

# THE BLUNT-NOSED LEOPARD LIZARD HYBRID IN BALLINGER CANYON

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**ABSTRACT:** A brief history of the paleontology stratigraphy of Ballinger Canyon, during the late Miocene and early Pliocene, and the assumed recent hybridization between the Blunt-nosed Leopard Lizard (*Gambelia silus*) and the Leopard Lizard (*Gambelia wislizenii*) approximately 20,000 years ago. The transitional phase from livestock grazing to the destructive use by off-road motor vehicles, and the resource management attempts by the U.S. Forest Service is discussed in some detail. The needs of the Blunt-nosed Leopard Lizard (*Gambelia silus*) an endangered species, its life history and spacial relationship to the hybrid form in Ballinger Canyon is considered.

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## INTRODUCTION

The Blunt-nosed Leopard Lizard (*Gambelia silus*), an endangered species, and the Leopard Lizard (*Gambelia wislizenii*) are considered distinct species on the basis of morphological, biological, ecological and behavioral differences. A population of presumed hybrid origin occurs in a narrow ecotone between the California steppe and Great Basin pinyon-juniper woodland (Montanucci 1970).

Dr. Montanucci believes that *Gambelia silus* and *Gambelia wislizenii* from the San Joaquin Valley and Mojave desert respectively, hybridize in the upper Cuyam River Valley in California. Ballinger Canyon one of the major drainages in the southeastern portion of the Cuyama Valley, has been subjected to erosional destruction by heavy use of off-road motor vehicles for the last ten years.

A team of five biologists completed a study in December of 1971 within this area and provided a plan, "ORV and Wildlife in Ballinger Canyon", to the Forest Supervisor of Los Padres National Forest in June of 1972.

Two of the major recommendations by the Forest Wildlife Biologist was to complete a five to ten year environmental analysis of Ballinger Canyon and adhere to Executive Order 11644 (2/8/72), "Use of Off-road Vehicles on the Public Lands".

These recommendations were not accepted by the Forest Supervisor and on December 15, 1976 he approved an Environmental Analysis Report designating Ballinger Canyon an, "Open use area". The Forest Supervisor issued a, "Negative Declaration Statement", which stated, "The proposed policy will not significantly affect the quality of the environment. No environmental statement is needed".

In a news release on August 24, 1978, Assistant Secretary of Agriculture, M. Rupert Cutler announced a decision to restrict the use of off-road vehicles on national forest service lands in Ballinger Canyon.

## Study Area

The picturesque badlands exposures in the southeastern third of the Cuyam Valley, California, includes a 5,000 ft. succession of conformable nonmarine deposits varying in age from middle Miocene to late Pleistocene. The fossil mammal assemblages collected from the lower 1200 ft. section of the Caliente Formation included such mammals as *Sciruropterus*, *Perognathus*, *Peromyscus*, *Vulpes*, *Mustela*, *Pliohippus* and a peccary.

The nature of these faunas indicate a possible subtropical woodland environment. Twenty thousand years ago it is believed the ranges of the Leopard Lizard and the Blunt-nosed Leopard Lizard (BNLL) overlapped in the vicinity of Ballinger Canyon and thus the hybrid form became established. Due to climatical changes it later became isolated and now perhaps represents a relic area of the past.

## History

Large bands of sheep grazed this area shortly after the Forest Reserve was first established in 1897. In early grazing history the Ballinger Canyon Allotment was one of several units receiving yearlong use and extended from the homestead era until about 1940 when use by cattle replaced the past use by sheep.

Due to heavy utilization by livestock and the severe drought of 1948 and 1949, livestock use was deferred during the 1949 and 1950 grazing season. Yearlong use of cattle was discontinued at this time but term permits were issued through the following years until the permit was terminated in 1968.

The 1961 Multiple Use Management Plan (MUMP) Guides for the National Forests of Southern California (1), listed wildlife habitat as the key value of the Desert Slope Zone, and the aim was to improve vegetation and high priority would be given measures to improve wildlife. In 1962 the MUMP for the Los Padres National Forest included an objective to secure favorable conditions for the protection and harvest of wildlife. The Southern California Subregional Guide for the MUMP in 1968 stated, as management direction, to provide high quality habitat conditions for wildlife, avoid soil damage and protect and improve vegetative cover.

In 1970 the MUMP changed the emphasis from the protection of vegetation and wildlife to concentrated cycle activity, with provisions for repairing any watershed damage.

Since 1970 until the present time the heavy concentrated use of ORV's has contributed to major destruction of the flora and fauna and the critical habitat for the Blunt-nosed Leopard Lizard hybrid.

## Life Cycle

The hybrid form of the BNLL exhibits the same basic biological functions as the BNLL. It is a relative large, longlived species and is active in the late spring, summer and early fall whenever the air temperature ranges between 25-35 C and soil temperatures range between 30-50 C.

The males size ranges between 90-118 mm, being somewhat larger than the females 87-107 mm. The young when hatched from a normal clutch of two eggs are about 43 mm in size. The eggs are laid in the end runs of rodent burrows, such as the Kangaroo Rat (*Depidomys agilis*).

The males are polygamous, highly aggressive and territorial during the breeding season with several females using portions of one male's territory. The adult lizards are cannibalistic and will eat their own offspring, as well as other small lizards, up to 75 mm in size. Primarily they are insectivorous and have similar diets as the Great Basin Whiptailed Lizard (*Cnemidophorus tigris tigris*), and the Leopard Lizard (*Gambelia wislizenii*). This diet of crickets, grasshoppers, bees and butterflies make up about 65% of their daily needs. (Whitaker, John O., Indiana State University).



The life zone of the hybrid ranges between 2600 and 3600 ft. where the grassland meets the pinyon-juniper woodland and is about nine miles in extent.

### Results and Discussion

The survival of this hybrid species of the endangered BNLL is in dire jeopardy. The advent of irrigation, primarily for the production of alfalfa in the Cuyama Valley, has resulted in the complete loss of better than 95% of the original critical habitat for both the endangered BNLL and its hybrid form on private lands.

The destructive allowed use by the forest service of ORV's in Ballinger Canyon on National Forest Service System and adjacent/adjoining private lands, has virtually eliminated the majority of the critical habitat for the hybrid BNLL in Ballinger Canyon.

The breakdown of the soil mantle by ORV's has caused the desiccation and erosion by water and wind of the soft friable underlying soils. Thus the permeability and porosity of the soil is reduced, the growth of native annuals and herbaceous perennials is eliminated, along with the destruction of insect pupae and larvae, and the basic energy-fixation and transfer systems of the basic food web of this semi-desert are disrupted. The injury to one link of this involved, intricate and little understood web, beginning with the arthropods, through the lizard, small mammals, small birds and the larger carnivores, becomes broken and thus weakens the entire system.

Insects and other arthropods are important in the pollination of plants as well as in conditioning desert soils. The rains that cause the flowers to bloom also induce the emergence of insects from their cocoons, pupae, and other dormant stages. Moths pollinate morning glories, columbines and yuccas; butterflies pollinate paintbrushes, fiddlenecks, larkspurs, legumes and penstemons. These insects are in turn, food for lizards, snakes, rodents, birds and carnivores. There are 45 mammals, 21 reptiles and 73 birds that inhabit this area within Ballinger Canyon.

The direct and indirect effects on the ecology of this critical habitat for the BNLL and its hybrid form by ORV's, has resulted in the loss of soil microbes and other microfauna due to damage to soils, noise, crushed dens and animals, loss of insect fauna, damage to vegetation, shrubs and nesting birds, shrub-associated reptiles, erosion, compaction, loss of seed bank, loss of ephemeral bloom, and loss of forage and perennial shrubs.

The hybrid BNLL has a very short period of time when active to feed in order to complete the breeding cycle, gestation period, egg laying and storing enough body fat to carry it through the periods of hibernation and estivation.

When one considers the very short time this lizard is active after emerging from hibernation, and restricted to a narrow regime of daytime air and soil temperatures, plus the inactive period of estivation due to above normal air and soil temperatures during the hot summer months. It becomes paramount and vital that any activity which disrupts this life cycle, be avoided in order for the survival of this species in a very hostile and fragile environment.

NOTE: The photographs submitted for this paper were unreproducible.