains salamander), lizards, birds, mice, shrews, chipmunks, earthworms, slugs, snails, leeches, and insects being recorded as prey.

# Common Garter Snake

| | |
|---|---|
| Family Name: | Colubridae |
| Common Name: | Colubrids |
| Scientific Name: | *Thamnophis sirtalis* |
| Common Name: | Common Garter Snake |

Stebbins (1985) states that the common garter snake can claim the northernmost distribution boundary—central Canada—of any reptile of the Western Hemisphere. This range also extends coast to coast. However, this species is excluded from much of the arid southwestern US. In northern New Mexico, this species is primarily located along the Rio Grande and tributaries. Locally, the common garter snake has been found in Santa Fe and Rio Arriba counties but not Los Alamos County.

This is the largest garter snake found in New Mexico and can grow to 130 cm (52 in.) in length. It can be identified as a garter snake by distinctive stripes down the back and sides and distinguished from other garter snakes by red markings between the stripes and bigger eyes.

Generally, this species can be found where permanent water—natural or constructed—is close by. They have been found along rivers, marshes, ditches, farms, and city lots where food is not scarce.

*Note the red coloration below the stripe.*

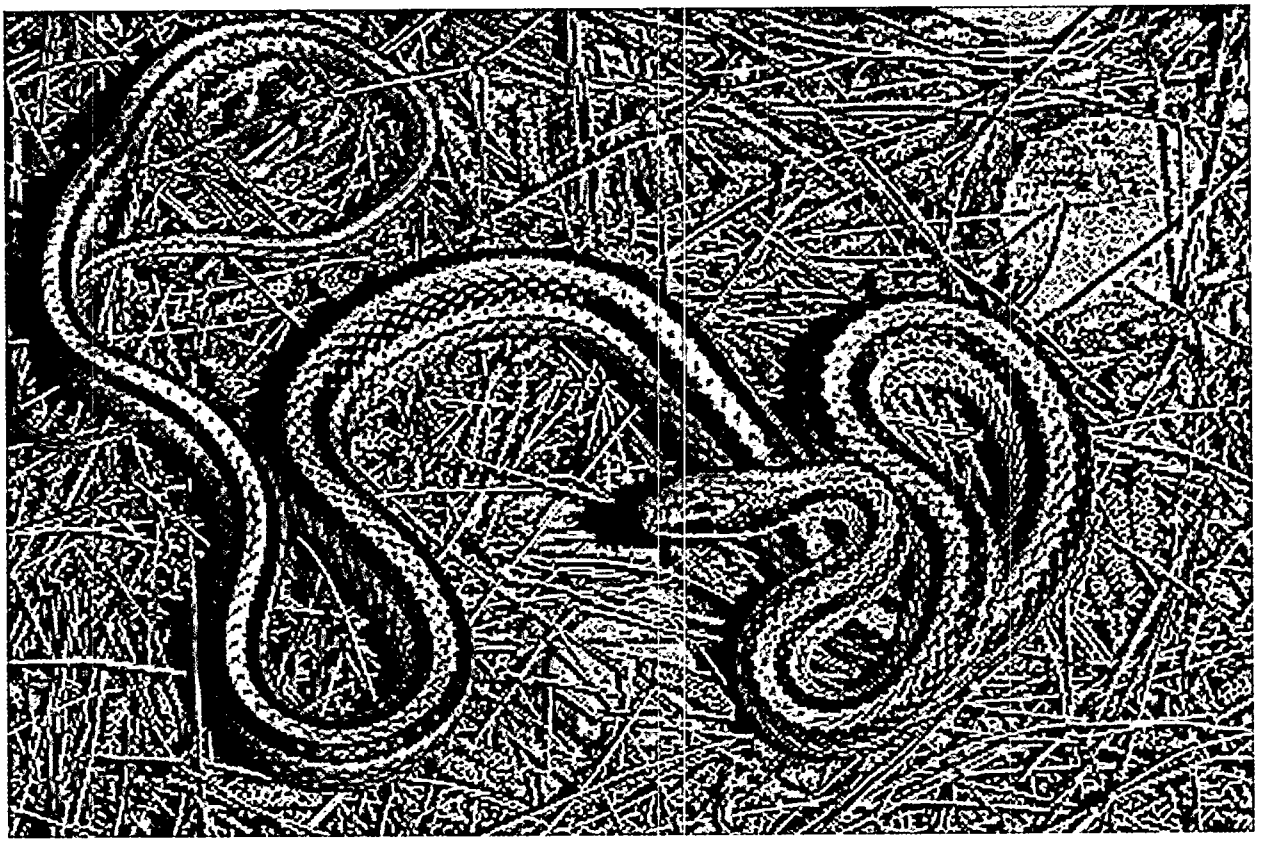
# Mountain Patchnose Snake

| | |
|---|---|
| Family: | Colubridae |
| Common Name: | Colubrids |
| Species: | *Salvadora grahamiae* |
| Common Name: | Mountain Patchnose Snake |

The mountain patchnose snake is found from Arizona across New Mexico into central Texas and south into northern Mexico. It is widely distributed in New Mexico except in the northern corners and along the eastern border of the state. The distribution is spotty and is rarely below 1370 m (4500 ft).

This species is slender, measuring between 55 and 75 cm (22 and 30 in.) but occasionally up to 90 cm (48 in.). The body color is pale gray or olive with two wide dark stripes extending from head to tail. Underneath, the venter is cream or white.

This snake is most often found in rough terrain, along arroyos, in canyons, or along rocky flats at the base of mountains in the foothills where trees and shrubs are abundant. It is similar to whipsnakes with constant, fast-moving activity. It is most active during the morning hours and is usually ground dwelling, but will climb vegetation to forage, bask in the sun, or escape predators. Its diet consists of lizards, lizard eggs, and small mammals.



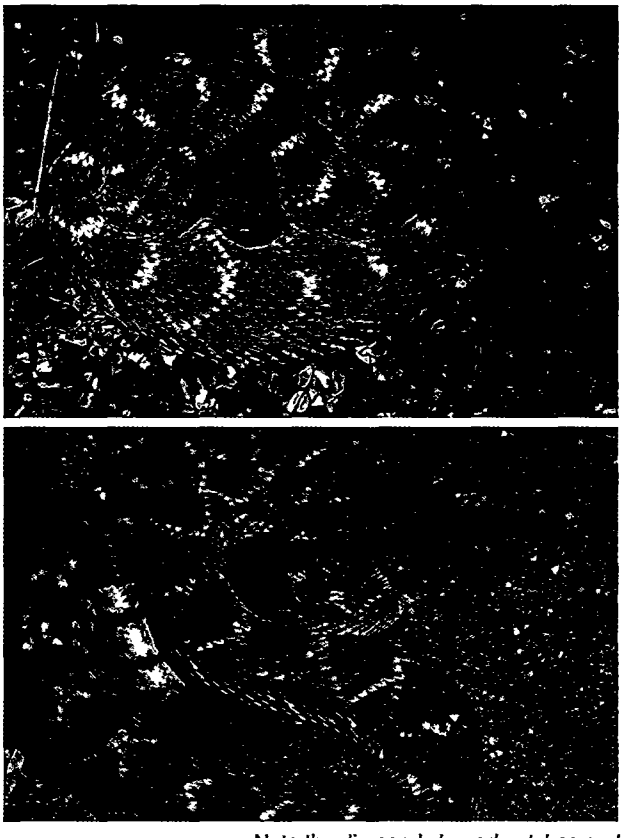
# Western Diamonback Rattlesnake

| | |
|---|---|
| Family Name: | Viperidae |
| Common Name: | Vipers |
| Scientific Name: | *Crotalus atrox* |
| Common Name: | Western Diamondback Rattlesnake |

This species ranges to the west from southeast California to Arkansas and east Texas and to the north from central Mexico through Arizona, New Mexico, and Oklahoma. It is commonly found in White Rock Canyon. On one field week we encountered 13 individuals from 0.6 m (2 ft) to over 1.2 m (4 ft) long.

The western diamondback is the largest of all southwestern rattlesnakes. The snake is easily recognized by the conspicuous black and white band on the tail, thus the origin of the common name "coon-tail" rattler. Overall, the colors are muted with a background color from light to dark gray or tan to reddish or pink. There are 24 to 45 brownish, light-bordered, diamond-shaped patches on the back that tend to become obscure toward the tail. There is a lateral stripe behind the eye that ends near or well in front of the corner of the mouth.

This venomous snake will try to escape when threatened but will quickly defend itself if escape is impossible. The snake will coil, remaining in place, and will raise the head and front part of the body well above the ground. Bites are very serious and may be fatal even when treated.



*Note the diamond shaped patches and the black and white coon tail.*

These rattlesnakes frequently congregate in winter den sites on rock hillsides. These dens are usually permanent structures and may include abandoned mines, small caves, or deep cracks in the rock that may also be occupied by other species.

This viviparous species bears young in late July or August. Females may exhibit parental care of their young for a short time after birth. The newborn snakes can range from 20 to 33 cm (8 to 13 in.).

The snake eats a wide variety of vertebrate prey. They will lay in wait along rodent trails and ambush their prey. Rattlesnakes forage mostly at night but can forage in the day in spring and fall. Prey is detected by smell or infrared reception. Woodrats and pocket mice are the most common prey, but rock squirrels, pocket gophers, and rabbits may also be taken. A prey quantity equivalent to 93% of the body mass of this rattlesnake is sufficient for annual energy requirements (Beck 1995). This requirement translates to two of three large meals a year.

# Western Rattlesnake

| | |
|---|---|
| Family Name: | Viperidae |
| Common Name: | Vipers |
| Scientific Name: | *Crotalus viridis* |
| Common Name: | Western Rattlesnake |

The western rattlesnake has the most extensive range of any North American rattlesnake. From north to south the range extends from southwest Canada to Baja California and east to west from western Iowa and central Kansas to the Pacific coast. It is found statewide in New Mexico from 900 to 2600 m (2970 to 8580 ft) in elevation and is common in the ponderosa pine forests and piñon-juniper woodlands. In Los Alamos County, we have encountered it in the rocky slopes of canyons, in cattail marshes, and on the grassy canyon floor.

*This snake is common in ponderosa pine forests and piñon-juniper woodland.*

The light brown to greenish brown color provides a good camouflage. There are 35 to 55 dark brown patches along the back of the body that are bordered in white. The patches gradually elongate from mostly oval in shape to narrow cross bands on the rear third of the trunk not including the tail. Two white lines are on the side of the head; the one behind the eye passes above the corner of the mouth. The belly is white and unspotted.

The species is mostly nocturnal, seeking shelter in rodent burrows or rocky retreats during the hotter parts of the day. They may be seen on warm blacktop roads shortly after sunset.

The species hibernates in rodent burrows or communal rocky den sites that may be occupied by other species of snakes.

This live-bearing snake may have an average of nine young; the size of the litter is related to the size of the adult.

Active foraging around rodent burrows is common. They use a sit-and-wait tactic along rodent trails and may also occasionally eat carrion. Their diet may include birds, bird eggs, lizards, frogs, and insects.

# 7.0 Myths about Amphibians and Reptiles

Amphibians and reptiles have fascinated people from the beginning of time. Stories told around campfires contained animals portrayed as people. The anthropomorphic depiction of animals was partly because people lived close to the earth and valued all living creatures. But the storyteller used lessons through the voice of the animal. Animals solved problems, metamorphosed from animal to human, were involved in creation, and presented lessons about right and wrong, the wise, and the foolish. Frogs, toads, snakes, and even salamanders became embedded in folklore, myths, and legends of various cultures. These themes were picked up by writers such as Aesop, Mark Twain, and many writers for children.

Interesting stories about amphibians and reptiles include

- "Sun-boy and the Monster Frog" from the Jicarilla Apache (Edmiston 1998)
- "The Woman Who Married a Frog" from the Tlingit (Caduto and Bruchac 1992)
- "The Boy and the Rattlesnake" from the Apache (Caduto and Bruchac 1992)
- "Coyote Takes Water from the Frog People" from the Kalapuya (Erdoes and Ortiz 1984)
- "The Girl Who Married Rattlesnake" from the Pomo (Erdoes and Ortiz 1984)
- "The Artists and the Snakes" from the Hopi (Applegate 1988)

Here are some old beliefs that are not true.

- *Rattlesnakes always rattle when disturbed.*
- *Gopher snakes eat rattlesnakes.*
- *Gopher snakes scare away rattlesnakes.*
- *The rattles on a snake can tell its age.*
- *Rattlesnake bites always kill!*
- *Snakes will "chase" you.*

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