AT THE CROSSROADS

AT THE CROSSROADS 1974

A Report on

CALIFORNIA'S ENDANGERED AND RARE FISH AND WILDLIFE

January 1974

STATE OF CALIFORNIA

Ronald Reagan, Governor

THE RESOURCES AGENCY

N. B. Livermore, Jr., Secretary for Resources

FISH AND GAME COMMISSION

Sherman Chickering ..... San Francisco
Joseph Russ III ..... Ferndale
C. Ransom Pearman ..... Huntington Park
Peter T. Fletcher ..... Rancho Santa Fe
Timothy M. Doheny ..... Los Angeles

DEPARTMENT OF FISH AND GAME

G. Ray Arnett, Director

"Within a century our state's emblem -- the California grizzly bear -- once exceptionally abundant, has joined the ranks of vanished animals."

...Tracy I. Storer

STATE OF CALIFORNIA—RESOURCES AGENCY RONALD REAGAN, Governor

DEPARTMENT OF FISH AND GAME
.6 NINTH STREET
SACRAMENTO, CALIFORNIA 95814
G. Ray Arnett, Director

Honorable Ronald Reagan, Governor
State of California
Sacramento, California 95814

It is a pleasure, Governor Reagan---

---to transmit to you our second biennial report on the status of California's rare and endangered fish and wildlife.

This account of California's threatened fauna and our recommendations for actions needed to assure their continued survival is submitted pursuant to the provisions of the California Species Preservation Act of 1970.

Our first report, rendered on January 1, 1972, listed 43 species of vertebrates that were either rare or endangered. Subsequent surveys have revealed that six additional species meet the requirements for classification as rare or endangered. In accordance with the authority given it by the Endangered Species Act of 1970, the Fish and Game Commission, at its meeting of December 7, 1973, has added these to the State's official list.

Because of widespread public concern and support, much has been accomplished in the past two years to gain protection for these threatened species. Such accomplishments are reflected in the accounts contained herein. However, much yet remains to be done to guarantee their permanent protection and, hopefully, their eventual removal from endangerment. We remain committed to this goal.

Sincerely,

Director

FOREWORD

In 1970, the California legislature required the Department of Fish and Game to prepare biennial reports on the status of rare and endangered species of native fish and wildlife. Our first report, submitted on January 1, 1972, listed 43 species of fish, amphibians, reptiles, birds, and mammals threatened with extinction from one or more of a variety of causes, including loss or alteration of habitat, overexploitation, predation and competition, or hybridization.

Since then additional species have been inventoried and, regrettably, we find that six new forms will appear in this report. While even this revised account may not be all-inclusive, it does, we believe, reflect as accurately as possible the current status of those species for which adequate knowledge is available.

In our first report, we spoke of California's endangered animals, knowing full well that what we were truly addressing ourselves to was the urgent need to preserve on this earth, for all times, the identity of plant and animal communities in which these animals evolved and are but a small part. The factor contributing the most heavily to the demise of nearly all of the life forms herein listed is the loss or alteration of habitat associated with such things as urbanization, agriculture, flood control, and water development. Enactment of the Environmental Protection Program Act in 1970, among other things, provided the state with a source of revenue from the sale of personalized license plates, which has been made available in part to the Department of Fish and Game for the purchase of parcels of habitat critical to the survival of native species. Use of these funds has already been undertaken on behalf of several rare and endangered species and is planned for several more in coming years. It may also prove to be a source of funds to help carry on needed research and management programs. Lands acquired in the above manner usually are placed in the Department's Ecological Reserve system by the Fish and Game Commission, to be managed specifically for the benefit of rare and endangered species.

We again have relied on the expert advice of many scientists, too numerous to mention individually, in compiling much of the information contained in the following accounts. Whatever shortcomings may exist in the final product, however, must be our responsibility.

Howard R. Leach (Birds and Mammals)
Wildlife Management Branch

John M. Brode (Amphibians and Reptiles)
Inland Fisheries Branch

Stephen J. Nicola (Fishes)
Inland Fisheries Branch

Department of Fish and Game
Sacramento, California

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At the Crossroads

The 20th Century has experienced a powerful and efficient technology that is leading to exploitation of the world's resources and alteration of man's natural environment beyond comprehension.

In the past few years, California has surpassed all other 49 states in human population and technological growth. Its declining resource wealth and endangered fish and wildlife have only lately come to the attention of the general public. Unfortunately, unrecoreded has been the destruction and continuing disruption and disappearance of plant and animal communities.

To be sure, the public is knowledgeable of the extinction of the California grizzly bear, but little has been said of the loss of inconspicuous forms of wildlife or unique natural areas of ecological importance.

Why then are we concerned that progressive developments before us threaten forms of life which are known but to a few scientists and informed people? For example, the Owens pupfish. What does it contribute, and is the earth any better off if it is preserved? Who cares about the processes that set this little animal apart from all others, and what life form, if any, follows once this animal becomes extinct? The specter of continual extermination of plant and animal life is ever before us, and knowledge that this can lead to further impoverishment of the earth is disturbing.

Joshua Lederberg sums it up: "The variety of species is a great library of information, literally encoded in the specific DNA molecules that characterize each type. It is paradoxical that, in this era of most rapid elimination of natural variety, we have begun to learn the keys to that code and to appreciate the subtleties of the evolutionary mechanism that it drives. Each different species is a unique adaptation to its own way of life, a lesson in 'how to live' that we never properly understand after we extinguish it."

A collapsed California brown pelican egg...Franklin Gress

"When we try to pick up anything by itself we
find it attached to everything in the universe."

...John Muir

The DFG Recommends

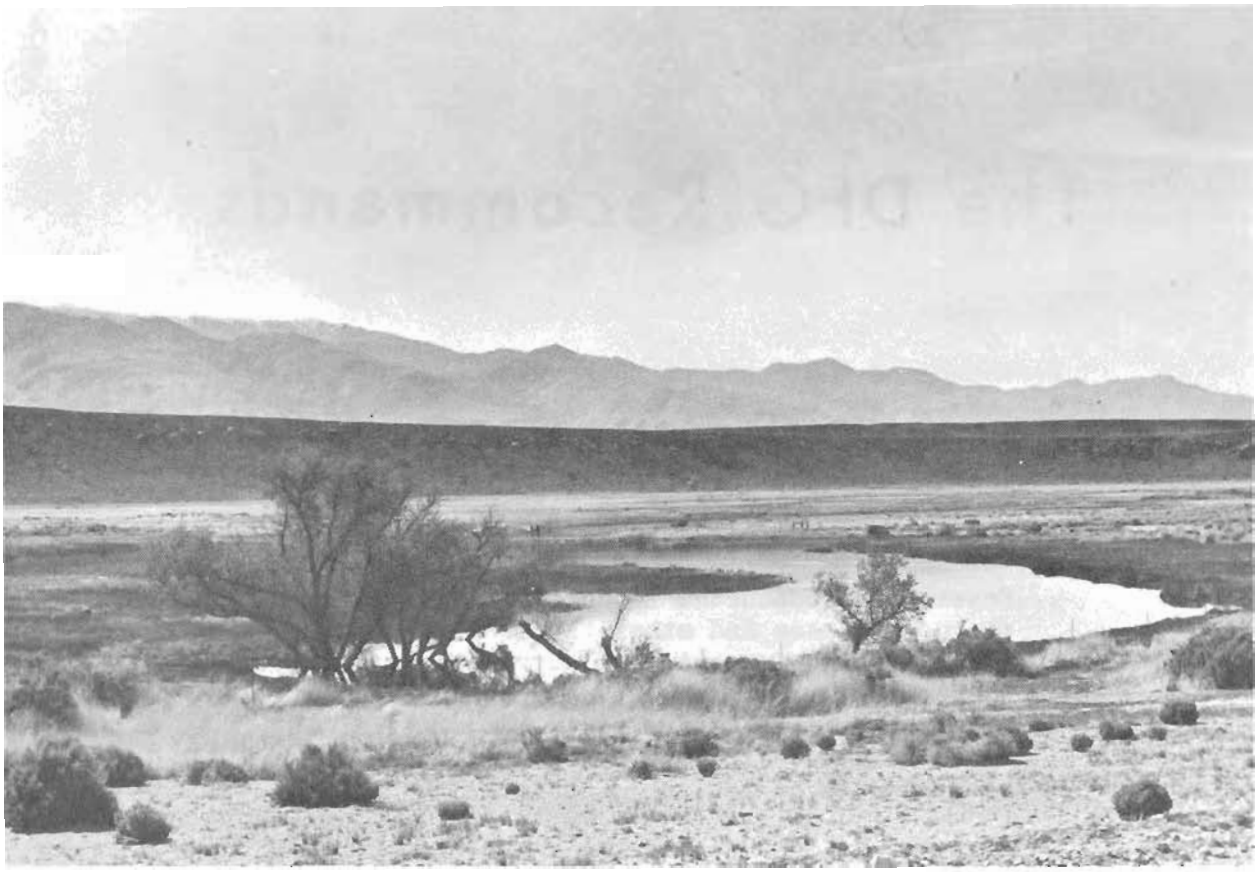
Assurance of the continuous survival of California's endangered and rare fish and wildlife requires that:

...Public funds be provided to share in the burden of preserving and managing fish and wildlife not hunted or commercially utilized.

...Research be conducted to determine the current status of these and other threatened animals and their requirements for survival.

...Critical habitat essential to the survival of these animals be placed under public stewardship or protected by law.

...Programs for the protection and management of each species be developed and implemented immediately.



Owens Valley Native Fishes Sanctuary, a unit of the Ecological Reserve System

"A land ethic of course cannot prevent the alteration, management and use of these 'resource,' but it does affirm their right to continue existence, and, at least in spots, their continued existence in a natural state."

...Aldo Leopold

Milestones

INTERNATIONAL

1966 International Union for Conservation of Nature, Morges, Switzerland, publishes a list of worldwide species it considers to be rare or endangered.

NATIONAL

1966 Endangered Species Preservation Act gives authority to the Secretary of the Interior to publish a list of native animals threatened with extinction and to provide federal programs of research and protection.

1969 Endangered Species Conservation Act extends to the Secretary of the Interior authority to deem endangered those worldwide animals faced with extinction and to prohibit their importation into the United States without permit.

STATE

1968 Ecological Reserve Act, established for the purpose of protecting rare or endangered wildlife or aquatic organisms or specialized habitat types, gives authority to the Department of Fish and Game to acquire by purchase, lease, gift, or otherwise land and water to be set aside as Ecological Reserves.

1970 California Species Preservation Act directs the California Department of Fish and Game to inventory all threatened fish and wildlife, develop criteria for rare and endangered, and report to the Governor and the Legislature every two years on the status of these animals.

1970 Endangered Species Act expresses legislative concern over California's threatened wildlife, defines rare and endangered wildlife, and gives authority to the Fish and Game Commission to deem what animals in California are rare and endangered.

1970 Assembly Joint Resolution 31 memorializes the President, Congress, and the Secretary of the Interior to assist the California Department of Fish and Game to compile a species inventory of threatened fish and wildlife of the State, to establish a set of criteria for determining rare and endangered species and to assist in a study of predatory control programs.

1970 Prohibition Against Importation of Endangered Wildlife. Penal Code Sections 6530o and 653p prohibit importation for commercial purposes and the selling of specified animals, including those listed by the Secretary of the Interior as endangered.

1970 Environmental Protection and Research Act creates an Environmental Protection Program Fund by authorizing the expenditure of funds from the sale of personalized license plates for environmental protection projects.

"When the last individual of a race of living things breathes no more, another Heaven and another Earth must pass before such a one can be again."

...William Beebe

FISH AND GAME COMMISSION ACTION

AFTER PROCEEDINGS HAD IN ACCORDANCE WITH THE PROVISIONS OF THE ADMINISTRATIVE PROCEDURE ACT (Gov. Code, Title 2, Div. 3, Part 1, Chapter 4.5) AND PURSUANT TO THE AUTHORITY VESTED BY SECTIONS 2050-2055 OF THE FISH AND GAME CODE, AND TO IMPLEMENT, INTERPRET, OR MAKE SPECIFIC SECTIONS 2050-2055 OF THE FISH AND GAME CODE, THE FISH AND GAME COMMISSION HEREBY ADDS TO SECTION 670.5 IN TITLE 14, CALIFORNIA ADMINISTRATIVE CODE, AS FOLLOWS:

(a) Endangered:

(1) Birds:

Belding's savannah sparrow (Passerculus sandwichensis beldingi)

(3) Fishes:

Thicktail chub (Gila crassicauda)
Owens tui chub (Gila bicolor snyderi)

(b) Rare:

(3) Fishes:

Modoc sucker (Catostomus microps)
Rough sculpin (Cottus asperrimus)
Cottonball Marsh pupfish (Cyprinodon milleri)

FURTHER, IT AMENDS SECTION 670.5 IN TITIE 14, CALIFORNIA ADMINISTRATIVE CODE BY CHANGING THE STATUS OF THE FOLLOWING FROM RARE TO ENDANGERED:

(a) Endangered:

(3) Fishes:

Bonytail (Gila elegans)
Humpback sucker (Xyrauchen texanus)
Shortnose sucker (Chasmistes brevirostris)
Lost River sucker (Catostomus luxatus)

THIS ORDER SHALL TAKE EFFECT ON THE THIRTIETH DAY AFTER FILING WITH THE SECRETARY OF STATE AS PROVIDED IN SECTION 11422 OF THE GOVERNMENT CODE.

PASSED UNANIMOUSLY.

FISH AND GAME COMMISSION
(Agency)

Date of adoption, amendment, or repeal:

Dec. 7, 1973

By: Leslie F. Edgerton
Leslie F. Edgerton
Executive Secretary
(Title)

Our Endangered Wildlife

The animals on the following pages are declared endangered by the California Fish and Game Commission because their continued existence is threatened by one or more conditions. If the answer is "yes" to any of the following questions, the species (or subspecies) under consideration is declared endangered:

...Does the mortality rate consistently exceed the birth rate?

...Is it incapable of adapting to environmental change?

...Is its habitat threatened by destruction or serious disturbance?

...Is its survival threatened by the unwanted introduction of other species through predation, competition, or disease?

...Does environmental pollution threaten its survival?

MORRO BAY KANGAROO RAT (*Dipodomys heermanni morroensis*) ENDANGERED

DESCRIPTION: This long-tailed rat with large hind and small front feet is the darkest of all kangaroo rats. The white hip stripe distinguishes it from other subspecies.

DISTRIBUTION: In 1957 it was reported to occur only within 12.4 km^2 (4.8 mi^2) of sandy soil on the south side of Morro Bay. Its range is now 4.4 km^2 (1.7 mi^2).

STATUS: Endangered. Continual growth of Los Osos and Baywood communities, reduction in escape cover, and predation by house cats threaten continued survival. The total population of this subspecies now numbers approximately 3,000.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Montana De Oro State Park boundary extended to shark inlet by Department of Parks and Recreation.

... Dune buggy and other vehicular traffic in habitat area prohibited.

... Habitat evaluation study completed by Department of Fish and Game in 1973.

RECOMMENDATIONS:

... Acquire and establish as an ecological reserve critical habitat adjacent to Montana De Oro State Park.

... Classify as a Nature Preserve lands within the State Park System inhabited by this endangered species.

... Initiate a management program to aid in protection and enhancement of habitat for the Morro Bay kangaroo rat.

REFERENCES:

Congdon, J. D. 1971. Population estimate and distribution of the Morro Bay kangaroo rat. Calif. Dept. Fish Game Wildl. Mgmt. Admin. Rep. 71-11. 16 pp.

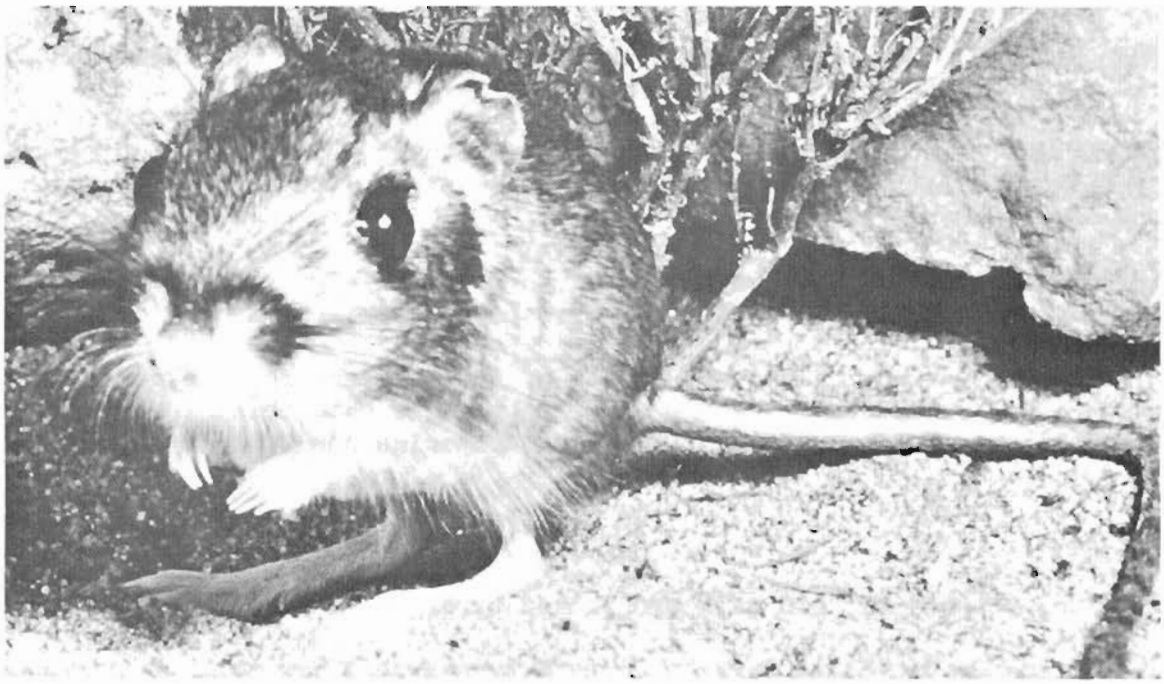
Grinnell, J. 1922. A geographical study of the kangaroo rats of California. Univ. Calif. Publ. Zool. 24(1):1-124.

Roest, A. 1973. Morro Bay kangaroo rat habitat evaluation study. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. W-54-R. 25 pp.

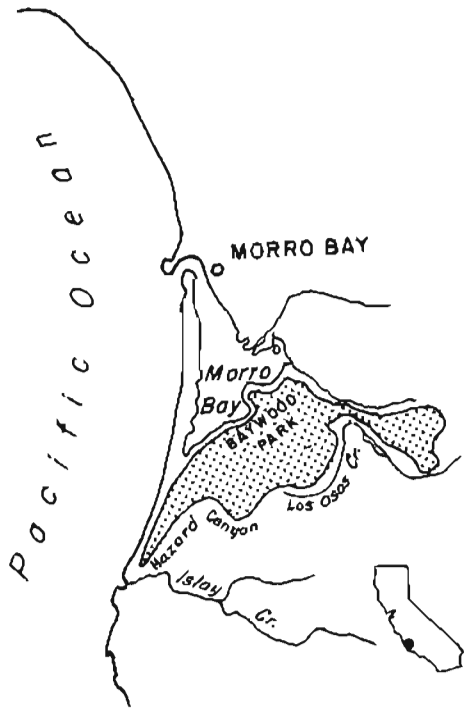
Stewart, G. R., and A. I. Roest. 1960. Distribution and habits of kangaroo rats at Morro Bay. J. Mammal. 41(1):126-129.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Morro Bay Kangaroo Rat



Glenn Stewart



SALT MARSH HARVEST MOUSE (Reithrodontomys raviventris) ENDANGERED

DESCRIPTION: This unique mouse inhabits San Francisco Bay brackfish and salt marshes. Recognized by its rich brown back and cinnamon to whitish underparts. One of the few mammals able to drink salt water.

DISTRIBUTION: Formerly found throughout the extensive marshes once bordering San Francisco Bay. Now restricted to scattered colonies within its original range.

STATUS: Endangered. Continual destruction of salt marsh habitat by bay fill and diking are major factors contributing to decline of the salt marsh harvest mouse.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Acquisition of Tubbs Island, North San Francisco Bay, and Knapp Gun Club, South San Francisco Bay, by The Nature Conservancy.

... Preservation of Palo Alto Marsh by City of Palo Alto.

... Portions of Grecko Island and Mowry Slough, South San Francisco Bay, established as a sanctuary by the Audubon Society.

... South San Francisco Bay and San Pablo Bay National Wildlife Refuge established by Congress.

... Bair Island acquired by the state.

... Bay fill proposals subject to approval by the Bay Conservation and Development Commission.

RECOMMENDATIONS:

... Initiate a study of the biology and habitat requirements of this species for the purpose of preparing and implementing a recovery plan designed to remove it from the endangered list.

... Preserve habitat areas critical to salt marsh harvest mouse survival through acquisition, easement, or memorandum of understanding with landowners.

REFERENCES:

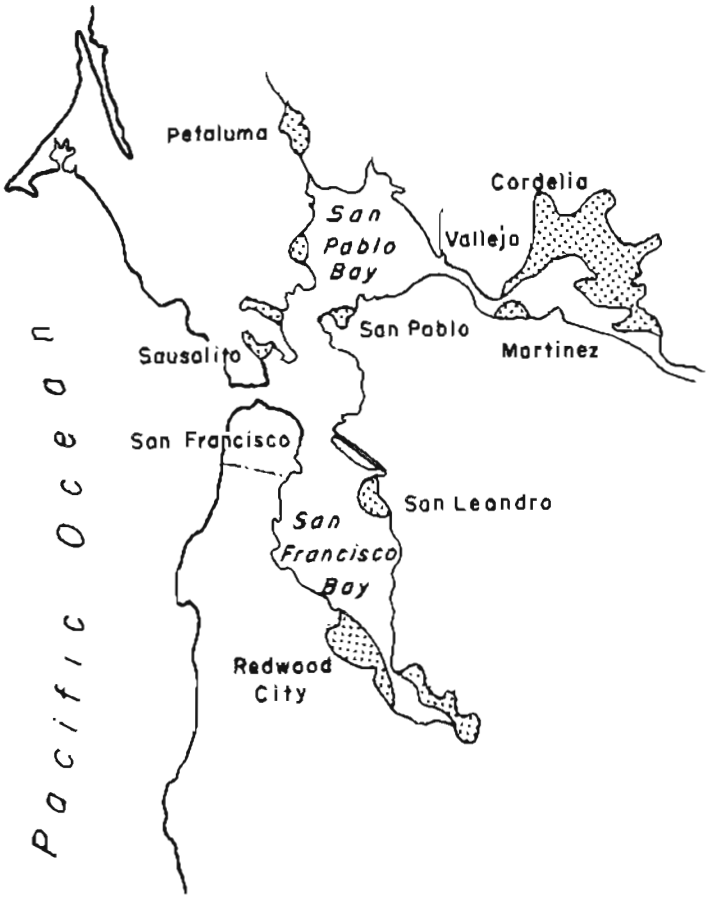
Fisler, G. F. 1965. Adaptations and speciation in harvest mice of the marshes of San Francisco Bay. Univ. Calif. Publ. Zool. 77(1):1-108.

Schaub, D.F. 1971. Salt marsh harvest mouse survey, 1971. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rept. W-54-R. 56 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Salt Marsh Harvest Mouse

Walt Luke



Birds . . .

CALIFORNIA CONDOR (*Gymnogyps californianus*) ENDANGERED

DESCRIPTION: This is a huge black vulture with white underwing patch and bare orange head. It is North America's largest land bird, having a wingspan of over 2.7 m (9 ft).

DISTRIBUTION: A relict of the Ice Age, the California condor once ranged over much of western North America from British Columbia to lower California. Its numbers are now reduced to slightly more than 50 birds confined largely to the rugged mountains of Ventura and Santa Barbara counties. Recent reports of a California condor in Baja California require further confirmation. One bird is in captivity at the Los Angeles Zoo.

STATUS: Endangered. Population is declining because of low recruitment of young, habitat loss, and human disturbance. Condors do not breed until 5-6 years old, females lay but one egg every two years, and incubation and brooding require six months. Nesting apparently is now confined to the Coast Range Mountains in San Luis Obispo, Ventura and Santa Barbara counties.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Sespe and Sisquoc Condor Sanctuaries set aside to protect roosting and nesting sites.

... Buffer zone around roosting and nesting sites established to lessen human disturbance.

... Moratorium set on new oil and gas leasing within Sespe Condor Sanctuary.

... Information programs developed to acquaint the public with the condor and its needs for survival.

... Hi Mountain condor nest site acquired by The Nature Conservancy and placed under U. S. Forest Service protection.

... State pursuing acquisition of Coldwater Canyon and San Cayento Mountain inholdings in Sespe Condor Sanctuary for ecological reserves for the California condor.

... A California Condor Recovery Team established to provide programs to restore the condor to the nonendangered status.

RECOMMENDATIONS:

... Afford added protection to the condor in the Sespe Condor Sanctuary and other lands critical to condor survival through U. S. Forest Service administrative policy governing public access.

... Acquire for public ownership the private lands within the Sespe Condor Sanctuary.

... Develop and implement a recovery plan designed to assure permanent protection for the California condor.

... Undertake a cooperative study with Mexico to determine condor abundance and distribution in lower California.

REFERENCES:

Carrier, D. 1971. Habitat management plan for the California condor. U. S. Forest Service, Dep. of Agr., San Francisco, Calif. 51 pp.

Koford, C. D. 1953. The California condor. Nat. Audubon Soc. Res. Rep. 4. 154 pp.

Mallette, R. D. 1970. Operational management plan for California condor. Calif. Dep. Fish and Game, Sacramento, Calif. 59 pp.

_____ 1971. Results of the California condor baiting effort, 1967-1969. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 71-6. 8 pp.

_____, Fred C. Sibley, W. Dean Carrier, and John C. Borneman. 1970. California condor survey, 1969. Calif. Fish Game 56(3):199-202.

_____, Sanford Wilbur, W. Dean Carrier, and John C. Borneman. 1972. California condor survey, 1970. Calif. Fish Game 58(1):67-68.

Miller, A. H., I. I. McMillan, and E. McMillan. 1965. The status and welfare of the California condor. Nat. Audubon Soc. Res. Rep. 6. 61 pp.

Sibley, F. C. 1968. Progress report: the life history, ecology and management of the California condor. Office of Endangered Species, Bur. of Sport Fisheries and Wildlife, Dep. of the Interior, Washington, D.C. 34 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Res. Publ. 114. 289 pp.

Wilbur, S. R. 1972. Food resources of the California condor. Bur. of Sport Fisheries and Wildlife, Dep. of the Interior, Ojai, Calif. 18 pp.

_____, W. D. Carrier, J. C. Borneman, and R. D. Mallette. 1972. Distribution and numbers of the California condor 1966-1971. Amer. Birds 26(33):819-823.

John Borneman

AMERICAN PEREGRINE FALCON (*Falco peregrinus anatum*) ENDANGERED

DESCRIPTION: Commonly called the duck hawk, this is a medium sized blue-gray hawk with long pointed wings. It is distinguished from other falcons by its black cap and black cheek patches. The prairie falcon is much browner and has a streaked breast.

DISTRIBUTION: The American peregrine--extinct as a breeding bird east of the Rocky Mountains--breeds in California along the coast, on the Channel Islands, and in higher mountains inland.

STATUS: Endangered. Mortality exceeds recruitment. Food chain contamination by persistent pesticides and other contaminants, illegal taking by falconers, human disturbance, and occasional shooting are contributing to its decline. In the 1940s the breeding bird population was 100 pairs; in 1970 this population had declined to 10 birds, of which 2 pairs produced 4 young. The numbers of this subspecies in captivity are not known.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Importation, transportation, and possession of all hawks and owls, without permit from the Department of Fish and Game, prohibited by state law.

... All peregrine and prairie falcons in captivity in California must be registered and identified by a nonremovable numbered leg band.

... Surveillance of known active nest sites is maintained during incubation and brooding of young.

... Environmental Protection Agency banned most use of DDT in the United States in December 1972.

... Morro Rock Ecological Reserve for the peregrine falcon established by the California Fish and Game Commission.

... Captive raptor breeding projects authorized by California Fish and Game Commission.

RECOMMENDATIONS:

... Direct conservation education efforts to better acquaint the public with the plight of the American peregrine and the added protection needed to assure survival.

... Protect active nest sites through acquisition, easement, or memorandum of understanding with landowners.

... Establish a program to reintroduce the American peregrine falcon at historical nest sites through release of propagated birds.

REFERENCES:

Herman, S. G. 1970. The peregrine falcon - a vanishing Californian. Outdoor California 31(1-2):10-14.

_____, 1971. The peregrine falcon decline in California. 2. Breeding status in 1970. Calif. Dep. Fish Game Spec. Wildl. Invest. Compl. Rep. 4 pp.

_____, M. N. Kirven, and R. W. Risebrough. 1970. The peregrine falcon decline in California. 1. A preliminary review. Audubon Field Notes 24(4):609-613.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Kenneth Fink

SOUTHERN BALD EAGLE (*Haliaeetus leucocephalus leucocephalus*) ENDANGERED

DESCRIPTION: This is a large soaring bird; brownish black with white head and tail and yellow hooked beak and talons. Immature birds lack white plummage until third or fourth year and are difficult to distinguish from the golden eagle.

DISTRIBUTION: This is the only eagle restricted to North America. Occurs statewide, particularly along the coast and in interior California about large lakes, reservoirs, and wetlands. Nests in vicinity of large lakes and reservoirs from Fresno County north.

STATUS: Endangered. Historically, bald eagles nested in abundance on the Channel Islands and along the coast; present nesting is limited to the Sierra Nevada, Cascade, and Klamath mountains. Thirty one territories were occupied in California in 1973, when 19 pairs produced 24 young. An influx of northern birds is evident in winter months. Reasons for its decline include irresponsible shooting, removal of nest trees, human encroachment into nesting and feeding areas, power line electrocution, environmental pollution, and contamination of the food chain by persistent pesticides.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Amended Bald Eagle Protection Act extends federal jurisdiction over all North American eagles, and establishes a maximum penalty of $5,000 and 1 year imprisonment for persons convicted of killing an eagle.

... U. S. Forest Service, Bureau of Sport Fisheries and Wildlife, and private lumber interests have taken action to protect nest trees and nesting eagles.

... "Blanket permits" to kill golden eagles halted by the Secretary of the Interior.

... Conservation agencies and private and public utilities are coordinating efforts to minimize accidental power line electrocution of eagles.

RECOMMENDATIONS:

... Protect from human intrusion during the nesting season all known bald eagle nests.

... Withdraw from sale public lands of importance as nesting sites, and classify these areas for uses that will protect nesting eagles.

... Protect nest sites on private lands through acquisition, easement, or memorandum of understanding with landowners.

... Increase public education programs to reduce illegal shooting.

SOUTHERN BALD EAGLE (continued)

... Undertake studies to more fully ascertain the degree of pesticide contamination in the bald eagle and its effects on reproduction.

REFERENCES:

Mallette, R. D. 1972. Raptor Survey. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. 18 pp.

Robbins, C. S. 1960. Status of the bald eagle summer of 1959. U. S. Fish Wildl. Serv. Leaflet 418. 8 pp.

Sprunt, A., and F. J. Ligas. 1966. Audubon bald eagle studies 1960-66 Proc. 62nd Ann. Conv. Nat. Audubon Soc.:25-30.

Thelander, C. G. 1973. Bald eagle reproduction in California, 1972-73. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 73-5. 16 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Karl M. Kenyon

CALIFORNIA BROWN PELICAN (Pelecanus occidentalis californicus) ENDANGERED

DESCRIPTION: This is a large grayish-brown coastal bird with a long, pouched bill. It flies with its neck and head folded back on the shoulders, and with alternate wing flapping and sailing. Adults have white heads and necks, whereas immatures are dark-headed.

DISTRIBUTION: This subspecies occurs on the Pacific Coast from Canada to Mexico. It nests on California's Channel Islands, and on the coastal islands off Lower California, and in the Gulf of California.

STATUS: Endangered. A 1972 survey indicated that the total population approximates 100,000 birds with 20,000 pelicans frequenting California's coast from August through November. California's only remaining nesting colony on Anacapa Island, numbering 300 pairs, is currently incapable of maintaining itself. Reproductive failure is due to collapse of thinshelled eggs during incubation, attributed to the effects of pollutants on breeding birds. In 1971 only 7 young were produced in 600 nesting attempts. Encouragingly, reproduction in 1972 and 1973 were 57 and 34 young respectively. A portion of the Anacapa Island colony nested on an islet adjacent to Santa Cruz Island in 1972.

ACTIONS:

... Public access to West Anacapa Island is prohibited during the nesting season.

... Anacapa Island breeding colony placed under surveillance by enforcement personnel and biologists of the Department of Fish and Game, U. S. Bureau of Sport Fisheries and Wildlife, and National Park Service.

... A 5-year study of the ecology of the California brown pelican initiated in 1971 by the Bureau of Sport Fisheries and Wildlife.

... Garden and household use of DDT prohibited in California in 1971.

... Agricultural use of DDT prohibited on all but four crops in California in 1971.

... Environmental Protection Agency bans most uses of DDT in United States in December 1972.

... Numerous studies have been initiated recently on the pollution of coastal waters and its effects on the biota.

RECOMMENDATIONS:

... Continue protection and surveillance of Anacapa Island nesting colony.

... Designate West Anacapa Island as a National Park Service Research Natural Area.

... Urge Federal Government to enter into a cooperative program with Mexico to protect nesting islands in Gulf of California and Pacific Ocean.

REFERENCES:

Anderson, D. W. and J. J. Hickey. 1970. Oological data on egg and breeding characteristics of brown pelicans. Wilson Bull. 82:14-28.

_____, J. O. Keith, R. E. White, K. A. King, and L. R. Deweese. 1972a. Field ecology investigations of two effects of selected pesticides on wildlife populations and brown pelicans--status of P.O. californicus. Bur. Sport Fish. Wildl. Denver Wildl. Res. Center Ann. Prog. Rep. 2. 39 pp.

_____. 1972b. Post-breeding dispersal of brown pelicans and other waterbirds into the Southwestern United States. Bur. Sport Fish. Wildl. Denver Wildl. Res. Center Ann. Prog. Rep. 3. 18 pp.

Blus, L. J., R. G. Heath, C. D. Gesh, A. A. Belisle, and R. M. Prouty. 1971. Eggshell thinning in the brown pelican: implication of DDE. Bio-Science 21(24):1213-1215.

Gress, F. 1970. Reproductive status of the California brown pelican in 1970 with notes on breeding biology and natural history. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 70-6. 21 pp.

Jehl, J. R., Jr. 1970. Is thirty million years long enough? Pac. Discovery 23:16-23.

Keith, J. O., L. A. Woods, Jr., and E. G. Hunt. 1970. Reproductive failure in brown pelicans on the Pacific Coast. Proc. 35th N. Amer. Wildl. Nat. Res. Conf. 15 pp.

Schreiber, R. W., and R. L. DeLong. 1969. Brown pelican status in California. Audubon Field Notes 23:57-59.

_____, and R. W. Risebrough. 1972. Studies of the brown pelican. I. Status of brown pelican populations in the United States. Wilson Bull. 84:119-135.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

California Brown Pelican

Daniel Anderson

CALIFORNIA LEAST TERN (*Sterna albifrons browni*) ENDANGERED

DESCRIPTION: Smallest of the terns, this sparrow-sized bird is easily recognized by its white body, black-tipped wings, and black-capped head. Its quick wing beats and hovering action separate it from the larger terns.

DISTRIBUTION: Summer visitor from April through September along the coastline from Mexico to San Francisco. Winters in southern hemisphere and breeds along the Pacific Coast from Lower California to San Francisco Bay.

STATUS: Endangered. Habitat destruction, disturbance and predation threaten this subspecies with extinction. Successful nesting requires sandy beaches free from human disturbance and vegetation. The U. S. Marine Corps has a program of protection and enhancement of this subspecies, and has demonstrated that measures can be taken to encourage least tern production: the Santa Margarita River colony at Camp Pendleton increased from 19 pairs in 1970 to 250 nesting pairs in 1973. In 1973, a total of 690 pairs nested in 20 sites located mostly on southern California beaches.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Huntington Beach State Park Tern Sanctuary established.

... Santa Margarita River Tern Sanctuary, and a program of protection and habitat manipulation have been established by the U. S. Marine Corps at Camp Pendleton.

... Buena Vista Lagoon Ecological Reserve established by the state.

... Seal Beach National Wildlife Refuge established by Congress.

... Bair Island in San Francisco Bay acquired by the state.

... A portion of Sunset Aquatic Park has been fenced by Orange County and set aside as a tern sanctuary.

... City of San Diego established a temporary least tern sanctuary on Mission Bay. Western Wildlife Unlimited, a local citizen's group, raised sufficient funds to fence this 8.1 ha (20 acre) nesting site to provide protection.

... Border Field State Park established on Barrier Beach near mouth of Tijuana River.

RECOMMENDATIONS:

... Initiate habitat development program in San Francisco Bay directed to protection of nesting sites on Bair Island and Bay Farm Island.

... Initiate a least tern habitat management plan in early 1974 at Sunset Aquatic Park.

... Locate and develop an alternate nesting site for the Huntington Harbor colony prior to the 1974 nesting season.

... Evaluate nesting sites in Mission Bay and direct efforts to setting aside those areas which can be most effectively protected and managed.

... Develop an alternate nesting site for the San Diego Airport colony.

... Protect other areas critical to the survival of the California least tern through acquisition, easement, or memorandum of understanding with landowners.

REFERENCES:

Bender, K. 1973. California least tern census and nesting survey, 1973. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. 47 pp.

Craig, A. M. 1973. Survey of California least tern nesting sites. Calif. Dep. Fish Game Spec. Wildl. Invest. Compl. Rep. 55 pp.

Gill, R. E. 1972. South San Francisco Bay breeding bird survey, 1971. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 72-6. 68 pp.

Massey, B. W. 1971. A breeding study of the California least tern, 1971. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 71-9. 23 pp.

Pentis, A. 1972. Who will save the least tern? Environmental Southwest 446: 6-8.

Swickard, D. 1971. Terns displace tanks. Outdoor California 32(1-2):29.

_____. 1971. The status of the California least tern at Camp Pendleton, 1971. U. S. Marine Corps, Camp Pendleton, Calif. 30 pp.

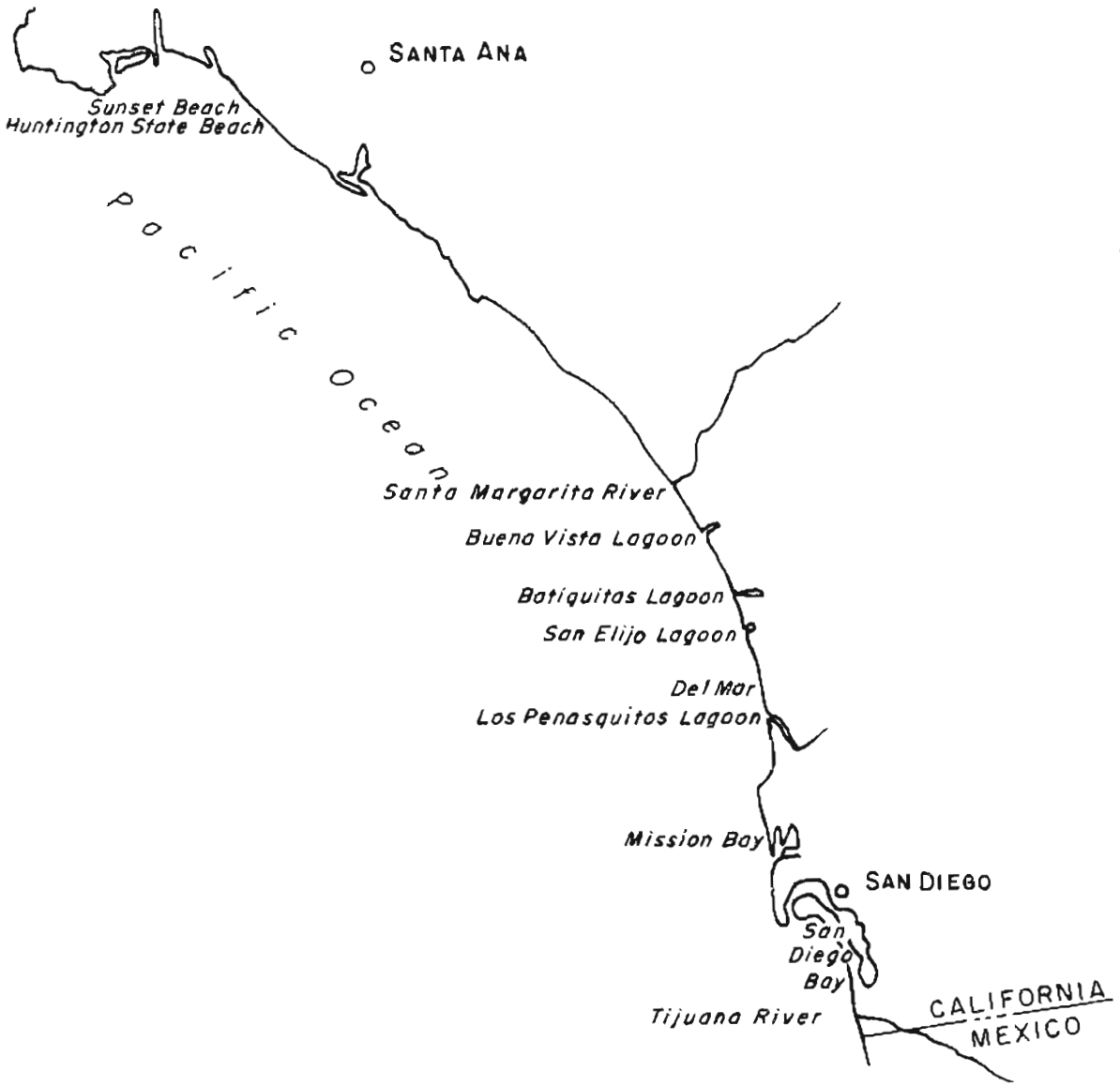
_____. 1972. Summary, 1972 least tern survey. U. S. Marine Corps, Camp Pendleton, Calif. 1 p.

_____. 1973. Summary, 1973 least tern nesting survey, U. S. Marine Corps, Camp Pendleton, Calif. 2 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Wilbur, S. R. 1973. The literature of the California least tern. Office of Endangered Species, Bur. Sport Fisheries and Wildlife, Dept. of the Interior, Washington, D.C. 27 pp.

California Least Tern



CALIFORNIA CLAPPER RAIL (Rallus longirostris obsoletus) ENDANGERED

DESCRIPTION: This is a hen-sized, long-billed, brown bird with tawny breast, barred flanks, and a short upturned tail with white beneath. Largest of California's rails, this secretive marsh bird is seldom seen far from salt marshes.

DISTRIBUTION: It is a resident in salt marshes of San Francisco Bay, San Pablo Bay, and Elkhorn Slough, and a casual visitor to Bolinas, Tomales, and Humboldt Bays.

STATUS: Endangered. This rail is highly specialized and apparently incapable of adapting to environmental change. Major populations occur in salt marshes bordering South San Francisco Bay, where they number 2,700 birds. Smaller populations exist in San Pablo Bay and Elkhorn Slough. They are absent from Suisun Bay and many other salt marshes along the north and central coast. Fill and drainage as well as industrial pollution and the introduced old-world rat were threatening their existence. However, with the recent establishment of the South San Francisco Bay National Wildlife Refuge and preservation of key habitat areas, there is opportunity now to develop management plans to remove this rail from endangerment.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Preservation of Palo Alto Marsh by City of Palo Alto.

... Acquisition of Tubbs Island, North San Francisco Bay, and Knapp Gun Club, South San Francisco Bay, by the Nature Conservancy.

... Portions of Grecko Island and Mowry Slough in South San Francisco Bay established as a sanctuary by the Audubon Society.

... South San Francisco Bay and San Pablo Bay National Wildlife Refuge established by Congress.

... Bair Island acquired by the state.

... Bay fill proposals subject to approval by the Bay Conservation and Development Commission.

RECOMMENDATIONS:

... Protect other salt marsh areas in San Francisco Bay critical to clapper rail survival through acquisition, easement, or memorandum of understanding with landowners.

... Acquire for public ownership Petaluma Marsh in San Pablo Bay.

... Instigate a program to establish breeding colonies in areas presently not occupied by the California clapper rail.

REFERENCES:

Gill, R. E. 1971. South San Francisco Bay breeding bird survey, 1971. Calif. Dep. Fish Game Wildl. Mgt. Admin. Rep. 72-6. 68 pp.

Gould, G. 1973. California clapper rail survey, 1973. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. 6 pp.

Milton, W. C. 1972. A breeding survey of the California clapper rail in the Emeryville Crescent. Dep. Nat. Res. Cons., Univ. Calif., Berkeley. 8 pp.

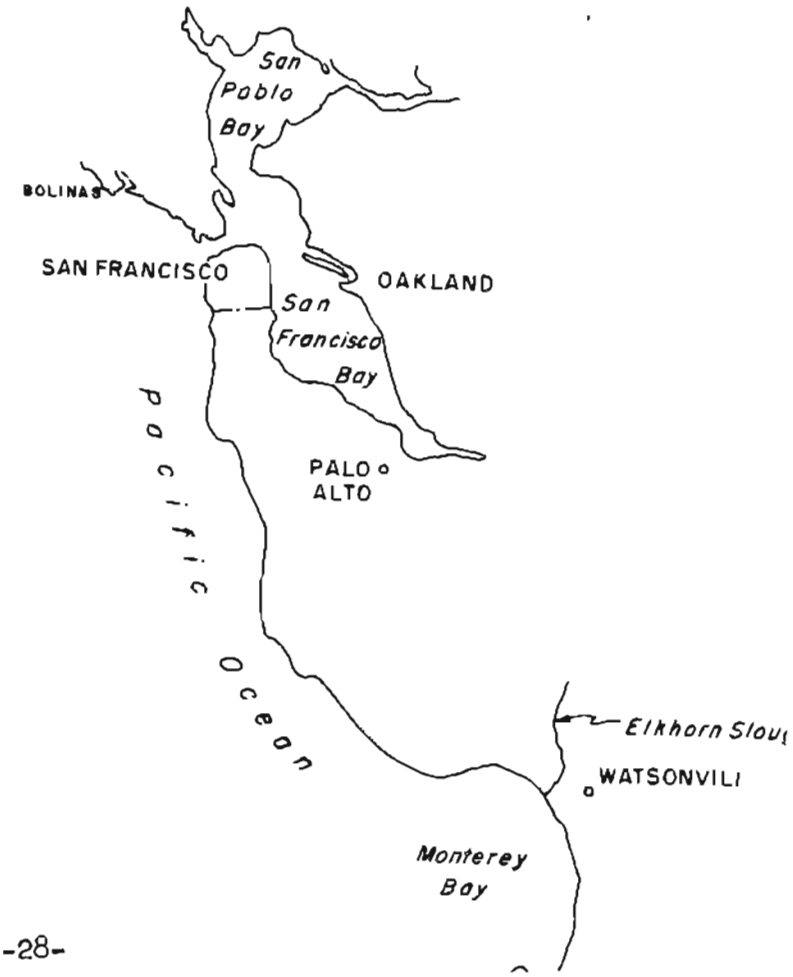
Oberholser, H. C. 1937. A revision of the clapper rails (Rallus longirostris broddaert). Proc. U. S. Nat. Mus. 84(3018):313-353.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Varoujean, D. H. 1972. A study of the California clapper rail in Elkhorn Slough. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. 11 pp.

Zucca, J. J. 1954. A study of the California clapper rail. Wasmann J. Biol. 12(2):135-153.

Bob Gill



YUMA CLAPPER RAIL (Rallus longirostris yumanensis) ENDANGERED

DESCRIPTION: This is the smallest of the clapper rails in California. It is the only clapper rail inhabiting freshwater marshes in Southeastern California from April to November.

DISTRIBUTION: This rail nests along the Colorado River from Gulf of California, Mexico, to Davis Dam above Needles, at Salton Sea, and Gila River, Arizona. It occurs mostly in areas of dense cattails and tules.

STATUS: Endangered. Channelization and phreatophyte removal along the Colorado River threaten its survival. Its numbers are believed to be in excess of 900 individuals along Colorado River. Thirty one birds have been found at the Salton Sea, principally on the Wister Wildlife Management Area.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... A Yuma Clapper Rail Recovery Team established to provide programs to restore the Yuma clapper rail to the nonendangered status.

... Extensive survey in 1973 of 515 km (320 mi) of Colorado River identified areas inhabited by clapper rails.

... A study of clapper rail biology and habitat requirements undertaken by the Department.

... A 3-year study by Arizona State University, funded by the U. S. Bureau of Reclamation, is documenting the important wildlife communities along the Colorado River from Davis Dam to Mexican border.

... Federal program of preservation and management of clapper rail habitat enacted for Havasu Lake and Imperial National Wildlife Refuges.

RECOMMENDATIONS:

... Develop and implement a recovery plan designed to achieve the measures necessary to remove this rail from its endangered status.

... Preserve areas critical to clapper rail survival in their natural state through acquisition, easement, or memorandum of understanding with landowners.

REFERENCES:

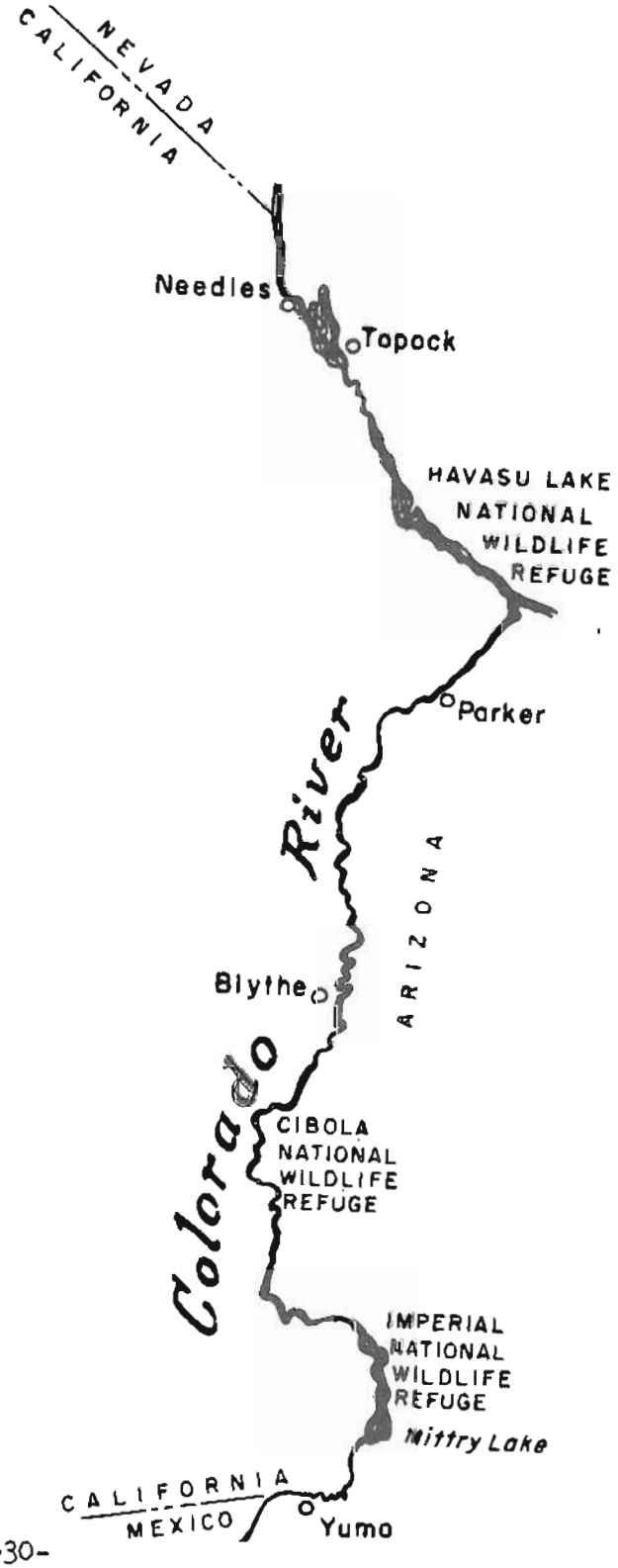
Oberholser, H. C. 1937. A revision of the clapper rails (Rallus longirostris broddaert). Proc. U. S. Nat. Mus. 84(3018):313-353.

Todd, R. L. 1969. Arizona Game and Fish Department Nongame Investigations, 1968-69. P-R W-53-R-1 Compl. Rep., April 1969. 25 pp.

Tomlinson, R. E. and R. L. Todd. 1973. Distribution of two western clapper rail races as determined by responses to taped calls. The Condor 34(2):177-183.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resources Publ. 114. 289 pp.

Bob Gill



LIGHT-FOOTED CLAPPER RAIL (Rallus longirostris levipes) ENDANGERED

DESCRIPTION: This subspecies is slightly smaller and darker than the California clapper rail. It is the only clapper rail found in southern California coastal salt marshes.

DISTRIBUTION: It ranges from Carpinteria south to San Quintin Bay, Lower California. Breeding colonies in California apparently are limited to Carpinteria Marsh, Anaheim Bay, Upper Newport Bay, Los Penasquitos Lagoon, Tijuana River Marsh, and remnant salt marshes in Mission and San Diego bays.

STATUS: Endangered. Planned developments of Tijuana River Marsh, South San Diego Bay, Upper Newport Bay, Los Penasquitos Lagoon, and other southern California coastal salt marshes threaten its survival. Only Tijuana River Marsh and Anaheim Bay support more than a few dozen rails.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Seal Beach National Wildlife Refuge at Anaheim Bay established by Congress, and a planned freeway route through the marsh has been abandoned.

... The California Coastal Zone Commission established in 1973 to regulate development along coast.

... Census of light-footed clapper rail being conducted by Bureau of Sport Fisheries and Wildlife.

RECOMMENDATIONS:

... Acquire for public ownership the Tijuana Estuary and Marsh.

... Establish Upper Newport Bay as an ecological reserve and refuge.

... Place Carpinteria Marsh in the Natural Land and Water Reserve System of the University of California.

REFERENCES:

Oberholser, H. C. 1937. A revision of the clapper rails (Rallus longirostris broddaert). Proc. U. S. Nat. Mus. 84(3018):313-353.

Sexton, C. W. 1972. Clapper rails at Upper Newport Bay, California. Dep. Pop. Envir. Biol., Univ. Calif., Irvine, Calif. 13 pp.

Speth, J. W. 1969. Status report on the coastal wetlands of Southern California as of February 1, 1969. Calif. Dep. Fish and Game, Sacramento, Calif. 29 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Young, R. 1973. Victim of progress: the light-footed clapper rail. Environmental Southwest 453:5-6.

Light Footed Clapper Rail

Herbert Clarke

BELDING'S SAVANNAH SPARROW (Passerculus sandwichensis beldingi) ENDANGERED

DESCRIPTION: This subspecies is distinguished from other savannah sparrows by its darker coloration, lack of distinct crown stripe, heavy streaking on throat, breast, and sides, and restricted distribution.

DISTRIBUTION: The Belding's savannah sparrow occurs as a resident in the tidal estuaries of southern California and lower California, Mexico. It is closely associated with the pickleweed habitat occupied by the endangered light-footed clapper rail. Surveys made in 1973 revealed that only 11 breeding sites exist from Santa Barbara to San Diego.

STATUS: Endangered. (New to list.) Planned developments of Tijuana River Marsh, Los Penasquitos Lagoon, and other southern California coastal salt marshes threaten its survival. The breeding population is about 1,100 pairs.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Seal Beach National Wildlife Refuge at Anaheim Bay established by Congress.

... California Coastal Zone Commission established in 1973 to regulate development along the coast.

RECOMMENDATIONS:

... Acquire for public ownership Tijuana Estuary and Marsh.

... Establish Upper Newport Bay as an ecological reserve.

... Place Carpinteria Marsh in the Natural Land and Water Reserve System of the University of California.

REFERENCES:

Bradley, R. A. 1973. A population census of the Belding's savannah sparrow. Western Bird Bander 48(3):40-43

Grinnell, J. and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27:485-488.

Belding's Savannah Sparrow

Reptiles . . .

BLUNT-NOSED LEOPARD LIZARD (Crotaphytus silus) ENDANGERED

DESCRIPTION: This is a robust lizard with a long, round tail. The head is large with a short, blunt snout. Color above is gray or brown, with whitish crossbars on back and tail. "Leopard" spots are present on back and tail. The throat is spotted with gray. Breeding females have a single row of orange or reddish spots on sides. Length from snout to vent in adults is 89-127 mm ($3\frac{1}{2}$-5 in).

DISTRIBUTION: This species was originally found throughout the San Joaquin Valley and adjacent foothills from about San Joaquin County southward and into eastern San Luis Obispo County. It now occurs in scattered locations in the valley, in the foothills of Tulare and Kern counties, and in the eastern portions of the Coast Range foothills and Carrizo Plain. It inhabits sparsely vegetated plains, alkali flats, low foothills, grasslands, canyon floors, large washes, and arroyos. It is absent or scarce in areas of heavy vegetation or tall grass.

STATUS: Endangered. Subdivisions, water control, and increasing agricultural use have eliminated many populations. The sparsely vegetated plains and grassland areas preferred by this animal are rapidly dwindling and will continue to do so with additional water being imported for agricultural purposes. Good habitat still remains on the Naval Petroleum Reserve near Taft, and on the Kern and Pixley National Wildlife refuges.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior and the International Union for Conservation of Nature and Natural Resources.

... The Department of Fish and Game has conducted preliminary surveys and has initiated cooperative studies with the University of California and several colleges to further determine the distribution and status of this lizard.

RECOMMENDATIONS:

... Continue surveys throughout the range of the blunt-nosed leopard lizard to determine the extent and status of existing populations.

... Protect remnants of the habitat on public lands, such as the Naval Petroleum Reserve near Taft, and on the Kern and Pixley National Wildlife Refuges.

... Preserve critical habitat on private lands through acquisition or agreement with landowner.

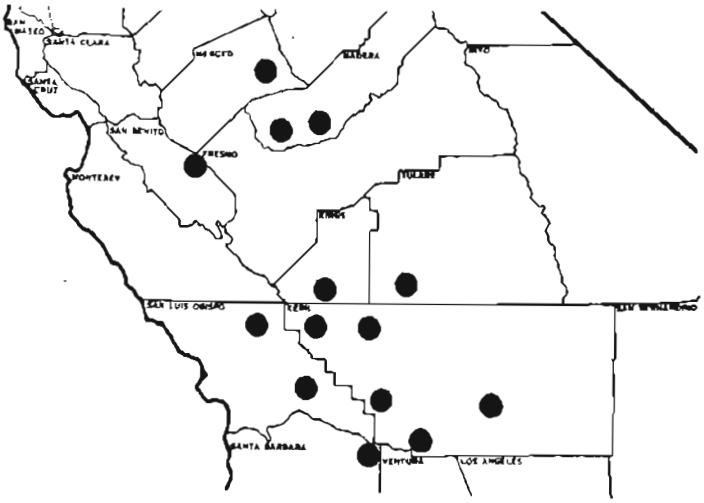
REFERENCES:

Montanucci, R. R. 1965. Observations on the San Joaquin leopard lizard, Crotaphytus wislizenii silus Stejneger. Herpetologica 21(4):270-283.

_____. 1970. Analysis of hybridization between Crotaphytus wislizenii and Crotaphytus silus (Sauria: Iguanidae) in California. Copeia 1970 (1):104-123.

Blunt Nosed Leopard Lizard

John M. Brode



SAN FRANCISCO GARTER SNAKE (Thamnophis sirtalis tetrataenia) ENDANGERED

DESCRIPTION: This is one of the most strikingly beautiful snakes of North America. The top of the head is red. There is a wide middorsal stripe of greenish-yellow edged with black, and broad red stripes on each side bordered with black. The red stripe may be broken or divided anywhere along the body. The ventral side is turquoise blue. Adult females grow to 122 cm (4 ft).

DISTRIBUTION: Occurs from northern San Mateo County southward along the east slope of the Santa Cruz Mountains to the Santa Clara County line, and along the Coast west of this region southward to Point Ano Nuevo. It is found most commonly in vegetation that borders ponds and lakes. Marshy areas with good cover are especially favored.

STATUS: Endangered. Fewer than 20 populations are currently known. Most populations are composed of less than 50 adults, and there is high mortality in newborn young. The snake was formerly abundant at a few ponds near Daly City, but housing construction has eliminated these populations. Less than 5% of the present habitat is on protected land.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior and the International Union for Conservation of Nature and Natural Resources.

... The San Francisco Water Department has been advised of the presence of this snake on the peninsular watershed, which includes the San Francisco State Fish and Game Refuge.

... The Department of Fish and Game is cooperating with the University of California at Davis in a study of the distribution and status of this snake. University biologists have bred this snake in captivity and have released young on the San Francisco Fish and Game Refuge.

RECOMMENDATIONS:

... Improve management practices on the San Francisco peninsular watershed to insure the snake's survival on these lands.

... Preserve critical habitat on private lands through acquisition or agreement with landowners.

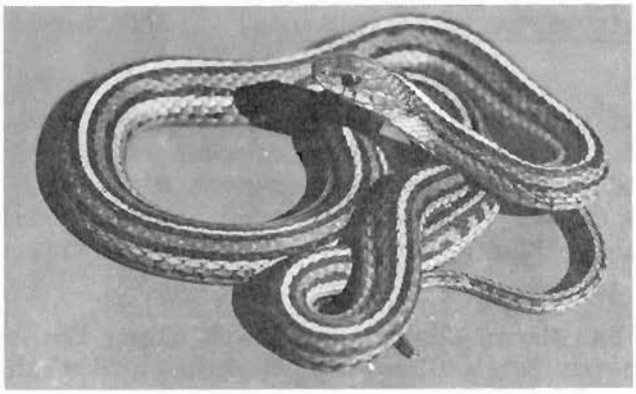
... Carefully plan any new construction in San Mateo County to avoid disturbing the remaining San Francisco garter snake habitat.

... Provide strict enforcement of protective laws to prevent collection of this snake.

REFERENCES:

Fox, W. 1951. The status of the garter snake, Thamnophis sirtalis tetrataenia. Copeia 1951 (4):257-267.

San Francisco Garter Snake



John M. Brode

Amphibians . . .

SANTA CRUZ LONG-TOED SALAMANDER ENDANGERED
(Ambystoma macrodactylum croceum)

DESCRIPTION: A small salamander with relatively long toes. Color is black above with irregular middorsal spots of metallic yellow-gold to orange. The ventral side is sooty. The teeth form a continuous or broken band across the roof of the mouth. Adults grow to about 127 mm (5 in).

DISTRIBUTION: Formerly known from only 2 locations in Santa Cruz County - Valencia Lagoon near Aptos and Ellicott Station 6.4 km (4 mi) northwest of Watsonville. Recently, a third locality has been discovered, in Monterey County, 1.6 km (1 mi) north of Moss Landing. This salamander is associated with temporary ponds in which it breeds in winter. During the dry months the salamanders take refuge in nearby oak and willow thickets.

STATUS: Endangered. The Valencia Lagoon habitat was drastically altered by freeway construction, and the habitat in Monterey County is threatened by agricultural development. The Ellicott Station location represents the only remaining undisturbed habitat for this salamander.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior and the International Union for Conservation of Nature and Natural Resources.

... An artificial, temporary breeding pond was constructed at Valencia Lagoon in 1970 by the Division of Highways.

... The Department of Fish and Game has purchased 18.6 ha (30 acres) of critical habitat at the Ellicott Station locality and the remaining undisturbed portion of Valencia Lagoon with funds from the Environmental Protection Program (personalized license plates).

... The Bureau of Sport Fisheries and Wildlife is planning to acquire additional habitat at both the Santa Cruz County localities.

RECOMMENDATIONS:

... Monitor populations at all localities to determine reproductive success and population size.

... Develop a plan with the California Division of Highways to rehabilitate Valencia Lagoon.

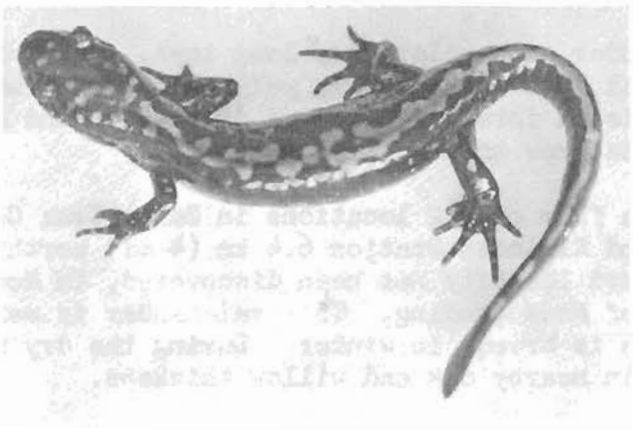
... Purchase additional terrestrial habitat critical to the survival of this salamander.

REFERENCES:

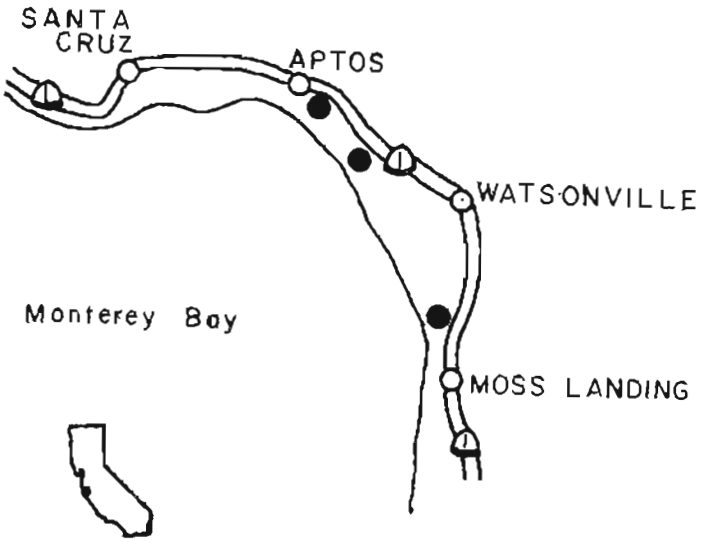
Ferguson, D. E. 1961. The geographic variation of Ambystoma macrodactylum Baird, with the description of two new subspecies. Amer. Midl. Nat. 65:311-338.

Russell, R. W. and J. E. Anderson. 1956. A disjunct population of the long-nosed (sic) salamander from the coast of California. Herpetologica 12:137-140.

Santa Cruz Long-Toed Salamander



John M. Brode



DESERT SLENDER SALAMANDER (Batrachoseps aridus) ENDANGERED

DESCRIPTION: This is a moderately small slender salamander with a short tail. There are 4 toes on all feet. Color is blackish maroon above, overlaid with an indistinct lighter band. Ventrally, the trunk is a darker blackish maroon and the underside of the tail is flesh colored. Adults grow to 102-114 mm (4-4½ in).

DISTRIBUTION: Known only from Hidden Palm Canyon, a tributary of Deep Canyon, about 16 km (10 mi) south of Palm Desert, Riverside County. It is found in crevices between limestone sheets and under limestone slabs and other rocks along the base of cliffs where continuous water seepage occurs.

STATUS: Endangered. This salamander, first discovered in 1969, is found in a very restricted area. The habitat could be destroyed very easily.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior, and by the International Union for Conservation of Nature and Natural Resources.

... The Department of Fish and Game has purchased the critical habitat of this salamander with funds from the Environmental Protection Program (personalized license plates), and is monitoring the population and habitat.

RECOMMENDATIONS:

... Fence the critical habitat to prevent damage.

... Search additional canyon areas for the possible existence of this species in other locations.

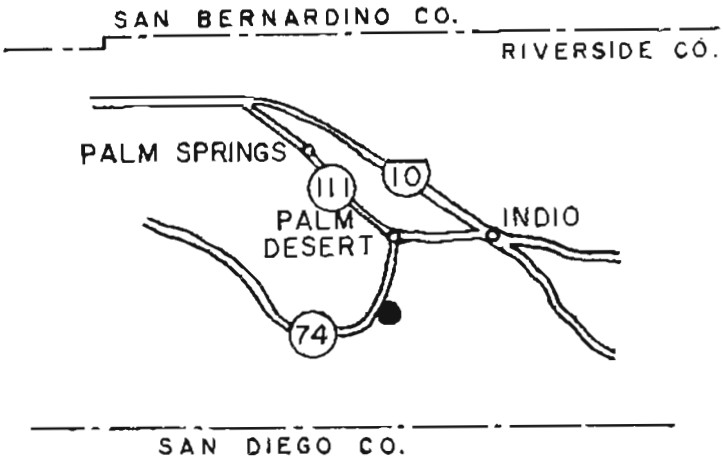
REFERENCES:

Boynton, K. L. 1971. A singular salamander. Desert 34(10):18-21.

Brame, A. H., Jr. 1970. A new species of Batrachoseps (slender salamander) from the desert of southern California. L. A. Co. Mus. Contri. Sci. 200:1-11.

Desert Slender Salamander

John M. Brode



fishes . . .

COLORADO SQUAWFISH (Ptychocheilus lucius) ENDANGERED

DESCRIPTION: This is a large, slender fish with a somewhat pike-like appearance. However, there are no teeth in the mouth. Coloration is dusky-greenish above, silvery on the sides, and yellowish to white on the belly. The head is long, slender, and depressed, with a large mouth and small eyes. The scales are small, with 80 to 90 in the lateral line, which is strongly decurved anteriorly. It is the largest of the American minnows, reportedly growing to 1.5 m (5 ft) and 36 kg (80 lb).

DISTRIBUTION: Originally abundant throughout the Colorado River and major tributaries in deeper water and strong currents, it is now present only in the upper drainage. It has not been seen below Glen Canyon Dam in northern Arizona since 1968.

STATUS: Endangered. May be extinct in California, since it has not been collected here since 1952. Extensive habitat alterations, including channelization, the construction of large reservoirs, flow reductions, and increasing salinity of the lower Colorado River, have probably been responsible for the decline in numbers. The critical factors in the habitat, except perhaps flowing water, are unknown.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior, and by the International Union for Conservation of Nature and Natural Resources.

... Interagency and interstate recovery team formed in 1973 to determine existence and status of population in lower Colorado River and to determine what measures are necessary for its survival and replenishment. The team is rearing a broodstock of squawfish in Willow Beach Federal Hatchery, Arizona for a planned restocking program for the lower river states.

RECOMMENDATIONS:

... Prevent further habitat alteration and destruction in the Colorado River.

REFERENCES:

Beland, Richard D. 1953. The effect of channelization on the fishery of the lower Colorado River. Calif. Fish Game 39(1):137-139.

Dill, William A. 1944. The fishery of the lower Colorado River. Calif. Fish Game 30(3):109-211.

La Rivers, I. 1962. Fishes and fisheries of Nevada. Nev. Fish and Game Comm., Reno, Nevada. 782 pp.

Winn, Howard Elliot, and Robert R. Miller. 1954. Native postlarval fishes of the lower Colorado River basin, with a key to their identification. Calif. Fish Game 40(3):273-285.

Colorado Squawfish

J. Bruce Kimsey

THICKTAIL CHUB (Gila crassicauda) ENDANGERED

DESCRIPTION: This is a stocky chub with a very deep and thick caudal peduncle. The head is short and cone-shaped. There is a pronounced hump in the dorsal outline just behind the head. Color is dark above, grading to silvery on the belly. The scales are large, with 49-60 in the lateral line.

DISTRIBUTION: This fish was formerly common in lowland waters of the Central Valley from near Redding southward to Bakersfield; it also occurred in Clear Lake and in Coyote Creek, tributary to south San Francisco Bay. It was the third most abundant native fish species in midden samples from an aboriginal fishing village in the lower Sacramento Valley.

STATUS: Endangered. (New to list.) This species had disappeared from Clear Lake by 1940. The last known specimen was collected in 1957 from Steamboat Slough in the Sacramento River Delta. It may be extinct now, since it has not been identified in extensive fish collections made throughout the Sacramento-San Joaquin Delta, and at the fish collection facilities of the Bureau of Reclamation and Department of Water Resources pumping plants. Draining of riparian marshes, together with diking, channelization, and other flood control measures are largely responsible for loss of habitat. Predation by exotic game fishes probably has contributed to decline, also.

ACTIONS:

... Take, possession, and sale prohibited by state law.

RECOMMENDATIONS:

... Survey completely the remaining Central Valley riparian marshes to determine if specimens can still be found. (A partial survey of Central Valley waters by the Department of Fish and Game is scheduled for completion in April 1974).

... Prevent further loss of riparian marshland.

... Allow riparian marshlands to flood in spring so that they may be utilized for spawning and as nursery areas.

REFERENCES:

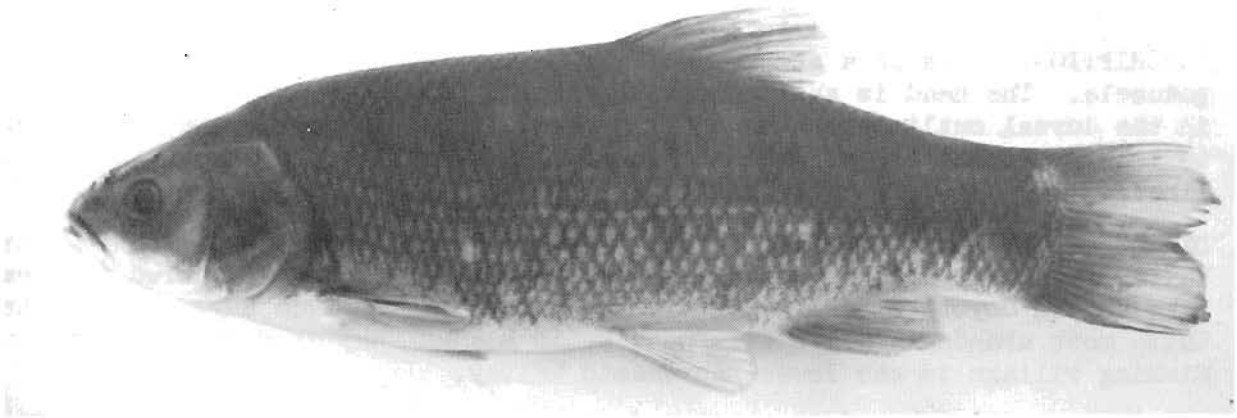
Cook, S. F., Jr., R. L. Moore, and J. D. Conners. 1966. The status of the native fishes of Clear Lake, Lake County, California. Wasmann J. Biol. 24(1):141-160.

Miller, R. R. 1963. Synonomy, characters, and variation of Gila crassicauda, a rare Californian minnow, with an account of its hybridization with Lavinia exilicauda. Calif. Fish Game 49(1):20-29.

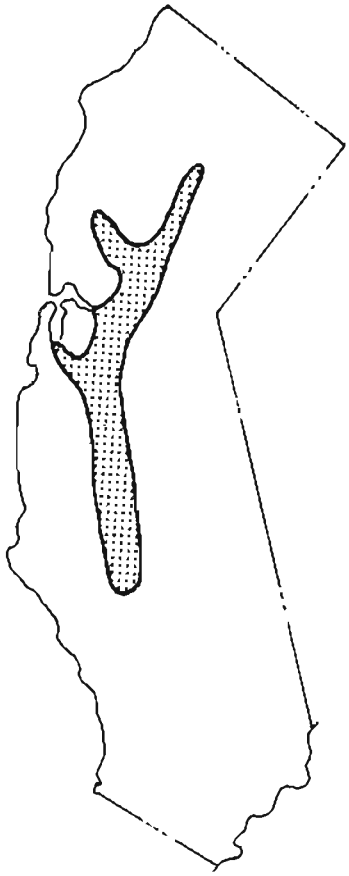
Rutter, C. 1908. The fishes of the Sacramento-San Joaquin basin, with a study of their distribution and variation. Bull. U. S. Bur. Fish. 27(1907):103-152.

Shultz, Peter D., and Dwight D. Simons. 1973. Fish species diversity in a prehistoric Central California Indian midden. Calif. Fish Game 59(2):107-113.

Thicktail Chub



R. R. Miller



TECOPA PUPFISH (Cyprinodon nevadensis calidae) ENDANGERED

DESCRIPTION: This fish is similar to other pupfishes but has larger scales, narrower interorbital, and more posteriorly placed pelvic fins, which have 6 rays. The dorsal fin is farther back than on the Owens pupfish. The caudal fin of males has a prominent black edge, but otherwise this species is similar in color to C. radiosus.

DISTRIBUTION: This subspecies was originally found only in the outflows of North and South Tecopa Hot Springs, Inyo County, from which it has been eliminated. A small population found in 1973 in a spring-fed ditch on a bluff near Tecopa Hot Springs, appears to be the only surviving stock of this pupfish.

STATUS: Endangered. Elimination of the Tecopa pupfish from its original locality was due to the introduction of mosquitofish, alteration of the habitat, and probably contamination of the water. Until March 1973, no populations assignable to this subspecies were found.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the International Union for Conservation of Nature and Natural Resources, and by the Secretary of the Interior.

RECOMMENDATIONS:

... Protect the one surviving population and its habitat.

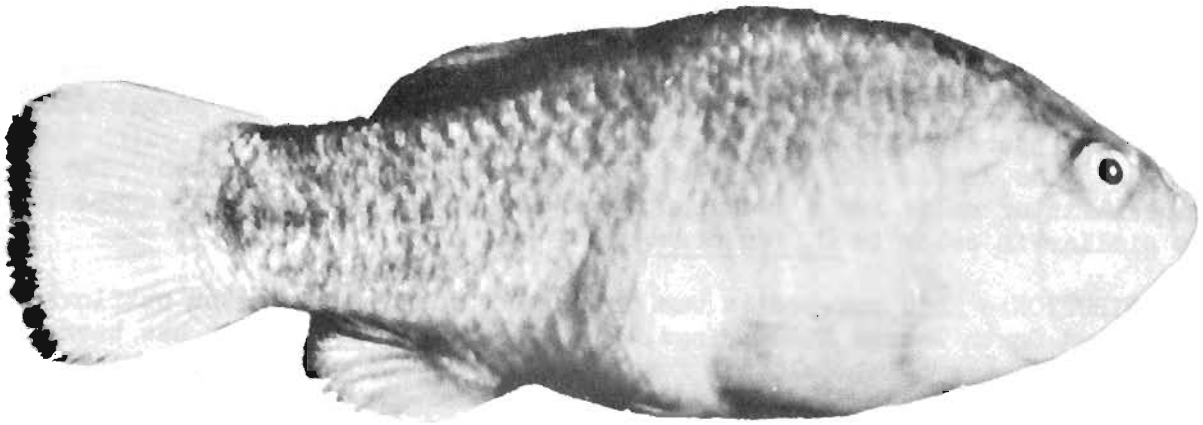
... Continue searching for other existing populations.

... Develop a plan to introduce this fish into additional waters.

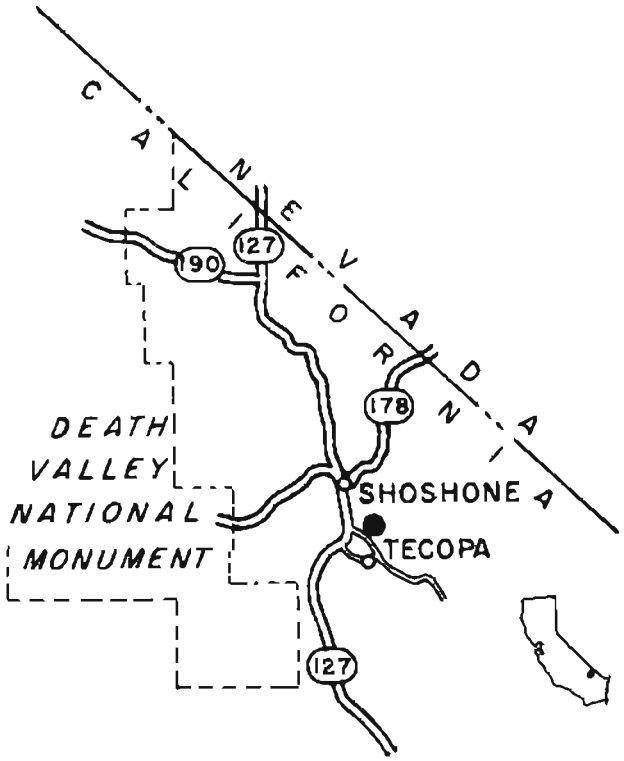
REFERENCES:

Miller, R. R. 1948. The cyprinodont fishes of the Death Valley system of eastern California and southwestern Nevada. Univ. Mich. Mus. Zool. Misc. Publ. 68. 155 pp.

Tecopa Pupfish



E. Philip Pister



BONYTAIL (*Gila elegans*) ENDANGERED

DESCRIPTION: This chub has a short head with a broad snout. The back is sharply arched behind the head, particularly in adults. The caudal peduncle is extremely long and slender and nearly round in cross section. The dorsal and anal fins are large and sickle-shaped, and the caudal fin is long, pointed, and deeply forked. The eyes are small and set low on the head. Color is bluish above and pale below. It grows to about 61 cm (2 ft).

DISTRIBUTION: In California the bonytail is restricted to the Colorado River.

STATUS: Endangered. (Formerly rare.) This fish was associated with the swift, turbid stream flows, which have been drastically changed by the construction of large reservoirs. This species has not been seen in recent years, and may not now exist in California.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Interagency and interstate recovery team formed in 1973 to determine abundance and distribution in lower Colorado River, and to determine what measures are necessary for its survival and replenishment.

RECOMMENDATIONS:

... Prevent further habitat alteration and destruction in the lower Colorado River.

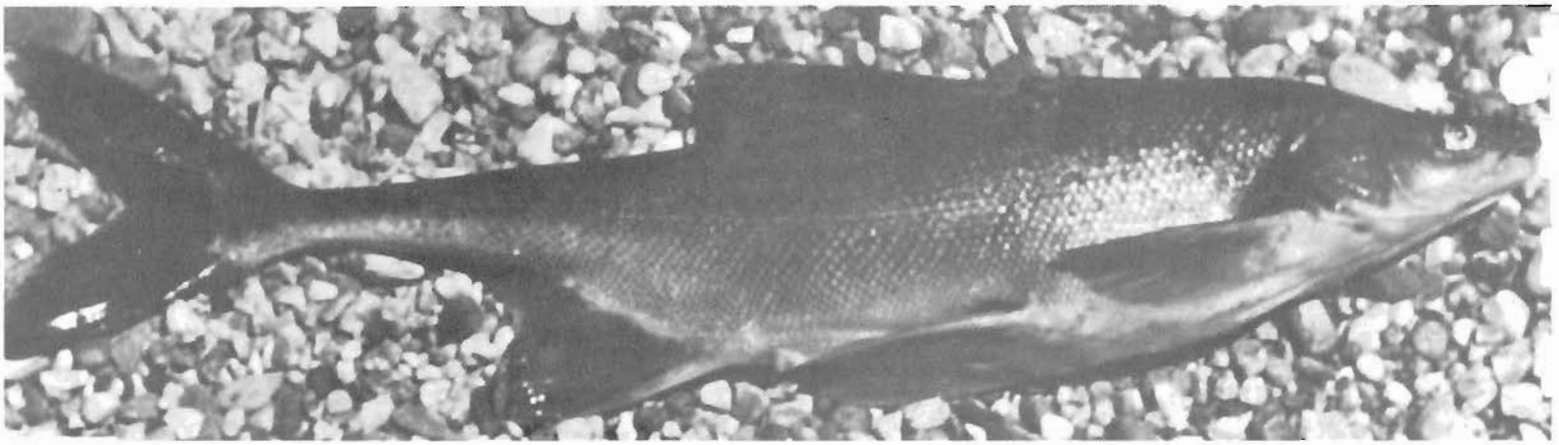
REFERENCES:

Beland, Richard D. 1953. The effect of channelization on the fishery of the lower Colorado River. Calif. Fish Game 39(1):137-139.

Dill, William A. 1944. The fishery of the lower Colorado River. Calif. Fish Game 30(3):109-211.

La Rivers, I. 1962. Fishes and Fisheries of Nevada. Nev. Fish and Game Comm., Reno, Nevada. 782 pp.

Bonytail



Dale Lockhard

HUMPBACK SUCKER (Xyrauchen texanus) ENDANGERED

DESCRIPTION: This resembles other California suckers, except that there is a sharp-edged hump just behind the head, most prominent in large adults. Color is olivaceous except during the breeding season when the dorsal surface turns dark to black, and the ventral surface turns bright orange. It grows to about 61 cm (2 ft) and 3.6-4.5 kg (8-10 lb). Also known as razorback sucker.

DISTRIBUTION: In California it is restricted to the Colorado River.

STATUS: Endangered. (Formerly rare.) Formerly one of the most abundant fishes in the lower Colorado River, its decline was probably the result of alteration of the habitat by dams and channelization, and by competition and predation by introduced species. It is now present in limited numbers, particularly in the reservoirs such as Lake Havasu.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Interagency and interstate recovery team formed in 1973 to determine abundance and distribution in lower Colorado River, and to determine what measures are necessary for its continued survival and replenishment.

RECOMMENDATIONS:

... Prevent further habitat alteration and destruction in the Colorado River.

REFERENCES:

Beland, Richard D. 1953. The effect of channelization on the fishery of the lower Colorado River. Calif. Fish Game 39(1):137-139.

Dill, William A. 1944. The fishery of the lower Colorado River. Calif. Fish Game 30(3):109-211.

Douglas, P. A. 1952. Notes on the spawning of the humpback sucker, Xyrauchen texanus (Abbott). Calif. Fish Game 38(2):149-155.

La Rivers, I. 1962. Fishes and Fisheries of Nevada. Nev. Fish and Game Comm., Reno, Nevada. 782 pp.

Humpback Sucker

Joseph H. Wales

SHORTNOSE SUCKER (Chasmistes brevirostris) ENDANGERED

DESCRIPTION: This is a heavy-bodied sucker, nearly round in cross section, that may grow to 51 cm (20 in). The mouth is terminal, oblique; the thin lips may have striations and/or one row of papillae. The triangular gill rakers are branched and bear five fringed teeth. Color is dusky above and pale below.

DISTRIBUTION: This fish has been collected in Copco Lake (Siskiyou County), Clear Lake Reservoir (Modoc County), and its tributary Willow Creek (Modoc County). However, all recent collections of unhybridized specimens have been from Clear Lake Reservoir and Willow Creek.

STATUS: Endangered. (Formerly rare.) Spawning runs of this species and the Lost River sucker have declined considerably over the past years. Agricultural demands continue to increase in the Lost River system watershed, further threatening the remaining habitat. Apparently, successful spawning of the species occurs only in the main tributary streams above Clear Lake Reservoir in Modoc County. In the Lost River below Clear Lake Reservoir, suckers are lost annually when water releases from the reservoir are terminated. With the existing operation of the reservoir releases, hybridization occurs in the Lost River below the reservoir.

There are no minimum pool requirements in Clear Lake Reservoir. In a critically dry cycle the remaining habitat in both the Reservoir and Willow Creek could be eliminated.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared rare by the International Union for Conservation of Nature and Natural Resources.

... Interagency and interstate recovery team formed in 1973 to determine abundance and distribution in Klamath Basin, and to determine what measures are necessary for its continued survival and replenishment.

RECOMMENDATIONS:

... Prevent further habitat alteration or destruction associated with water development in the Lost River and Upper Klamath River basins.

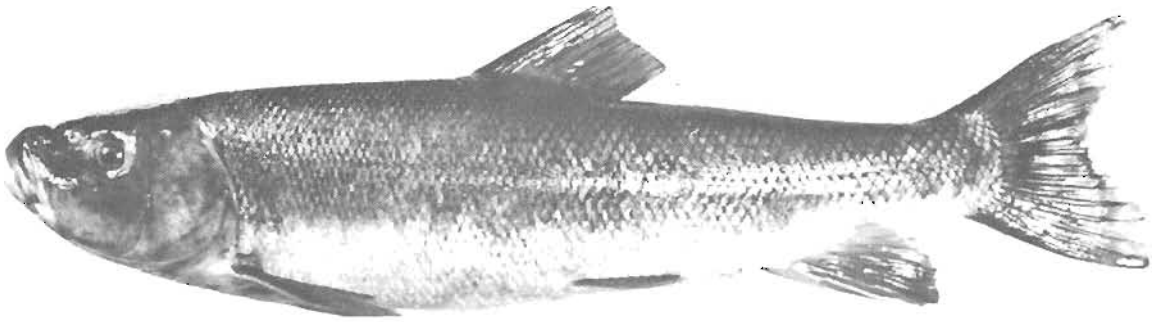
... Investigate the possibility of a minimum pool reservation for fish life in Clear Lake Reservoir, a downstream minimum flow release from Clear Lake Reservoir and the installation of fish screens in the Lost River System.

REFERENCES:

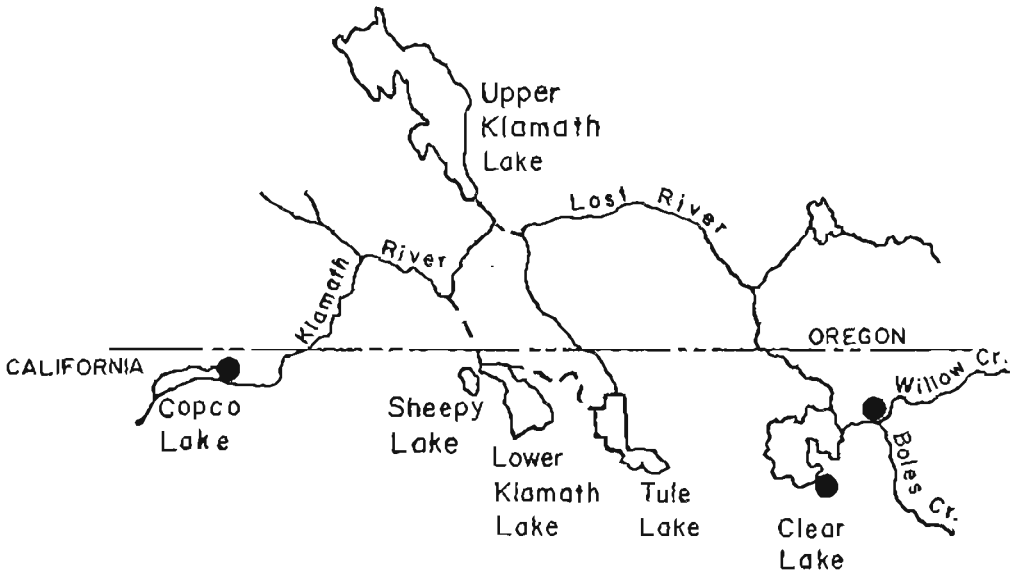
Coots, M. 1965. Occurrences of the Lost River sucker, Deltistes luxatus (Cope), and shortnose sucker, Chasmistes brevirostris Cope, in northern California. Calif. Fish Game 51(2):68-73.

Koch, D. L. and Contreras, G. P. 1973. Preliminary survey of the Fishes of the Lost River System. Univ. Nevada, Desert Res. Inst. Proj. Rep. 45 pp.

Shortnose Sucker



Joseph H. Wales



LOST RIVER SUCKER (Catostomus luxatus) ENDANGERED

DESCRIPTION: This is a large sucker, growing to 91 cm (3 ft). The head is long and slender, with a slight hump on the snout. The mouth is terminal and oblique and may contain some small papillae on the thin lips. The gill rakers are short and triangular, without tufts or teeth on the edges. Color is dark above and pale below.

DISTRIBUTION: This species is native to the Lost River drainage and the upper Klamath River. Historically it has been reported from Copco, Tule, Lower Klamath and Sheepy Lakes. However, a 1973 survey found permanent unhybridized populations only in Clear Lake Reservoir, Modoc County.

STATUS: Endangered. (Formerly rare.) This sucker appears to be restricted to Clear Lake Reservoir. Since no minimum pool reservations for the preservation of fish life are in effect in the reservoir, this species should be considered endangered. In a critically dry cycle, the remaining habitat in Clear Lake Reservoir and its tributaries could be eliminated.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Interagency and interstate recovery team formed in 1973 to determine abundance and distribution in Klamath Basin, and to determine what measures are necessary for its continued survival and replenishment.

RECOMMENDATIONS:

... Prevent further habitat alteration or destruction associated with water development in the Lost River and upper Klamath River basins.

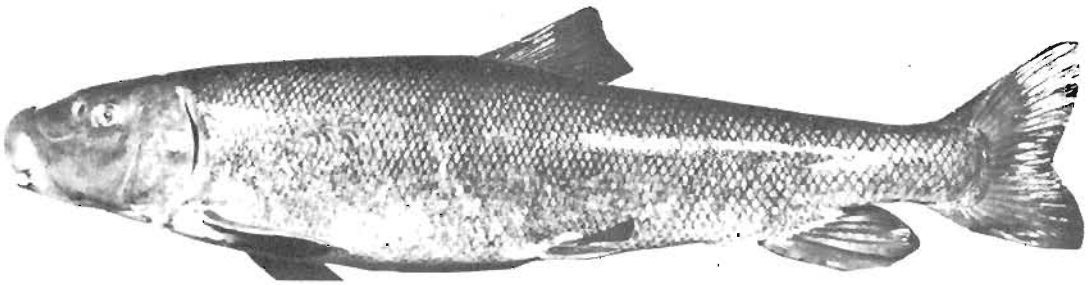
... Investigate the possibility of a minimum pool reservation for fish life in Clear Lake Reservoir, a downstream minimum flow release from Clear Lake Reservoir, and the installation of fish screens in the Lost River System.

REFERENCES:

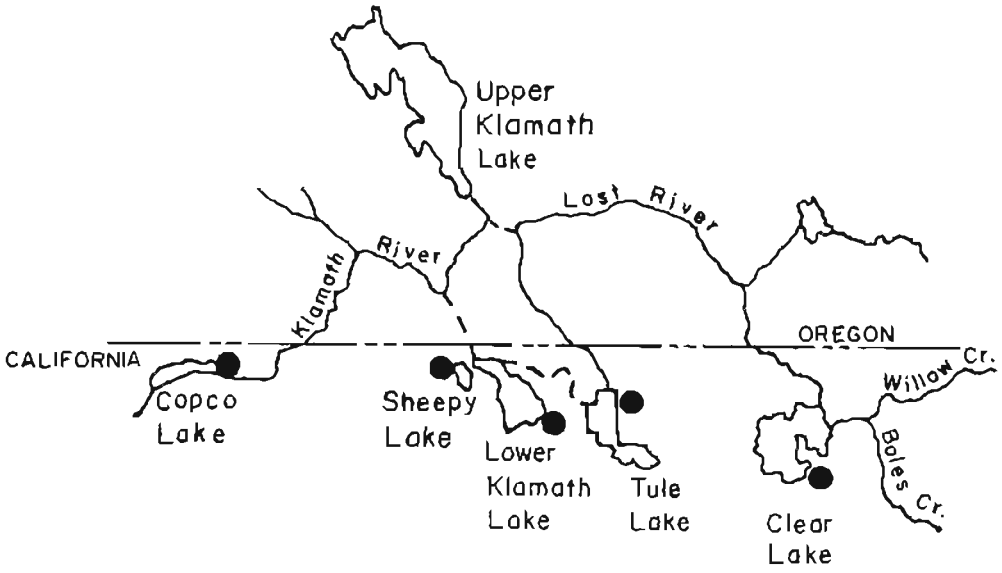
Coots, M. 1965. Occurrences of the Lost River sucker, Deltistes luxatus (Cope), and shortnose sucker, Chasmistes brevirostris Cope, in northern California. Calif. Fish Game 51(2):68-73.

Koch, D. L., and Contreras, G. P. 1973. Preliminary survey of the fishes of the Lost River system. Univ. Nevada, Desert Res. Inst. Proj. Rep. 23. 45 pp.

Lost River Sucker



Joseph H. Wales



UNARMORED THREESPINE STICKLEBACK ENDANGERED
(Gasterosteus aculeatus williamsoni)

DESCRIPTION: Three sharp erectile spines precede the soft dorsal fin. Pelvic fins are sharp spines. The body is without scales but may have 1-3 plates on the sides, though the average number is fewer than 1. Color is greenish to olive above, grading to silvery on the lower sides and belly. Males have scarlet throat and belly, blue eyes, and greenish fins at spawning time. Females have pinkish throat and belly at this time. Size is small, rarely over 76 mm (3 in). This subspecies has fewer lateral plates (0-3), shorter and weaker spines, and more rounded pectoral and caudal fins than the other subspecies of G. aculeatus.

DISTRIBUTION: The unarmored form still persists in the Soledad Canyon portion of the upper Santa Clara River, Los Angeles County. It has probably hybridized with G. a. microcephalus in other areas where it was present.

STATUS: Endangered. Populations from the Los Angeles Basin streams (Los Angeles, San Gabriel, Santa Ana rivers) have been exterminated. The population in the Santa Clara River is threatened by increased recreational use and development in Soledad Canyon.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior, and by the International Union for Conservation of Nature and Natural Resources.

... Interagency recovery team formed in 1973 to determine abundance and distribution in Santa Clara River, and to determine what measures are necessary for its survival and replenishment.

... Transplants made into San Felipe Creek, San Diego County.

RECOMMENDATIONS:

... Prevention of further habitat alteration of the Santa Clara River in Soledad Canyon.

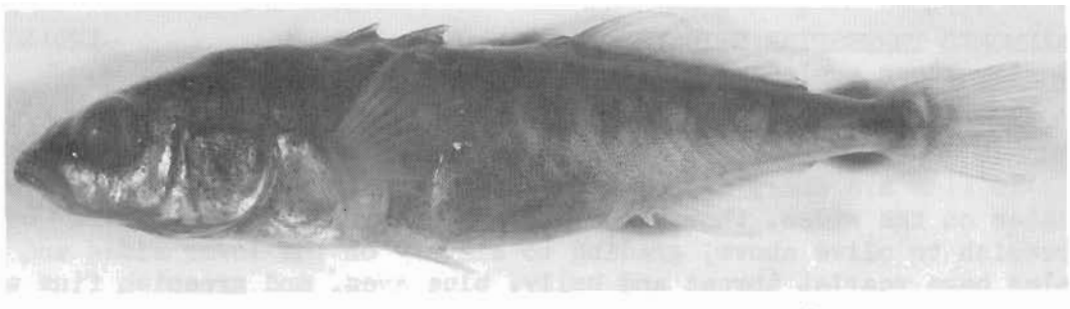
REFERENCES:

Hagen, D. W., and L. G. Gilbertson. 1973. The genetics of plate morphs in freshwater threespine sticklebacks. Heredity 31(1):75-84.

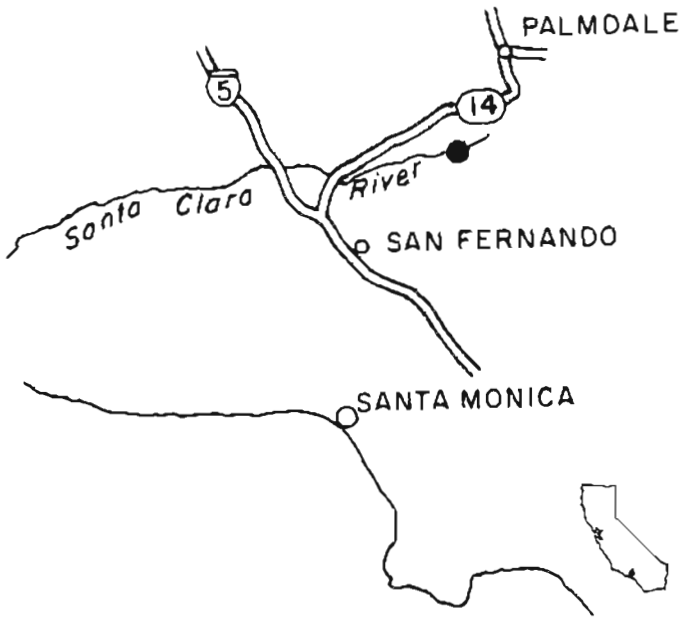
Miller, R. R. 1960. The type locality of Gasterosteus aculeatus williamsoni and its significance in the taxonomy of California sticklebacks. Copeia 1960 (4):348-350.

Miller, R. R., and C. L. Hubbs. 1969. Systematics of Gasterosteus aculeatus, with particular reference to intergradation and introgression along the Pacific Coast of North America: a commentary on a recent contribution Copeia 1969(1):51-69.

Unarmored Threespine Stickleback



Donald Jones



OWENS TUI CHUB (*Gila bicolor snyderi*) ENDANGERED

DESCRIPTION: In life, this subspecies is dusky olive above and whitish below, with blue and gold reflections along the side. There is considerable gold on the side of the head, often strongest along the margin of the preopercle. The fins are generally washed with olive-brown or reddish brown, the pelvics and anal becoming pale posteriorly but lacking a definite whitish border.

DISTRIBUTION: Formerly found throughout the Owens River basin in Mono and Inyo counties, the only pure population now known is located in an 8-mile section of the old Owens River channel below Crowley Lake dam. A few individuals have been transplanted into Owens Valley Native Fish Sanctuary, but the success of this transplant is unknown.

STATUS: Endangered. (New to list.) The population below Crowley Lake is small and extremely vulnerable to further environmental degredation and/or hybridization with *Gila bicolor obesa*, a nonendemic tui chub illegally introduced into Crowley Lake by bait fishermen.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Introduced into Owens Valley Native Fish Sanctuary.

RECOMMENDATIONS:

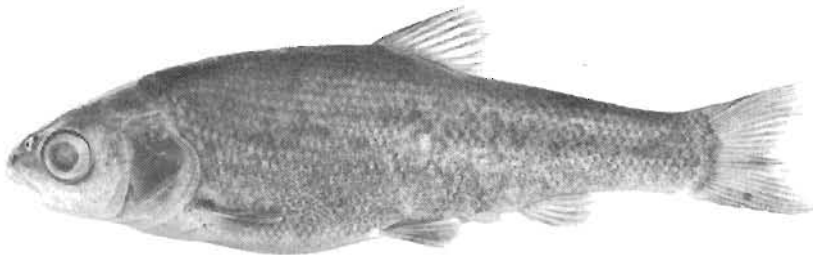
... Provide protection to population below Crowley Lake.

... Seek additional refugia for transplants.

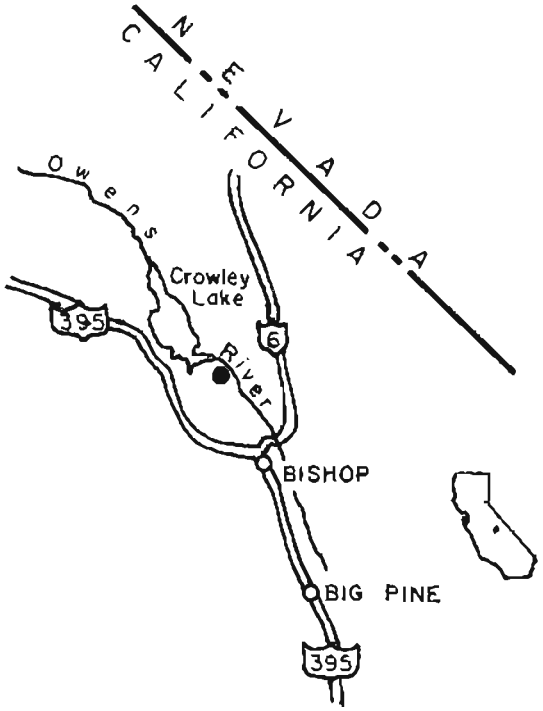
REFERENCE:

Miller, Robert Rush. 1973. Two new fishes, *Gila bicolor snyderi* and *Catostomus fumeiventris*, from the Owens River basin, California. Univ. Mich. Mus. Zool. Occ. Pap. 667. 19 pp.

Owens Tui Chub



Robert R. Miller



OWENS PUPFISH (Cyprinodon radiosus) ENDANGERED

DESCRIPTION: This is a small (less than 51 mm 2 in), stout-bodied fish with notched teeth. The dorsal fin is far forward with a thickened first ray. There are 7 pelvic fin rays. Male breeding coloration is bright blue on the body, with a narrow, dusky to black band on the tail. Females are brown above to whitish below, with dark blotches on the sides.

DISTRIBUTION: Originally abundant in the Owens Valley from near Lone Pine northward to Fish Slough, it is now confined to several small areas in Fish Slough and a small pond north of Big Pine. Preferred habitat is still or slow-moving, shallow water with some vegetation.

STATUS: Endangered. Much of the habitat has been eliminated by drainage and drying of marshy areas through export of water. This species also has been eliminated from some areas by competition from introduced fishes. However, through the cooperative efforts of many state and local officials, they have now become reestablished in large numbers in Fish Slough. The Owens Valley Native Fish Sanctuary, a part of Fish Slough, has been acquired and designated as an Ecological Reserve by the Fish and Game Commission, and the acquisition of additional land within the slough is being sought.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior, and by the International Union for Conservation of Nature and Natural Resources.

... Owens Valley Native Fish Sanctuary established in Fish Slough and designated as an Ecological Reserve.

RECOMMENDATIONS:

... Continue to reestablish this species in as many locations throughout its former range as possible.

... Monitor existing populations to keep abreast of any changes or possible problems.

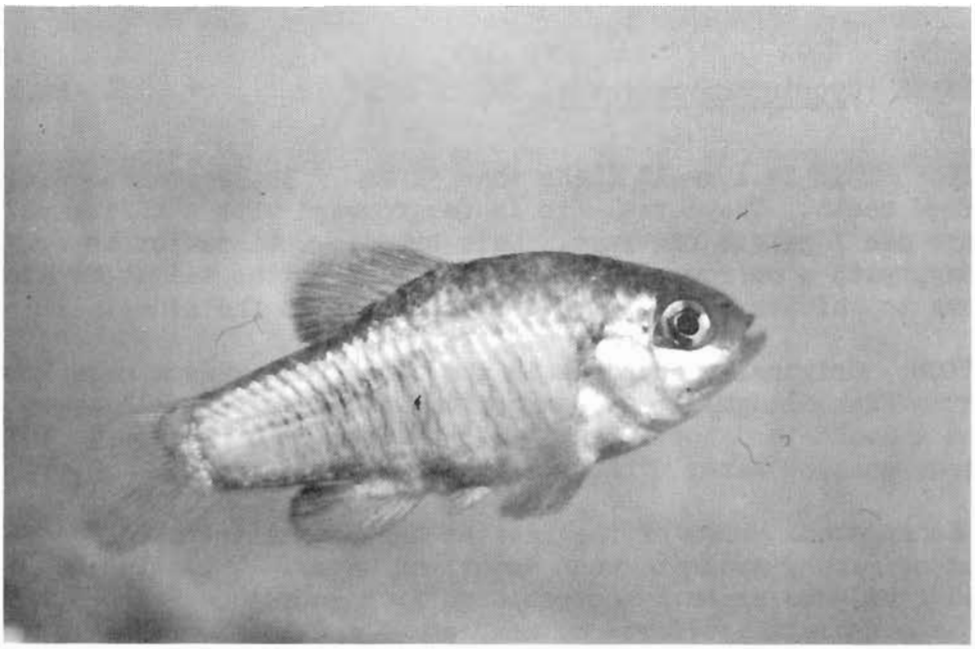
REFERENCES:

Miller, R. R. 1948. The cyprinodont fishes of the Death Valley system of eastern California and southwestern Nevada. Univ. Mich. Mus. Zool. Mich. Misc. Publ. 68. 155 pp.

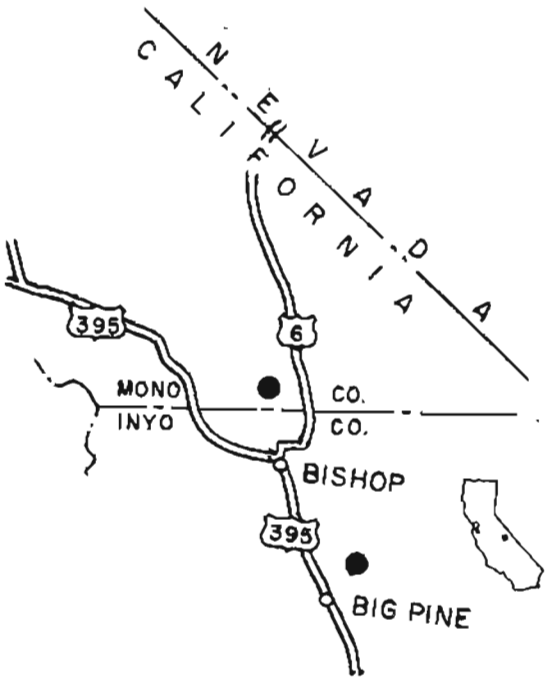
_____. 1961. Man and the changing fish fauna of the American Southwest. Pap. Mich. Acad. Sci. Arts Let. 46(1960):365-404.

Miller, R. R., and E. P. Pister. 1971. Management of the Owens pupfish, Cyprinodon radiosus, in Mono County, California. Trans. Amer. Fish. Soc. 100(3):502-509.

Owens Pupfish



E. Philip Pister



MOHAVE CHUB (Gila mohavensis) ENDANGERED

DESCRIPTION: Its color is dark olive above to bluish or creamy white on the belly. There are brilliant bluish or gold reflections on the sides, giving a metallic appearance. The body is rather slab-sided, with a relatively deep caudal peduncle.

DISTRIBUTION: This species was originally found in the Mohave River from above the junction of the East and West Forks downstream to Soda Lake. In its native habitat it is now restricted to Lake Tuendae and nearby springs at the Zzyzx Mineral Springs Resort on the west side of Soda Lake near Baker, San Bernardino County. It has been successfully introduced into two ponds in southern California.

STATUS: Endangered. A related species (Gila orcutti) was illegally introduced into the Mohave River, and has hybridized with the Mohave chub in all areas except near Baker. As additional populations become established, a change in status to rare may be warranted.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared endangered by the Secretary of the Interior, and by the International Union for Conservation of Nature and Natural Resources.

... Introduced populations are regularly monitored and new transplant sites are being sought.

RECOMMENDATIONS:

... Continue to monitor populations at Zzyzx Springs and the transplant locations periodically to keep abreast of developments or impending problems.

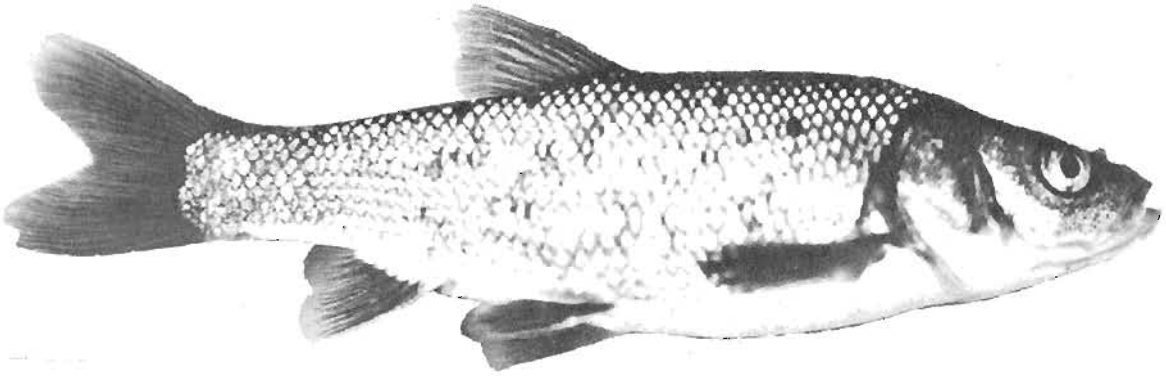
REFERENCES:

Jubbs, C. L., and R. R. Miller. 1943. Mass hybridization between two genera of cyprinidid fishes in the Mohave Desert, California. Pap. Mich. Acad. Sci. Arts Let. 28(1942):343-378.

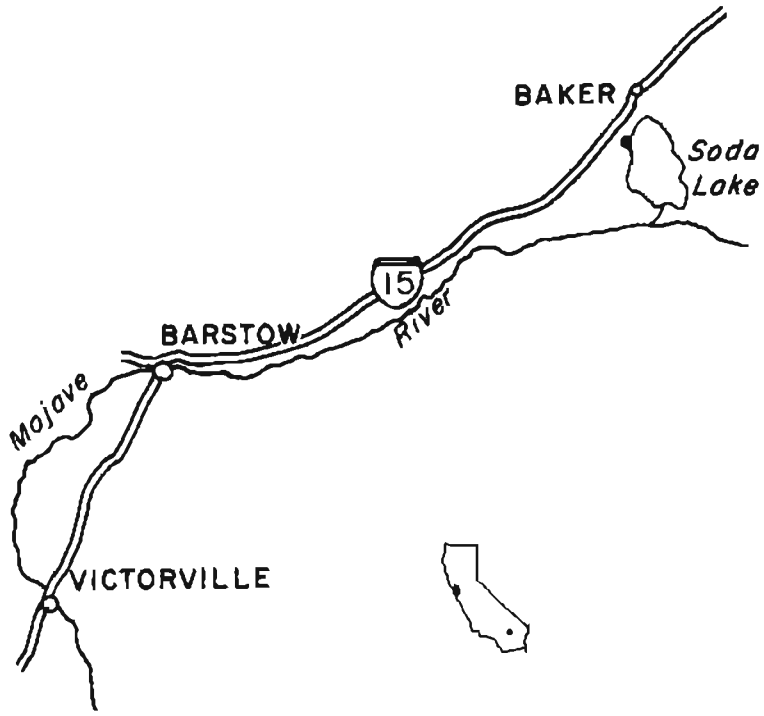
Miller, R. R. 1968. Records of some native freshwater fishes transplanted into various waters of California, Baja California, and Nevada. Calif. Fish Game 54(3):170-179.

St. Amant, J. A., and S. Sasaki. 1971. Progress report on reestablishment of the Mohave chub Gila mohavensis (Snyder) - an endangered species. Calif. Fish Game 57(4):307-308.

Mohave Chub



Leonard Fisk



Our Rare Wildlife

The animals on the following pages are declared rare by the California Fish and Game Commission because their continued existence is threatened by one or more conditions. If the answer is "yes" to any of the following questions, the species (or subspecies) under consideration is declared rare:

...Is it confined to a relatively small and specialized habitat, and is it incapable of adapting to different environmental conditions?

...Although found in other parts of the world, is it nowhere abundant?

...Is it so limited that any appreciable reduction in range, numbers, or habitat would cause it to become endangered?

...If current management and protection programs were diminished in any degree, would it become endangered?

Mammals . . .

SAN JOAQUIN KIT FOX (*Vulpes macrotis mutica*) RARE

DESCRIPTION: This is a small, grizzled gray fox weighing 1.8 - 2.7 kg (4 - 6 lb) with large ears, long legs, and a round black-tipped tail.

DISTRIBUTION: This subspecies of kit fox occurs from the Tehachapi Mountain foothills surrounding the southern end of the San Joaquin Valley, north along the foothills of western San Joaquin Valley to Byron, Contra Costa County, and on the eastern edge of the valley north to Visalia.

STATUS: Rare. It is largely restricted to areas of native vegetation supporting kangaroo rats. Conversion of valley lands to irrigated agriculture is reducing its range, confining it to valley areas unsuited to agriculture, and to rolling foothills and canyons. It numbers between 1,000 and 3,100, with highest population occurring on the valley floor at the southernmost end of the San Joaquin Valley.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Night hunting prohibited by Fish and Game Commission within major range of the San Joaquin kit fox.

... Use of materials toxic to predatory animals prohibited by presidential order on Federal lands.

... Interagency policy established between the Department of Fish and Game, the Department of Food and Agriculture, and the California Agricultural Commissioners Association to review rodent control in areas inhabited by rare or endangered species, including the San Joaquin kit fox.

... Distribution of San Joaquin kit fox in Alameda, San Joaquin, and Tulare counties determined.

... Surveillance made of aerial application of 1080 grain baits for ground squirrel control in San Luis Obispo County.

RECOMMENDATIONS:

... Determine more precisely those areas inhabited by the kit fox, particularly in Stanislaus, Merced, Kings, Monterey and San Benito counties.

... Evaluate those factors threatening San Joaquin kit fox populations, including encroachment of agriculture, illegal shooting, road kills, and incidental poisoning, for the purpose of finding ways to remove these threats.

SAN JOAQUIN KIT FOX (continued)

REFERENCES:

Laughrin, L. 1970. San Joaquin kit fox - its distribution and abundance. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 70-2. 20 pp.

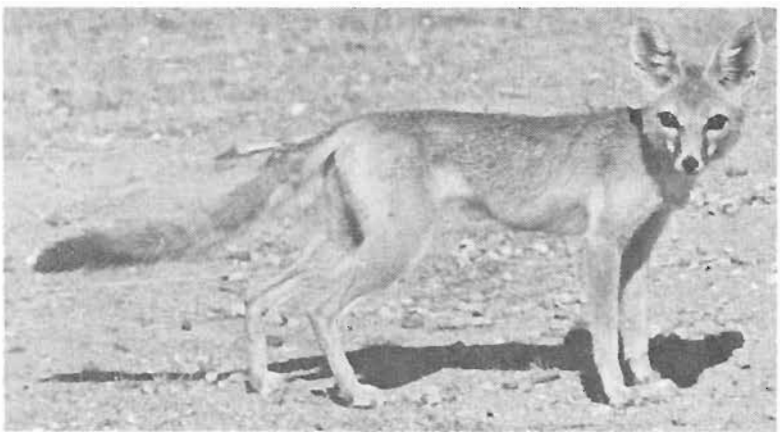
Jensen, C. 1972. San Joaquin kit fox distribution. Bur. of Sport Fisheries and Wildlife, Dep. of the Interior, Sacramento, Calif.

Morrell, S. 1971. Life history of the San Joaquin kit fox. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 71-10. 31 pp.

Swick, C. 1973a. Determination of San Joaquin kit fox range in Contra Costa, Alameda, San Joaquin and Tulare Counties, 1973. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. W-54-R. 15 pp.

_____. 1973b. San Joaquin kit fox--an impact report of secondary hazards of aerial application of 1080 grain baits for ground squirrel control in San Luis Obispo County. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. W-54-R. 14 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.



Herbert Hagen

ISLAND FOX (*Urocyon littoralis*) RARE

DESCRIPTION: The island fox is similar in coloration to the gray fox of mainland California but is much smaller and has a conspicuously short tail.

DISTRIBUTION: Confined to Santa Catalina, San Clemente, San Nicolas, Santa Cruz, Santa Rosa, and San Miguel Islands off the coast of southern California.

STATUS: Rare. The remoteness of the Channel Islands and access control by the military and private landowners provide protection. A survey conducted in 1972-73 revealed that all populations, with the exception of Santa Catalina Island, appear stable and at carrying capacity. The Santa Catalina Island population may be endangered.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Current status of the island fox determined by 1972-73 survey.

RECOMMENDATIONS:

... Initiate a study to determine the status of the Santa Catalina Island population, and the measures needed to assure its survival.

... Continue surveillance of populations on all islands.

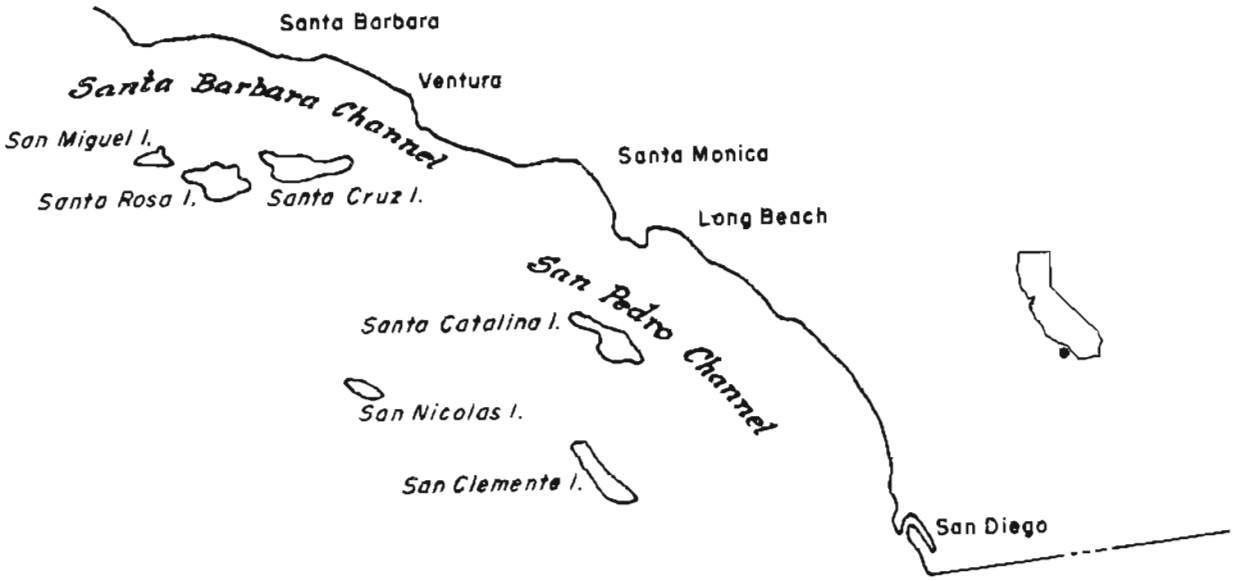
REFERENCES:

Grinnell, J., J. Dixon, and J. Linsdale. 1937. Furbearing mammals of California. Vol. 2. University of California Press, Berkeley, Calif. pp. 377-777.

Laughrin, L. 1971. California island fox survey, 1973. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 73-3. 43 pp.

Island Fox

Lloyd Ingles



WOLVERINE (*Gulo luscus luteus*) RARE

DESCRIPTION: This is a small bear-like animal with shaggy black fur and a brownish stripe along its sides. It is also recognized by its broad head, small eyes, rounded ears, and short, blunt tail. It is the largest member of the weasel family.

DISTRIBUTION: Formerly found in the high Sierra Nevadas from Lake Tahoe south to Mt. Whitney, chiefly above 2,438 m (8,000 ft). Also reported in Shasta County. Its current distribution is not completely known.

STATUS: Rare. Because of its secretiveness it is only rarely seen. In 1933, only 15 wolverine were reported to exist in California. There has been no commercial trapping since 1959. Recent sightings indicate wolverine are becoming more numerous and are extending their range north of Lake Tahoe into Shasta and Trinity counties.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... The California Department of Fish and Game, and the University of California at Berkeley have begun a survey of California furbearing mammals, including the wolverine.

RECOMMENDATIONS:

... Determine current status of the wolverine in California.

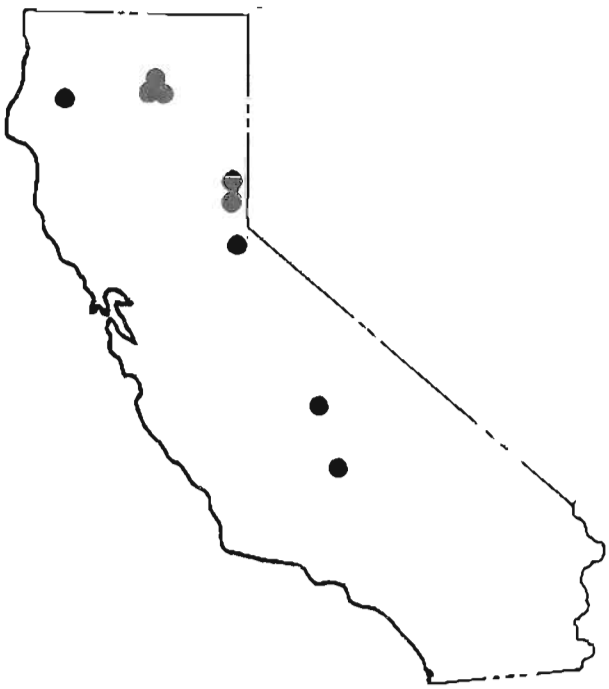
REFERENCES:

Grinnell, J., J. Dixon, and J. Linsdale. 1937. Furbearing mammals of California. Vol. 1. University of California Press, Berkeley, Calif. 376 pp.

Sumner, L., and J. Dixon. 1953. Birds and mammals of the Sierra Nevada. University of California Press, Berkeley, Calif. 484 pp.

Wolverine

Lloyd Ingles



CALIFORNIA BIGHORN SHEEP (*Ovis canadensis californiana*) RARE

DESCRIPTION: This is a subspecies similar to the peninsular and desert bighorn sheep; however, this race tends to have smaller horns and is highly restricted in its distribution.

DISTRIBUTION: It occurs in the Sierra Nevada Mountains from the vicinity of Mammoth Lake south to Mt. Langley. It ranges in elevation from 1,219 m (4,000 ft) to 3,658 m (12,000 ft) with the largest population in the Mt. Baxter and Mt. Williamson area.

STATUS: Rare. This subspecies appears to be declining due to increased human use of high-mountain areas. The population of this subspecies numbers only 215.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Inyo National Forest has set aside a 16,564 ha (41,000 acre) ecological area for the California bighorn.

... California bighorn successfully transplanted from British Columbia into Lava Beds National Monument.

RECOMMENDATIONS:

... Develop and implement a recovery plan designed to remove this animal from its rare status.

... Continued programs of field research and reintroductions for the purpose of re-establishing bighorn sheep within their historic range.

REFERENCES:

Dunaway, D. J. 1970. Status of bighorn sheep populations and habitat studies on the Inyo National Forest. Desert Bighorn Council, Trans. 1970: 127-146.

McCullough, D., and E. R. Schneegas. 1966. Winter observations on the Sierra Nevada bighorn sheep. Calif. Fish Game 52(2):68-84.

Jorgensen, P. D., and D. B. Schaub. 1972. California bighorn sheep survey, Mt. Langley herd unit. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. W-54-R. 7 pp.

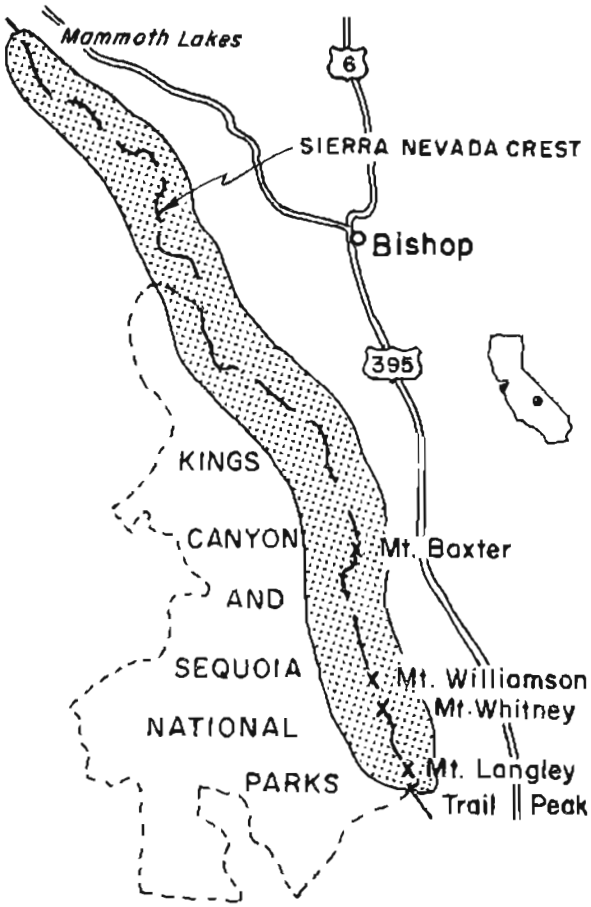
U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Weaver, R. A. 1972a. California bighorn in the Sierra Nevada Mountain Range. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 72-7. 16 pp.

_____. 1972b. Conclusion of the bighorn investigation in California. Desert Bighorn Council, Trans. 1972:56-65.

California Bighorn Sheep

David Dunaway



PENINSULAR BIGHORN SHEEP (Ovis canadensis cremnobates) RARE

DESCRIPTION: Larger and more deer-like than domestic sheep, this subspecies is readily distinguished by its pale color and white rump patch. Both sexes bear true horns which are never shed; males have massive curled horns.

DISTRIBUTION: Peninsular bighorn and desert bighorn co-occur in the Santa Rosa Mountains, Riverside County, and southerly in mountain ranges in San Diego County and Lower California.

STATUS: Rare. Drought, habitat destruction and human disturbance together with illegal shooting continue to threaten bighorn sheep. Surveys indicate a continuous decline in numbers despite increased protection. Bighorn sheep have disappeared from several areas within its historical range in California. Refined population estimates place the numbers of this subspecies at 1170.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Added protection afforded by Anza Borrego State Park, and Game Refuge 4D.

... Waterholes and highway bypasses for sheep are continually developed and maintained by department and other agencies.

... Interagency efforts undertaken to secure critical Santa Rosa mountain bighorn sheep habitat in public ownership.

... Environmental Protection Funds provided for state acquisition of 320 acres of critical habitat on the Santa Rosa Mountains.

... Establishment of an ecological reserve for the desert slender salamander at Hidden Palms, Riverside County has provided added habitat protection for bighorn sheep.

... Society for Conservation of Bighorn Sheep, and Nature Conservancy seeking acquisition of other critical habitat areas.

... The University of California at Riverside has undertaken study of the ecology of the Peninsular bighorn sheep.

RECOMMENDATIONS:

... Protect areas critical to the survival of this subspecies through acquisition, easement, or memorandum of understanding with landowner.

... Develop and implement a recovery plan designed to remove this animal from its rare status.

REFERENCES:

California Department of Fish and Game. 1970. Report on the status of bighorn sheep in California. Wildl. Mgmt. Br., Sacramento, Calif. 107 pp.

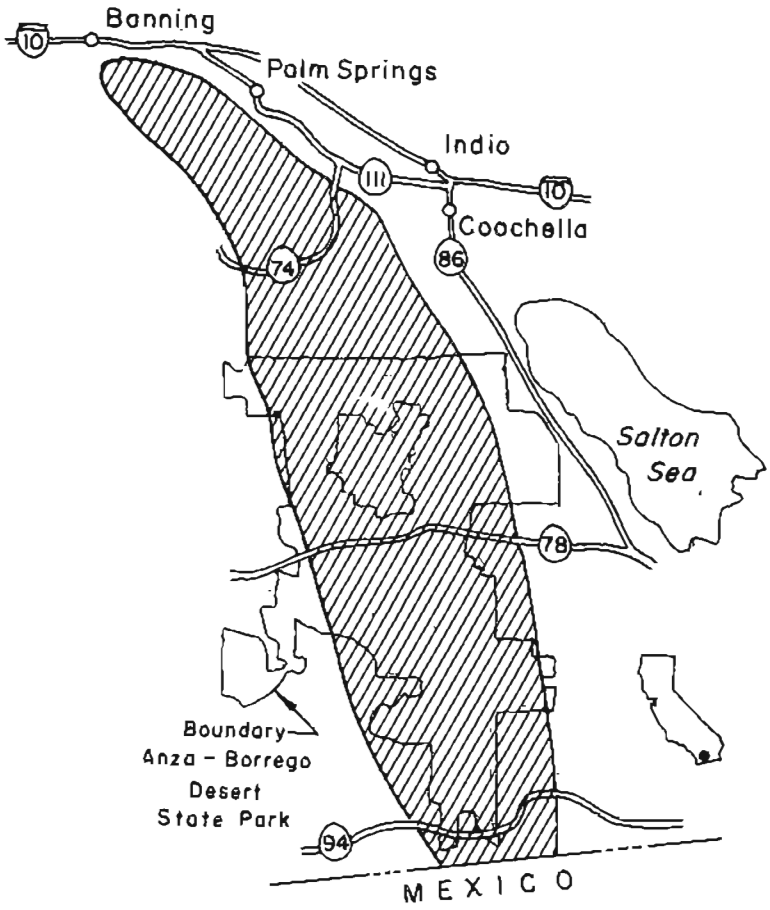
U. S. Department of Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Weaver, R. A. 1972. Conclusion of the bighorn sheep investigation in California. Desert Bighorn Council, Trans. 1972:56-65.

_____, and J. L. Mensch. 1970. Bighorn sheep study in Riverside County. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 70-5. 36 pp.

_____, and W. V. Felt. 1968. A survey of desert bighorn in San Diego County. Calif. Dep. of Fish and Game, Sacramento, Calif. 26 pp.

Wallace Macgregor



GUADALUPE FUR SEAL (Arctocephalus townsendi) RARE

DESCRIPTION: This seal is distinguished from the slightly longer sea lion and other eared seals by having a long pointed snout, low forehead, and soft, dense, plush, blackish-gray fur.

DISTRIBUTION: It occurred historically from the Farallon Islands west of San Francisco, south to San Benito Island, Lower California, Mexico. It was last reported in California waters in 1949 when one was observed on San Nicolas Island.

STATUS: Rare. A breeding colony on Guadalupe Island, Mexico, is slowly increasing in numbers. Human disturbance and illegal shooting is responsible for the slow recovery of this species. The population numbered 600 in 1965.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Fully protected by Mexican government, although permits are issued occasionally for zoo collections.

... Human access to breeding grounds on Guadalupe Island restricted by Mexican government.

RECOMMENDATIONS:

... Initiate cooperative studies with Mexico to monitor the population and determine what measures can be taken to increase their numbers.

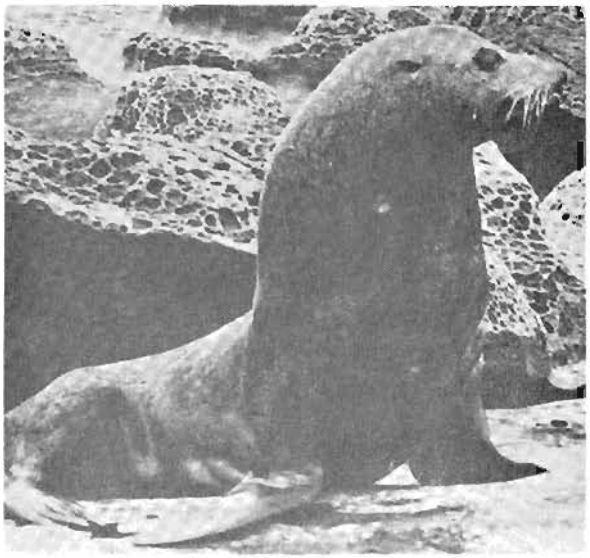
REFERENCES:

Bartholomew, G. A. 1950. A male Guadalupe fur seal on San Nicolas Island, California. J. Mammal. 31:175-180.

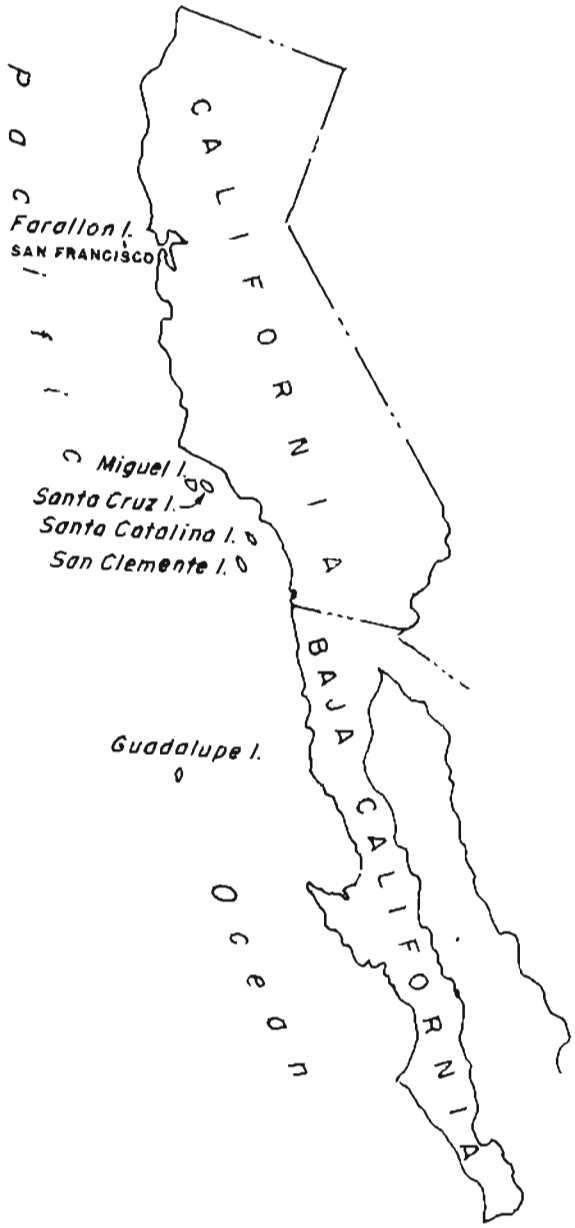
_____. 1952. Winter population of pinnipedia about Guadalupe, San Benito, and Cedros Islands, Baja California. J. Mammal. 33:160-171.

U. S. Department of the Interior. 1973. Threatened Wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

Guadalupe Fur Seal



George Bartholomew



MOHAVE GROUND SQUIRREL (Citellus mohavensis) RARE

DESCRIPTION: This is a small desert-dwelling ground squirrel resembling the antelope ground squirrel. The upper parts are more pinkish without mottling, and the tail under-surface is white instead of cinnamon.

DISTRIBUTION: It occurred historically in the Mohave Desert west to Palmdale, north to Haiwee Mesa, and south to Rabbit Springs near Hesperia, however, in a recent survey they were found in only three locations in San Bernardino County and one location in Los Angeles County.

STATUS: Rare. This species is less numerous than the antelope ground squirrel with which it competes. Accelerated urbanization and land use changes taking place in the Mohave River basin and Antelope Valley are destroying most of its habitat.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Mohave ground squirrel survey conducted in 1972.

RECOMMENDATIONS:

... Identify critical habitat areas.

... Protect remaining habitat through zoning, acquisition, easement, or memorandum of understanding with landowner.

REFERENCES:

Bartholomew, G. W. and J. W. Hudson. 1961. Desert ground squirrels. Sci. Amer. 205(5):107-116.

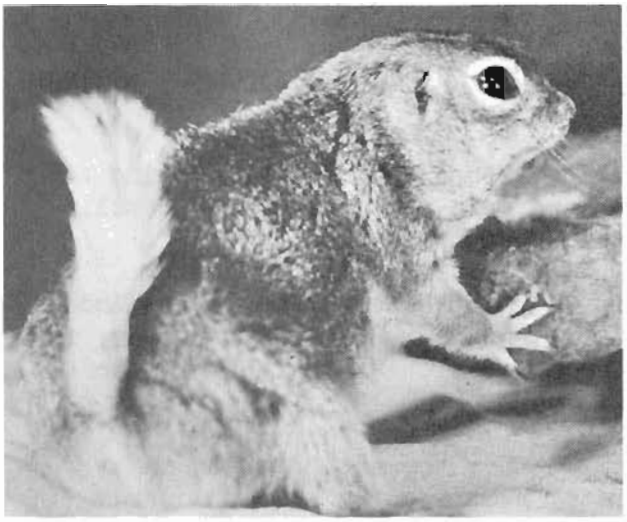
Burt, W. H. 1936. Notes on the habits of the Mohave ground squirrel. J. Mammal. 17(3):221-224.

Howell, A. H. 1938. Revision of the North American ground squirrels. N. Amer. Fauna 56:183-185.

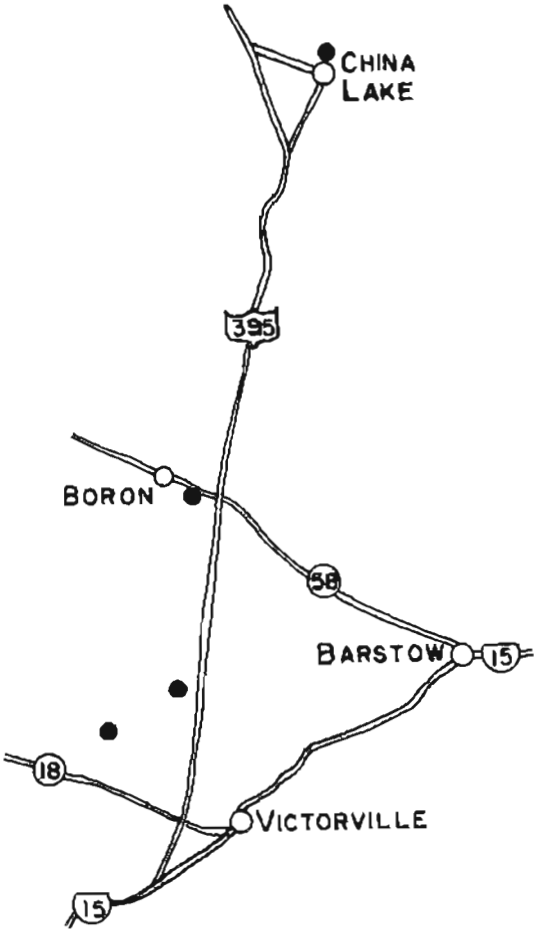
Hoyt, D. F. 1972. Mohave ground squirrel survey, 1972. Calif. Dep. Fish Game Spec. Wildl. Invest. Prog. Rep. W-54-R. 10 pp.

Ingles, L. G. 1965. Mammals of the Pacific States. Stanford University Press, Palo Alto, Calif. 506 pp.

Mohave Ground Squirrel



George Bartholomew



FRESNO KANGAROO RAT (Dipodomys nitratoides exilis) RARE

DESCRIPTION: This subspecies of the dark-colored San Joaquin Valley kangaroo rat is the smallest of the kangaroo rats. Confusion over its identity existed until a recent study confirmed its distinctiveness.

DISTRIBUTION: Long considered extinct after its first discovery in 1891 6.4 km (4 mi) north of a railway station in Fresno, the Fresno kangaroo rat was "rediscovered" in 1934 near Kerman. A systematic search in 1972-73 of its type locality within 24 km (15 mi) of Fresno revealed the presence of a small population near Raisin City. It appears no longer to be present near Kerman or at other sites where it was once reported.

STATUS: Rare. Irrigated agriculture and urbanization have destroyed most of its historical habitat. Now that its true identity is known, there is urgent need to determine its exact distribution. If found to be restricted to the few remaining alkali-sink areas in Fresno County, the Fresno kangaroo rat should be declared endangered and immediate action taken to preserve its habitat.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... A 1972-73 survey revealed the location of a Fresno kangaroo rat population near Raisin City.

... Identity of this subspecies confirmed through taxonomic examination of museum and private collections, and existing population.

RECOMMENDATIONS:

... Continue the search for other populations to determine its current distribution and abundance.

... Protect areas critical to the survival of the Fresno kangaroo rat through acquisition, easement or memorandum of understanding with landowners.

REFERENCES:

Boolootian, R. A. 1954. An analysis of subspecific variations in Dipodomys nitratoides. J. Mammal. 35(4):570-576.

Culbertson, A. E. 1934. Rediscovery of Dipodomys nitroides exilis. J. Mammal. 15(2):161-162.

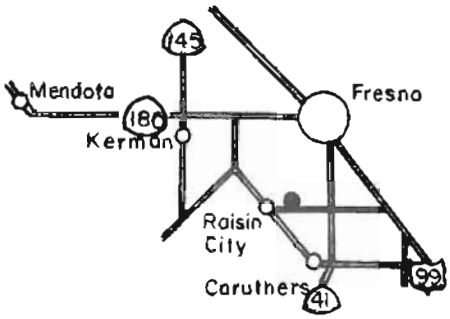
Grinnell, J. 1922. A geographical study of the kangaroo rats of California. Univ. Calif. Publ. Zool. 24(1):1-124.

_____. 1933. Review of the recent mammal fauna of California. Univ. Calif. Publ. Zool. 40(2):71-234.

Hoffman, W. M. 1973. The Fresno kangaroo rat study 1973. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 73-6. 26 pp.

Fresno Kangaroo Rat

Walt Hoffman



STEPHEN'S KANGAROO RAT (*Dipodomys stephensi*) RARE

DESCRIPTION: This species is distinguished from other kangaroo rats by its restricted distribution, and characteristic tail markings and skull measurements.

DISTRIBUTION: Historically it was found in San Jacinto Valley, Riverside, County with small populations in extreme southern San Bernardino Valley, and Northwestern San Diego County. A survey conducted in 1972-73 indicated the Stephen's kangaroo rat occurs in only 15 isolated localities in Riverside County and 1 in San Diego County.

STATUS: Rare. Urbanization and land use change have destroyed most of its original habitat. Small populations appear to be persisting in localized areas of abandoned agriculture land succeeding to native vegetation. Urban and industrial developments now threaten the existence of this species.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Current distribution and abundance determined by 1972-73 survey.

RECOMMENDATIONS:

... Preserve critical areas through zoning, acquisition, easement, or memorandum of understanding with landowner.

... Conduct a life history study to determine biology and habitat requirements.

REFERENCES:

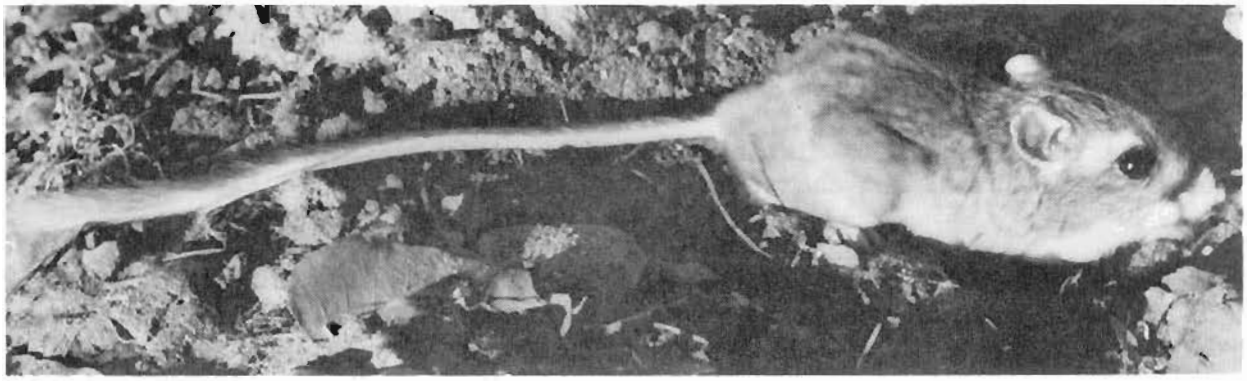
Grinnell, J. 1922. A geographical study of the kangaroo rats of California. Univ. Calif. Publ. Zool. 24(1):1-124.

_____. 1933. Review of the recent mammal fauna of California. Univ. Calif. Publ. Zool. 49(2):71-234.

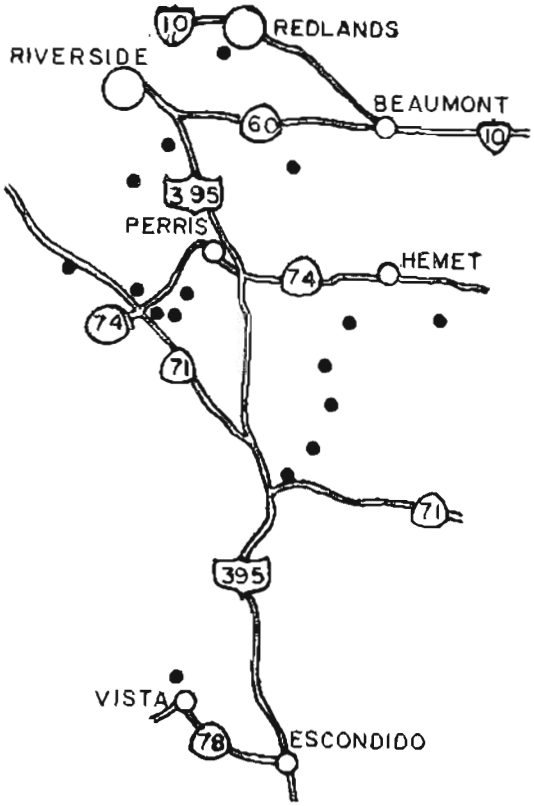
Lackey, J. A. 1967. Biosystematics of Heermanni group kangaroo rats in southern California. Trans. San Diego Soc. Nat. Hist. 14(22):313-344.

Thomas, J. R. 1973. Stephen's kangaroo rat survey, 1972-73. Calif. Dep. Fish Game Wildl. Mgmt. Admin. Rep. 73-5. 56 pp.

Stephen's Kangaroo Rat



James Thomas



Birds. . .

CALIFORNIA BLACK RAIL (*Laterallus jamaicensis coturniculus*) RARE

DESCRIPTION: This is a sparrow-sized blackish rail with a small black bill, white-speckled back, and white bars on its sides.

DISTRIBUTION: Historically it occurred in limited numbers in salt marshes from Tomales Bay south to Lower California, and in inland freshwater marshes, including portions of the Colorado River. Known to nest in recent years only along the Colorado River from Laguna to Imperial dams and at West Pond, Imperial County.

STATUS: Rare. Because of its secretiveness and small numbers it is only rarely seen. Destruction of coastal and inland wetlands by filling and draining threatens habitat vital to its existence. Its current distribution and numbers are as yet undetermined.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... A black rail survey of the Colorado River undertaken by U. S. Fish and Wildlife Service and Arizona State University.

RECOMMENDATIONS:

... Bring West Pond under management by the California Department of Fish and Game under a general plan approved by U. S. Fish and Wildlife Service.

... Determine the current statewide status of the California black rail.

... Protect areas critical to the survival of the California black rail through acquisition, easement or memorandum of understanding with landowner.

REFERENCES:

Grinnell, J. and A. H. Miller. 1944. The distribution of the birds of California. Cooper Ornith. Club, Berkeley. pp. 130-131.

Wilbur, S. R. 1973. The literature of the California black rail. Office of Endangered Species, Bur. of Sport Fisheries and Wildlife, Dep. of the Interior, Washington, D. C. 21 pp.

U. S. Department of the Interior. 1973. Threatened wildlife of the United States. Bur. Sport Fish. Wildl. Resource Publ. 114. 289 pp.

California Black Rail

Bob Gill

CALIFORNIA YELLOW-BILLED CUCKOO (Coccyzus americanus occidentalis) RARE

DESCRIPTION: This is a robin-sized brown bird with white underparts, cinnamon colored outspread wings, and a long tail with white spots. It is never found far from dense streamside growth.

DISTRIBUTION: Although never very numerous in California, the California yellow-billed cuckoo historically nested along river and streams from Shasta County to southern California and along the Colorado River. Sparse breeding populations are known now to occur along the Colorado River and the Sacramento River from Red Bluff to Colusa, and in the Butte Sink. Cuckoos arrive in late May and depart in September.

STATUS: Rare. Its habitat of dense streamside plant growth has been destroyed by the accelerated land and water use changes which have occurred throughout most of California. Twenty-five acres of suitable riparian vegetation is required to support 1 pair. In a 1973 survey, 47 cuckoos were observed at 32 localities on the Sacramento River, including the Butte Sink. Estimated Sacramento Valley population is 120 pairs.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Survey of California yellow-billed cuckoo distribution and abundance in Sacramento Valley accomplished by Department of Fish and Game in 1973.

... Arizona State University initiated a comprehensive Colorado River study of riparian plant and animal communities.

RECOMMENDATIONS:

... Conduct a statewide survey of California yellow-billed cuckoo distribution and abundance.

... Protect key riparian habitat along the Sacramento and Colorado Rivers from the impact of flood control and channelization projects.

... Preserve the West Bank of Woodson Bridge State Park in its natural state as an ecological reserve.

... Preserve other critical habitat areas in their natural state through acquisition, easement, or memorandum of understanding with landowner.

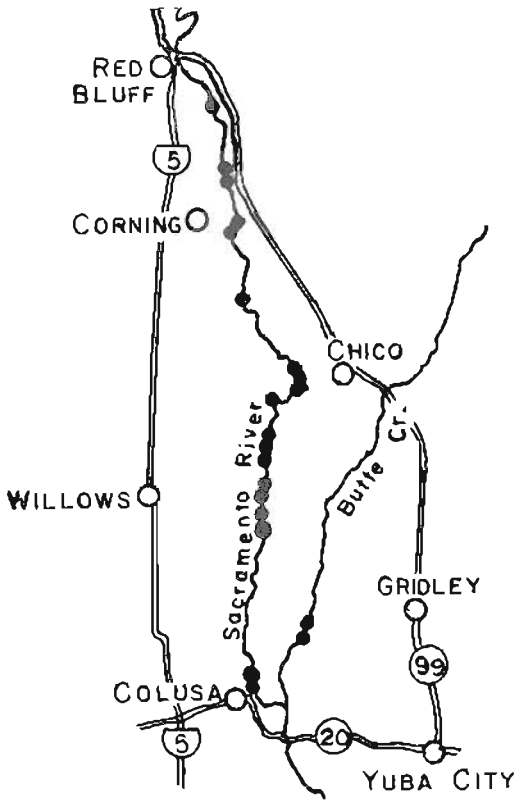
REFERENCES:

Gaines, D. 1973. Distribution, density and habitat requirements of the California yellow-billed cuckoo in the Sacramento Valley: 1972-73.

Grinnell, J. and A. H. Miller. 1944. The distribution of the birds of California. Cooper Ornith. Club, Berkeley. pp. 186-187.

California Yellow-Billed Cuckoo

Hal Harrison



Reptiles . . .

GIANT GARTER SNAKE (Thamnophis couchi gigas) RARE

DESCRIPTION: This is one of the largest garter snakes, reaching 137 cm (4½ ft). The basic color is dull brown with a checkered pattern of well separated black spots on the dorsal side. There is a dull yellow middorsal stripe, and the lateral stripes are often not developed. The head is elongate with a pointed muzzle.

DISTRIBUTION: The original range of this snake was the San Joaquin Valley from the vicinity of Sacramento and Antioch southward to Buena Vista Lake. It is one of the most aquatic of garter snakes and is confined to areas around permanent freshwater.

STATUS: Rare. Populations have been decimated or eliminated by land use changes and the filling of sloughs and draining of marshy areas. Heavy use of pesticides is also suspected of having detrimental effects on this snake.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Listed as "status undetermined" by the Secretary of the Interior.

... The Department of Fish and Game has conducted preliminary surveys and has initiated a cooperative study with California State University, Sacramento to determine the status of this snake.

... The managers of several wildlife areas have been notified of the presence of this snake on their areas.

RECOMMENDATIONS:

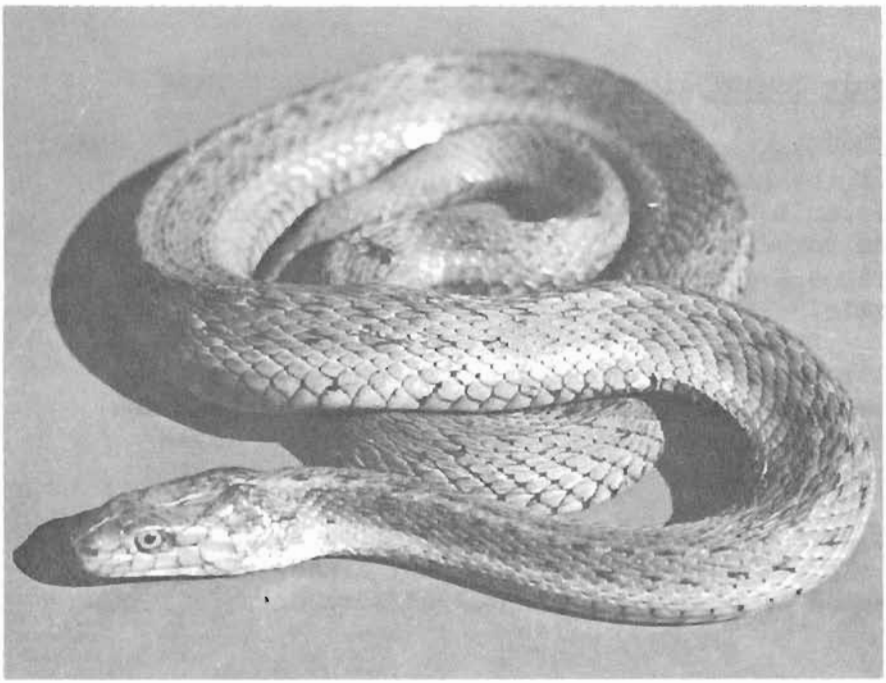
... Encourage managers of wildlife areas and private duck club operators to protect and retain habitat for this snake.

REFERENCES:

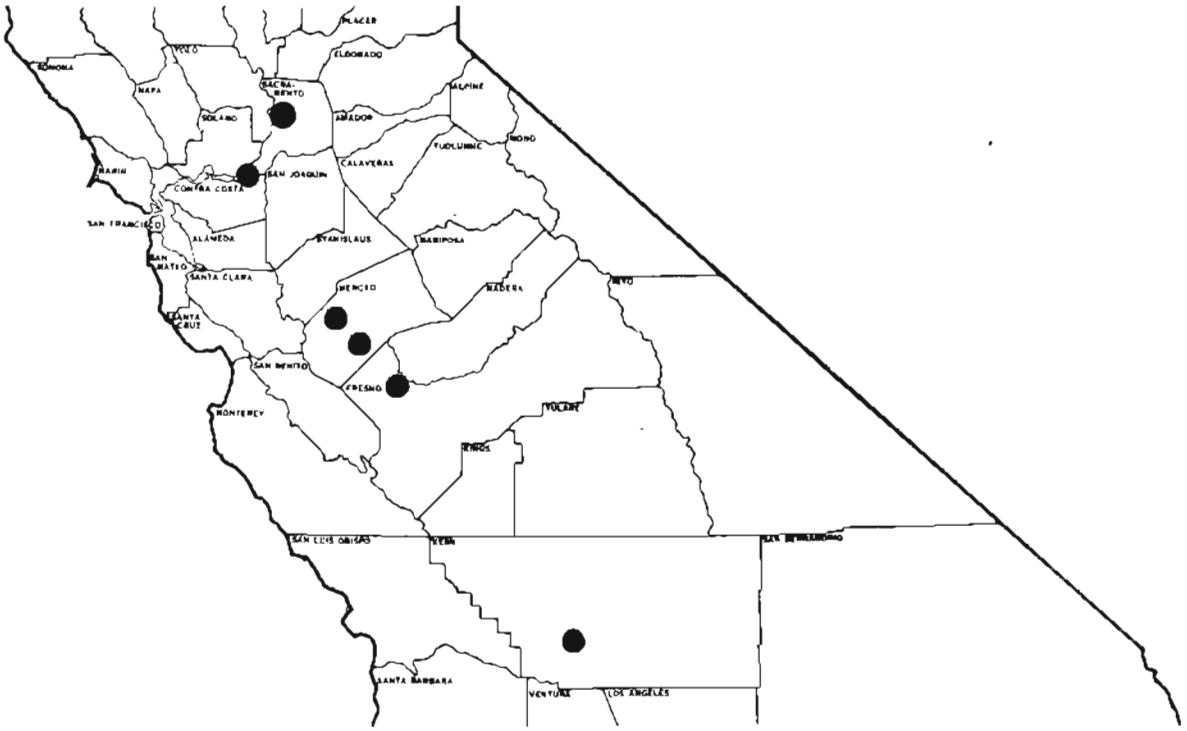
Fitch, H. S. 1940. A biogeographical study of the ordinoides Artenkreis of garter snakes (genus Thamnophis). Univ. Calif. Publ. Zool. 44(1):1-150.

Fox, W. 1951. Relationships among the garter snakes of the Thamnophis elegans Rassenkreis. Univ. Calif. Publ. Zool. 50(5):485-530.

Giant Garter Snake



John M. Brode



ALAMEDA STRIPED RACER (*Masticophis lateralis euryxanthus*) RARE

DESCRIPTION: This is a slender, fast-moving snake with a narrow neck and relatively broad head with large eyes. Color is black or dark brown above, with a distinct orange stripe down each side to or beyond the vent. The lateral stripe is one and two half-scale rows wide. That in the subspecies *lateralis* is only two half-scale rows wide. The forward portions of the ventral surface are orangish, and the posterior portions are cream grading to pinkish on the underside of the body and tail. Adults grow to a length of 91-112 cm (3-4 ft).

DISTRIBUTION: This racer occurs in the valleys, foothills, and low mountains of the Coast Range east of San Francisco Bay. It is usually associated with chaparral, but may occur in grassland, open woods, and on rocky slopes.

STATUS: Rare. This is considered one of the rarest snakes in the East Bay region. The habitat has been reduced in recent years by construction and development.

ACTIONS:

... Take, possession, and sale prohibited by state law.

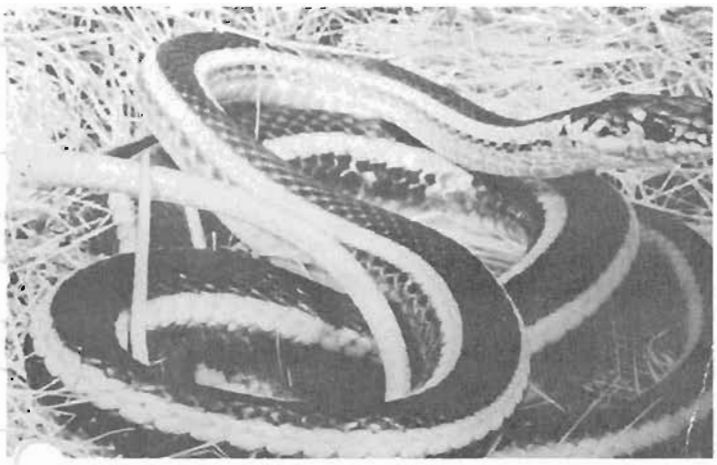
... Operators of several East Bay parks have been notified of the status of this snake and its probable occurrence in the parks.

RECOMMENDATIONS:

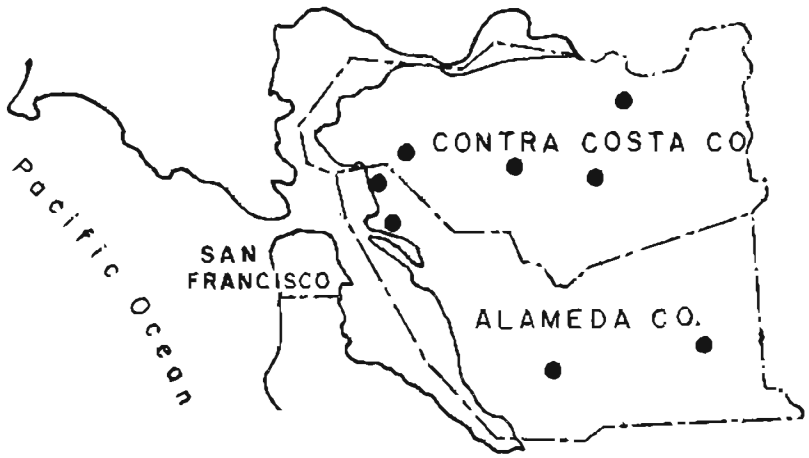
... Provide open space suitable for this snake in the East Bay area, if possible.

REFERENCES:

Reimer, W. J. 1954. A new subspecies of the snake *Masticophis lateralis* from California. Copeia 1954(1):45-48.



Nathan W. Cohen



Mammals . . .

SOUTHERN RUBBER BOA (Charina bottae umbratica) RARE

DESCRIPTION: This is a stout-bodied snake with a short, blunt tail that resembles the head. The skin is smooth and shiny. The scales on top of the head are large and sometimes asymmetrical. Color is olive or pale yellowish-brown dorsally and light yellow below. There is no pattern, but there may be a few dusky flecks on the lower sides. Adults grow to about 51 cm (20 in).

DISTRIBUTION: This snake has been collected from several localities in the San Bernardino Mountains, San Bernardino County, near Idyllwild, Riverside County, and Mt. Pinos, Kern County.

STATUS: Rare. Only a few specimens have been collected, indicating low population levels where present. It is threatened by increased recreation use of the forested areas where it occurs.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... The Department of Fish and Game has initiated a cooperative study with California Polytechnic University, Pomona, to determine the distribution and status of this snake.

RECOMMENDATIONS:

... Provide strict enforcement of protective laws to prevent collection.

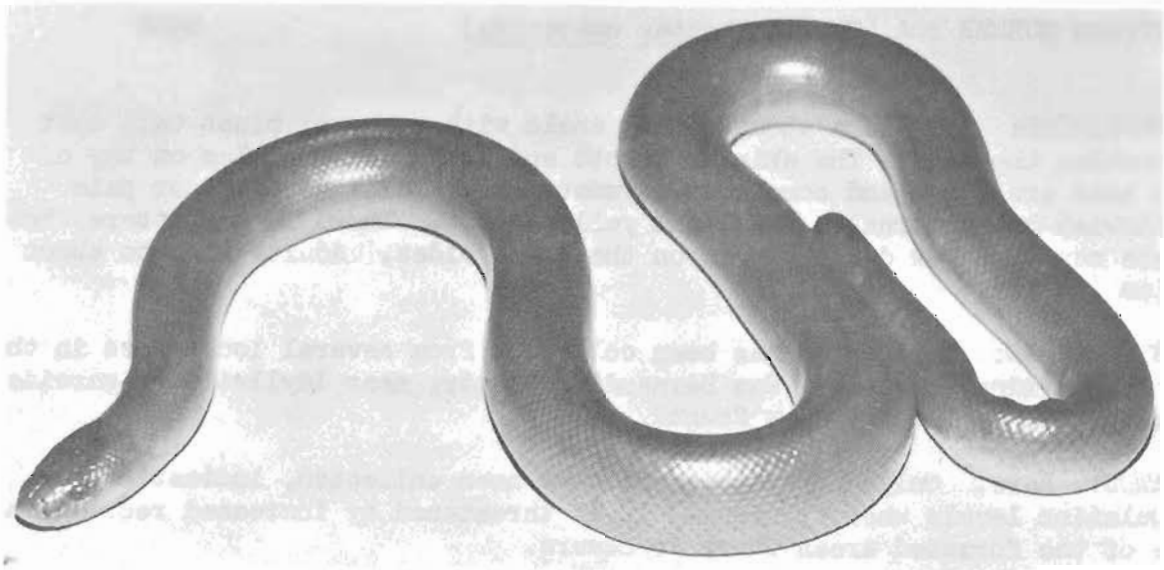
... Investigate the possible occurrence of this snake in the San Gabriel Mountains.

REFERENCES:

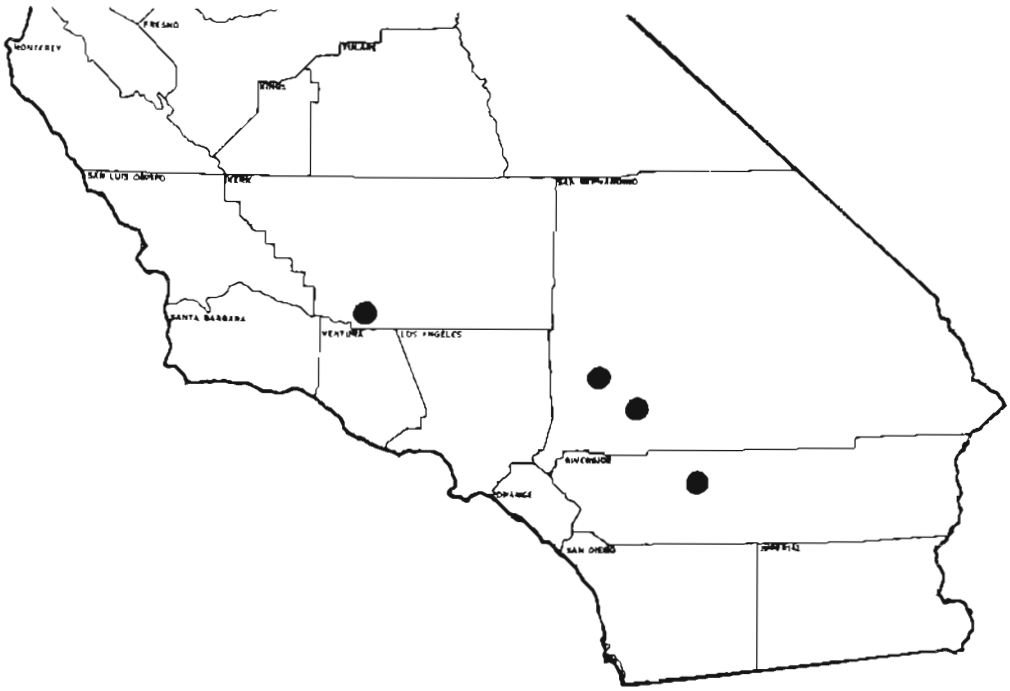
Cunningham, J. D. 1966. Observations on the taxonomy and natural history of the rubber boa, Charina bottae. Southwest. Natur. 11:298-299.

Klauber, L. M. 1943. The subspecies of the rubber snake, Charina. Trans. San Diego Soc. Nat. Hist. 10(7):83-90.

Southern Rubber Boa



Glenn R. Stewart



Amphibians . . .

BLACK TOAD (*Bufo exsul*) RARE

DESCRIPTION: This small toad rarely exceeds 76 mm (3 in). The dorsal surface often appears as a shining, lacquer-black. There is a narrow white or cream dorsal stripe. The underside is white or cream with dense mottling and marbling of black. The throat is often spotted with dark markings.

DISTRIBUTION: This toad is found only in and around Deep Springs (Buckhorn Springs) and Antelope Springs in Deep Springs Valley, Inyo County. It inhabits only watercourses and marshes adjacent to the springs. Adults are mostly aquatic.

STATUS: Rare. Population sizes vary but appear to be adequate for maintenance of this form. The range is extremely restricted, amounting to only a few acres.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared threatened by the Secretary of the Interior and rare by the International Union for Conservation of Nature and Natural Resources.

... Officials of Deep Springs College, who own the property at Buckhorn Springs, have been apprised of the legal status of this form. An area has been fenced to exclude livestock, and water will be manipulated to minimize damage to the habitat.

RECOMMENDATIONS:

... Preserve critical habitat on private lands through acquisition or agreement with landowner.

... Establish a monitoring program to insure the perpetuation of this species.

... Evaluate the need to control or eradicate carp at Buckhorn Springs.

REFERENCES:

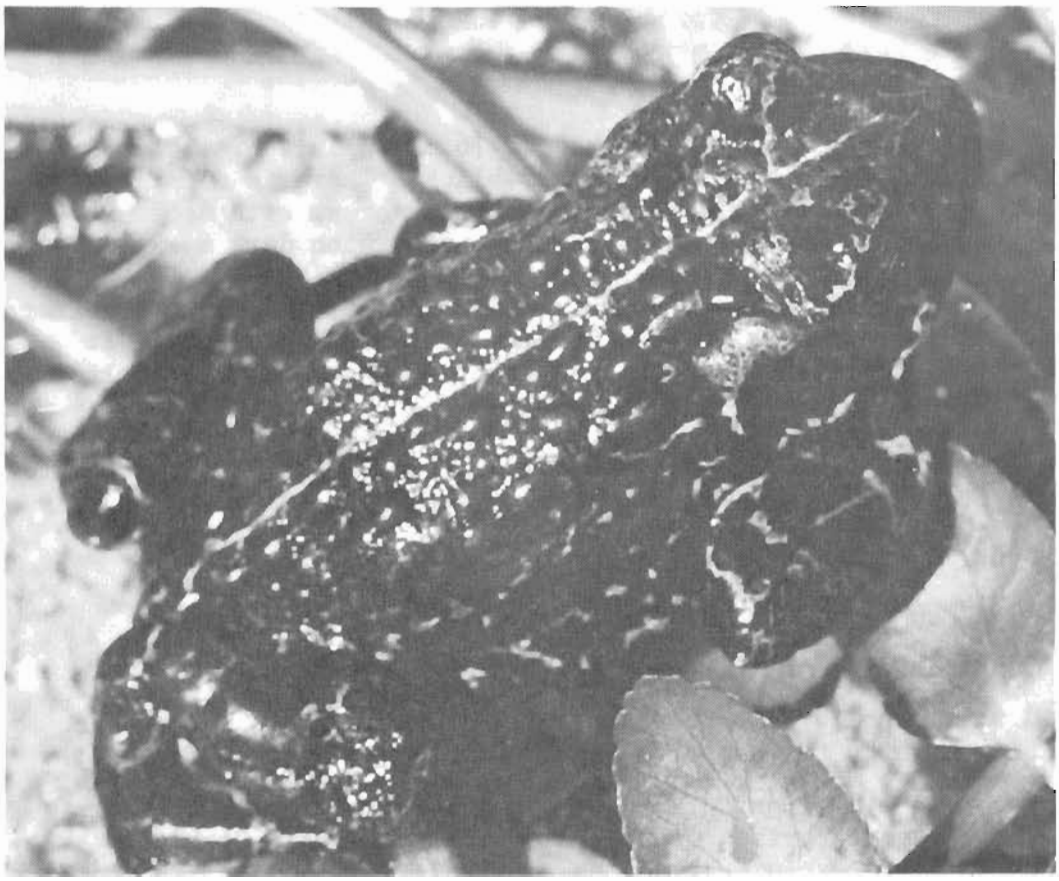
Myers, G. S. 1942. The black toad of Deep Springs Valley, Inyo County, California. Occ. Pap. Mus. Zool. Univ. Mich. 460:1-13.

Schuierer, F. W. 1961. Remarks upon the natural history of *Bufo exsul* Myers, the endemic toad of Deep Springs Valley, Inyo County, California. Herpetologica 17(4):260-266.

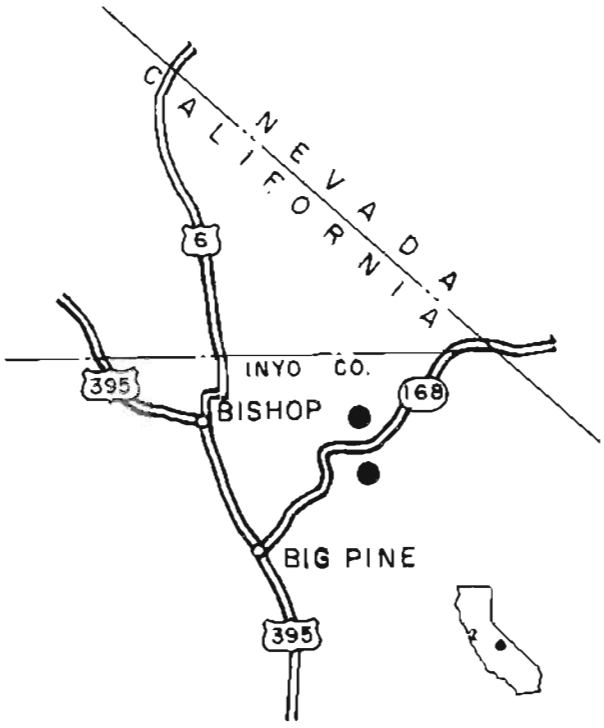
_____. 1962. Notes on two populations of *Bufo exsul* Myers, and a commentary on speciation within the *Bufo boreas* group. Herpetologica 18(4):262-267.

_____. 1972. The current status of the endangered species *Bufo exsul* Myers, Deep Springs Valley, Inyo County, California. Herpetol. Rev. 4(3):81-82.

Black Toad



David Dunaway



SISKIYOU MOUNTAIN SALAMANDER (Plethodon stormi) RARE

DESCRIPTION: This is a slim-bodied salamander with short legs. Color is dull brown to chocolate brown on the dorsal surface and sides, often profusely speckled with white or yellowish flecks. The ventral surface is purplish gray. Adults grow to 102-152 cm (4-6 in).

DISTRIBUTION: Occurs near the Hutton Guard Station, the Cook and Green Guard Station, and along Joe Creek in the upper Applegate River drainage, and nearby in Seiad Creek in the Klamath River drainage, Siskiyou County. It is associated with loose rock rubble and talus on north facing slopes, or with heavily wooded areas.

STATUS: Rare. This form is present only in the areas described and a short distance into Oregon. It is closely related to the Del Norte salamander (P. elongatus), intergrades of which have recently been found.

This salamander's known habitat is Oregon, including the type locality, would be flooded by the proposed Applegate Reservoir for which the U. S. Army Corps of Engineers is currently seeking construction funds.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... The U. S. Army Corps of Engineers has been informed of the occurrence of this salamander in areas which would be flooded by the proposed Applegate Reservoir.

RECOMMENDATIONS:

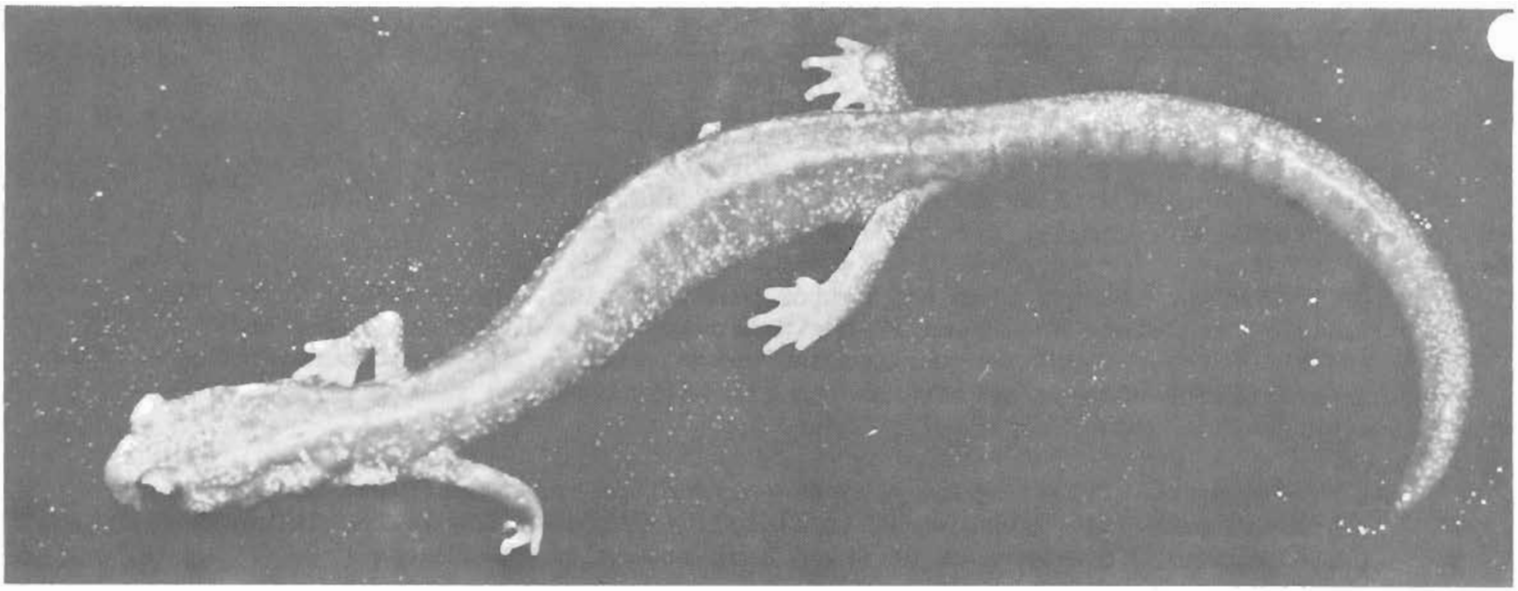
... Conduct studies to determine if additional populations occur in California.

... Initiate a cooperative management plan with the U. S. Forest Service to protect habitat for this salamander.

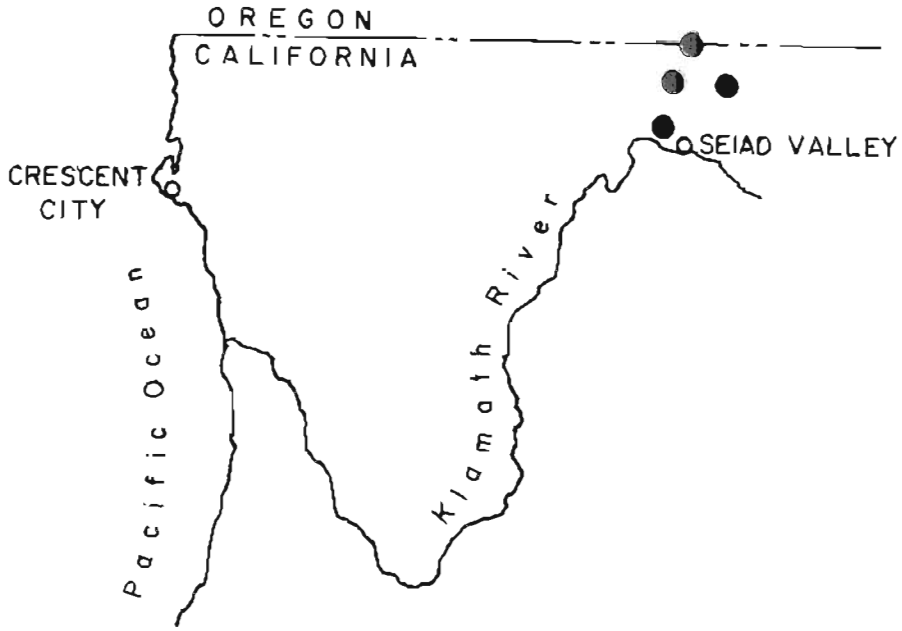
REFERENCES:

Brodie, E. D. 1970. Western salamanders of the genus Plethodon: Systematics and geographic variation. Herpetologica 26(4):468-516.

Siskiyou Mountain Salamander



Arden H. Brame, Jr.



LIMESTONE SALAMANDER (Hydromantes brunus) RARE

DESCRIPTION: This salamander has webbed toes, a mushroom-like tongue with free margins, and a flattened body. Its color is uniformly brown above and pale brown to gray below. The underside of the tail is yellowish. The young are pale yellowish green above, changing with age through pale yellow to beige or brown. Adults grow to 76-102 mm (3-4 in).

DISTRIBUTION: Occurs in the vicinity of Briceburg and along Bear Creek, tributary to the Merced River, Mariposa County. It has also been found in Hell Hollow, about 6.4 km (4 mi) above Lake McClure, and at its confluence with Lake McClure. As its name indicates, this species is associated with limestone outcrops in the Digger pine-chaparral belt of the lower Merced River Canyon, living in crevices of cliffs and ledges of talus, especially where overgrown with moss.

STATUS: Rare. Numbers appear to be limited in the few locations where this species occurs. Retreats in the limestone bluffs may be critical, since the hot, dry summer weather makes this area marginal for salamanders.

ACTIONS:

... Take, possession, and sale prohibited by state law. Declared threatened by the Secretary of the Interior.

... Results of surveys by the Department of Fish and Game indicate that the habitat is in good condition.

RECOMMENDATIONS:

... Evaluate any proposed disturbance of the limestone outcrops at these localities to determine possible detrimental effects.

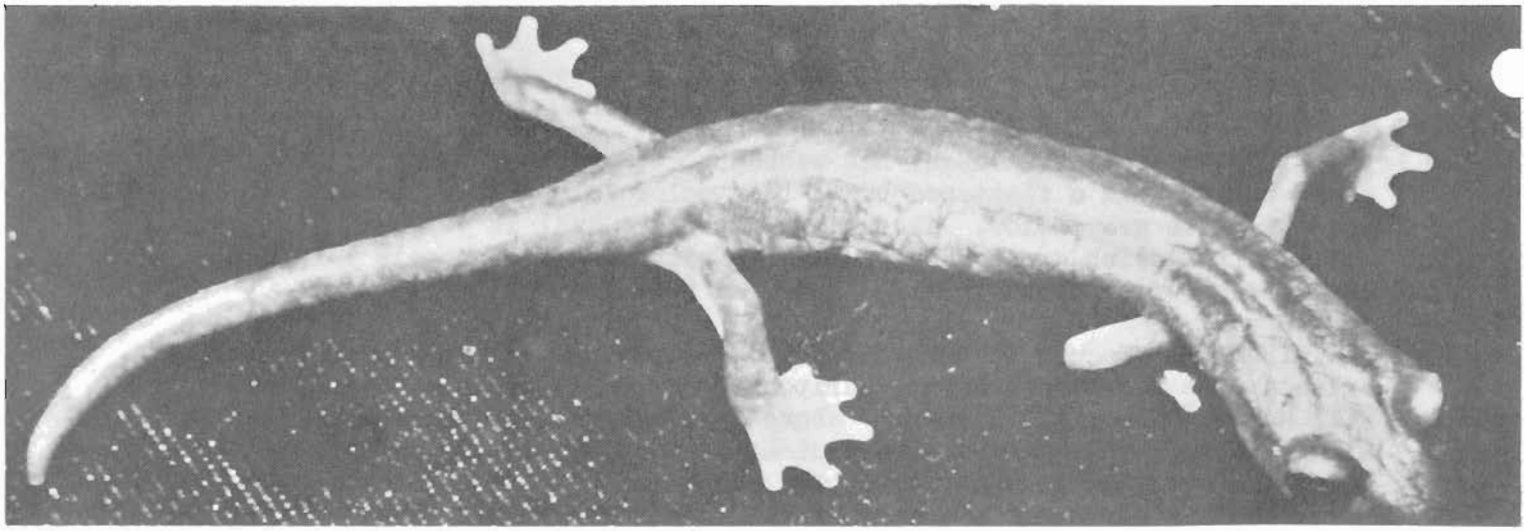
... Monitor Hell Hollow watershed for activities which might be detrimental to the stream flow or water quality.

... Continue investigations of adjacent areas to determine if this species is more widespread than presently known.

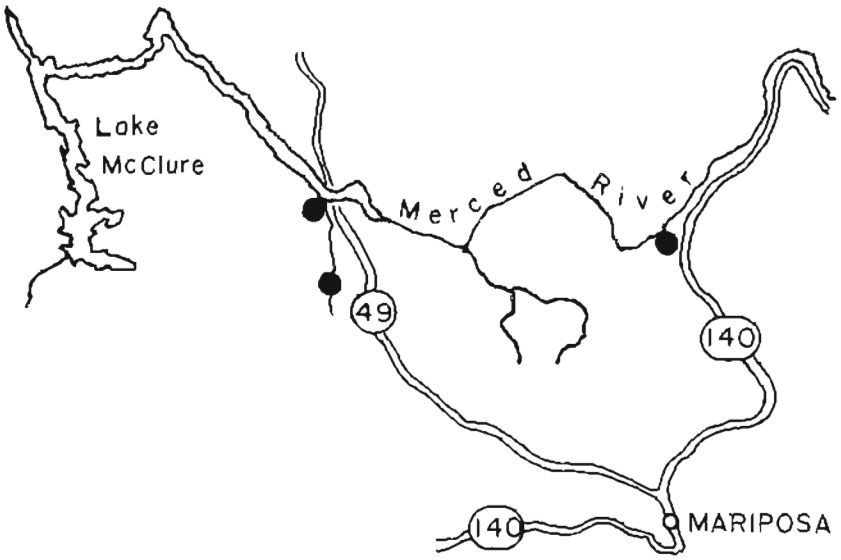
REFERENCES:

Gorman, J. 1954. A new species of salamander from central California. Herpetologica 10(4):153-159.

Limestone Salamander



Arden H. Brame, Jr.



SHASTA SALAMANDER (Hydromantes shastae) RARE

DESCRIPTION: This species is very similar to the limestone salamander, except that the coloration on the dorsal side is gray-green, beige, tan, or reddish, and usually with yellow on the tail. The ventral surface is dark with white flecks or blotches. The young are gray-green, olive, tan, or reddish on the body and yellowish on the tail. Adults grow to 76-102 mm (3-4 in).

DISTRIBUTION: Inhabits limestone formations in several areas on the northern side of Shasta Lake, between the McCloud and Pit River arms. They are found in moist limestone fissures and caves, and under rocks in the open during wet weather in mixed pine-hardwood stands.

STATUS: Rare. This species appears to be present in limited numbers in the few known localities associated with limestone outcrops.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared threatened by the Secretary of the Interior and rare by the International Union for Conservation of Nature and Natural Resources.

RECOMMENDATIONS:

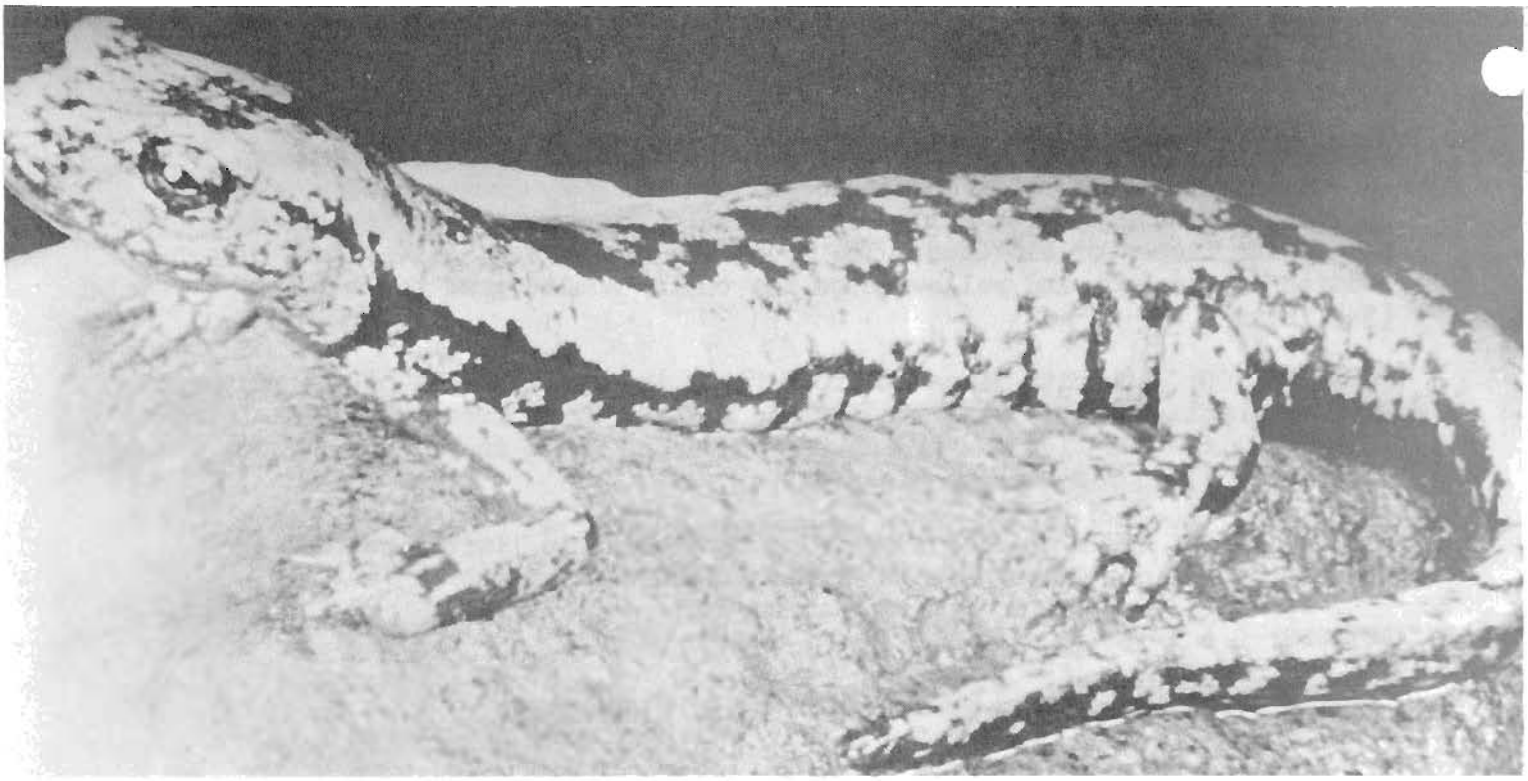
... Establish a Federal Research Natural Area in the Hosselkus Limestone Formation. This would protect a portion of the range of this species under jurisdiction of the U. S. Forest Service.

REFERENCES:

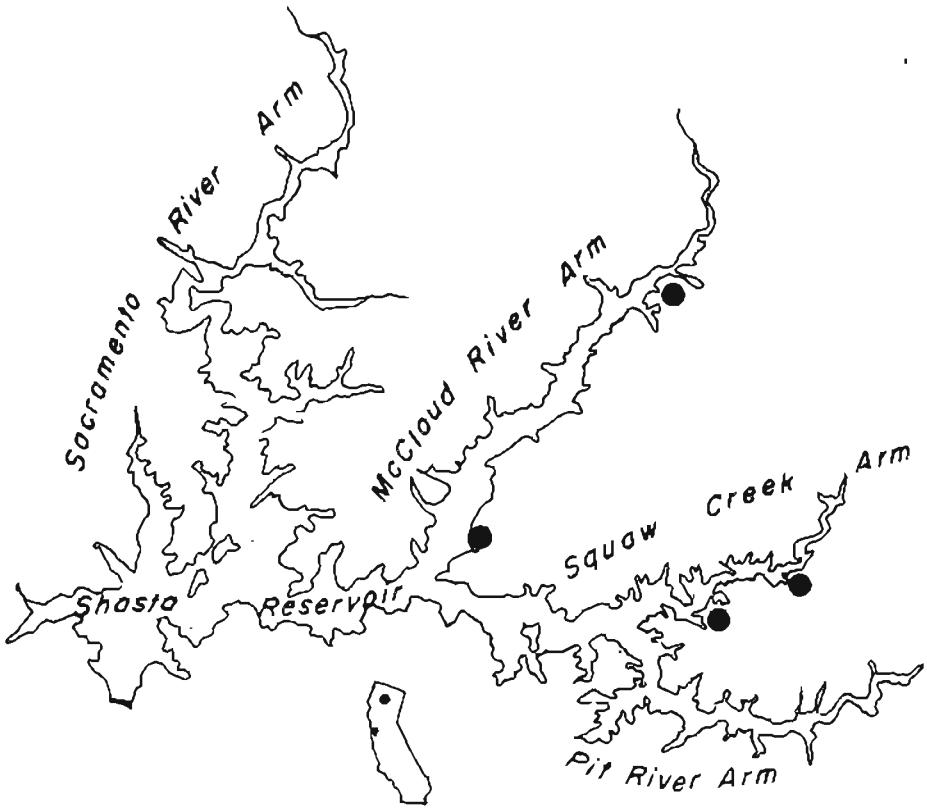
Bury, R. B., G. M. Fellers, and S. B. Ruth. 1969. First records of Plethodon dunni in California, and new distributional data on Ascapus truei, Rhyacotriton olympicus, and Hydromantes shastae. Herpetol. 3(3-4):157-161.

Gorman, J. and C. L. Camp. 1953. A new species of salamander of the genus Hydromantes from California, with notes on habits and habitat. Copeia 1953(1):39-43.

Shasta Salamander



Nathan W. Cohen



KERN CANYON SLENDER SALAMANDER (Batrachoseps simatus) RARE

DESCRIPTION: Slender salamanders are rather small and wormlike with minute limbs. This species has relatively long limbs and tail and a narrow head. All feet have 4 toes. Color is black on the sides and ventral surface. Dorsal surface has dashes and patches of bronze and light reddish-brown pigment which may form an imperfect dorsal band. Adults grow to 114-127 mm (4½-5 in).

DISTRIBTUION: Kern River Canyon from about Democrat Hot Springs downstream to Live Oak Picnic Area, and near Fairview above Lake Isabella. These salamanders occur beneath pine, oak, and fallen chaparral logs, as well as large rocks and talus, on rather steep north-facing slopes.

STATUS: Rare. This species occurs in small numbers throughout its restricted range.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared rare by the International Union for Conservation of Nature and Natural Resources.

... Results of surveys by the Department of Fish and Game indicate that the habitat is in good condition.

RECOMMENDATIONS:

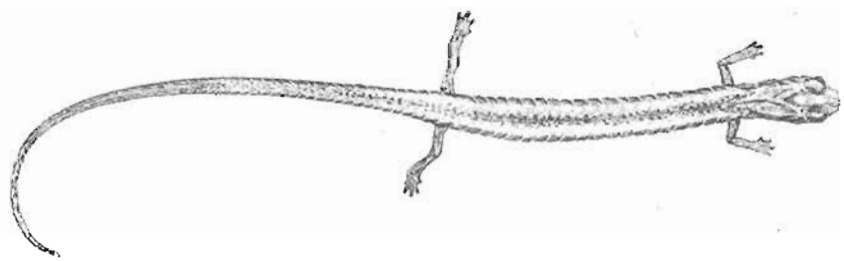
... Design future road construction in Kern River Canyon so as to minimize damage to the habitat of this species.

....Investigate additional areas in the Kern River Canyon to determine if this species is more widespread than presently known.

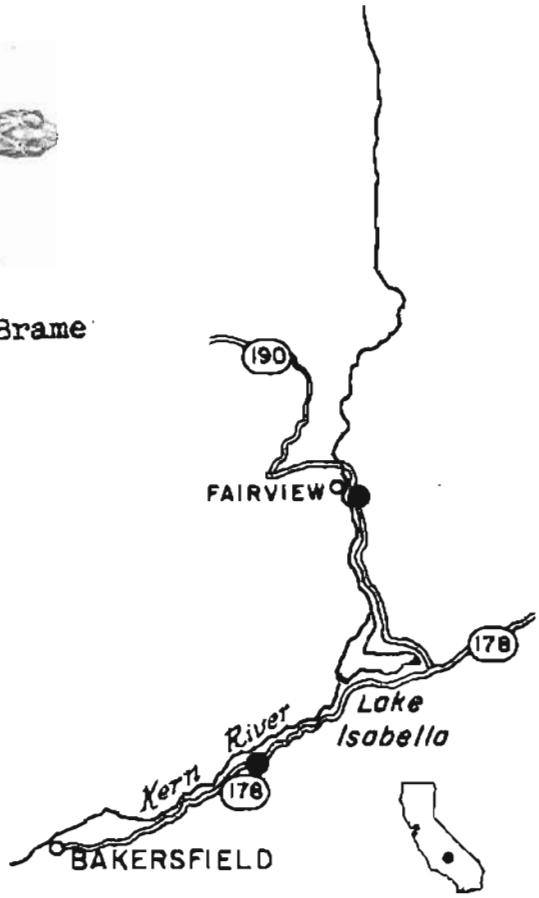
REFERENCES:

Brame, A. H., Jr., and K. F. Murray. 1968. Three new salamanders (Batrachoseps) with a discussion of relationships and speciation within the genus. Bull. L. A. Co. Mus. Nat. Hist. Sci. 4:1-35.

Kern Canyon Slender Salamander



Patricia L. Brame



TEHACHAPI SLENDER SALAMANDER (Batrachoseps stebbinsi) RARE

DESCRIPTION: This is a large, robust member of the genus Batrachoseps. It is distinguished by its relatively large feet and long legs. Dorsal color is dark, with dark red, brick red, light or dark brown, or light beige patches and blotches, sometimes forming an indistinct band. The sides and tail are deep black. The ventral surfaces are dark gray-black. Adults grow to about 127 mm (5 in).

DISTRIBUTION: It has been collected from 5 small areas in the Piute and Tehachapi mountains east of Bakersfield, Kern County, and from one locality in Tulare County. The area in the Tehachpis along State Highway 58 was damaged by freeway construction. This species lives in rock talus in foothill woodland and riparian vegetation.

STATUS: Rare. This salamander occurs in small numbers in a very restricted range.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Declared threatened by the Secretary of the Interior, and rare by the International Union for Conservation of Nature and Natural Resources.

... Results of surveys by the Department of Fish and Game indicate that the remaining habitat is in good condition.

RECOMMENDATIONS:

... Carefully plan any future road construction or disturbance of slopes along the Lorraine-Bodfish road to prevent further damage to the habitat of this species.

... Contact the U. S. Army Corps of Engineers concerning the possible effect of any future flood control projects on the habitat of this salamander in Caliente Creek Canyon.

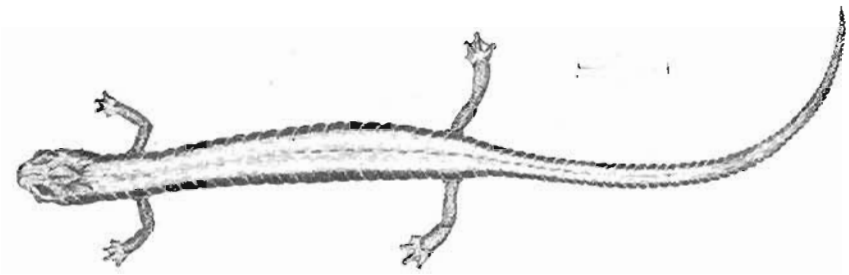
... Conduct additional investigations to determine if this species occurs in other areas of the Tehachapi, Piute, and Sierra Nevada mountains.

REFERENCES:

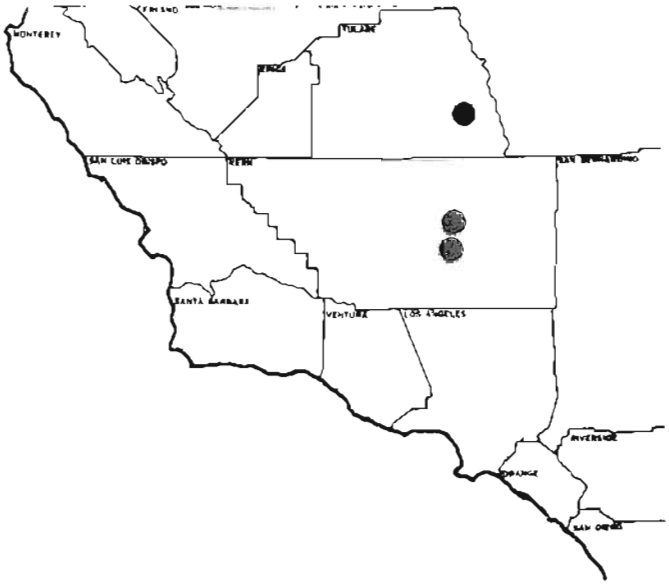
Brame, A. H., Jr., and K. F. Murray. 1968. Three new salamanders (Batrachoseps) with a discussion of relationships and speciation within the genus. Bull. L. A. Co. Mus. Nat. Hist. Sci. 4:1-35.

Richman, J. B. 1973. A range extension for the Tehachapi slender salamander, Batrachoseps stebbinsi. HISS News-Journal 1(3):97.

Tehachapi Slender Salamander



Patricia L. Brame



fishes . . .

MODOC SUCKER (Catostomus microps) RARE

DESCRIPTION: This is a small sucker, rarely reaching 35.6 cm (14 in), with a short, conical head. The eyes and scales are small. The body is grayish above to white on the belly. Three dark vertical blotches may appear on the sides of freshly-caught specimens. Spawning males have a distinct, red band on the sides, and are black on the back.

DISTRIBUTION: This species has been collected from Rush and Ash Creeks, Modoc and Lassen counties, and Dorris Reservoir near Alturas.

STATUS: Rare. (New to list). The distribution of this species is apparently restricted, but fish seem abundant where present. Potential threats are from hybridization with the western sucker (Catostomus occidentalis), channelization, and competing uses of water.

ACTIONS:

... Take, possession, and sale prohibited by state law.

... Designated as endangered by the International Union for Conservation of Nature and Natural Resources.

... A cooperative study of the distribution, abundance, and habitat requirements of this species was undertaken in 1973 by the California Department of Fish and Game and the University of California at Davis.

RECOMMENDATIONS:

... Prevent stream channel alteration and dewatering of those streams where it is found.

... Extend its range into other suitable waters in the Upper Pit River drainage.

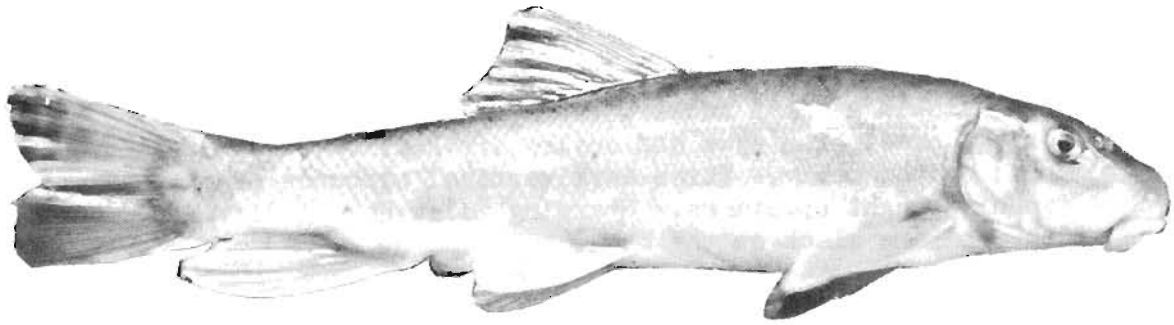
REFERENCES:

Martin, Michael. 1972. Morphology and variation of the Modoc sucker, Catostomus microps Rutter, with notes on feeding adaptations. Calif. Fish Game 58(4):277-284.

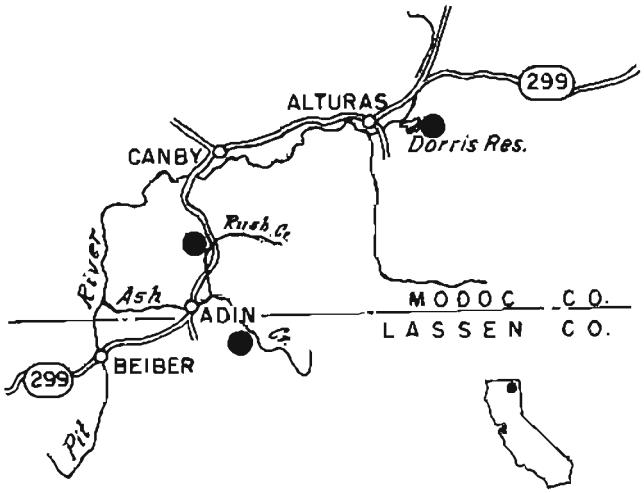
Miller, R. R. 1961. Man and the changing fish fauna of the American southwest. Pap. Mich. Acad. Sci. Arts Let. 46(1960):364-404.

Rutter, C. 1908. The fishes of the Sacramento-San Joaquin basin, with a study of their distribution and variation. Bull. U. S. Bur. Fish. 27(1907):103-152.

Modoc Sucker



Leonard Fisk



ROUGH SCULPIN (Cottus asperrimus) RARE

DESCRIPTION: This is a slender sculpin that is olive brown to purplish above, with sides finely mottled with dusky and gray, the dusky color making 4-5 blotches. The ventral surface is speckled. Ventral fins are colorless, but the others are barred. Lateral line does not extend beyond the base of the third from last dorsal ray. Dense prickles extend from pectoral fin back along body above the lateral line to a location under the middle of the soft dorsal fin.

DISTRIBUTION: The rough sculpin is found in the Pit River only for a short distance above and below the falls in Shasta County. It has been taken in lower Hat Creek and in Fall River near the mouth and at Dana.

STATUS: Rare. (New to list). This fish appears to have a restricted distribution, and may be present in only limited numbers where it occurs. Little change in the habtiat is foreseen in this area in the near future.

ACTIONS:

... Take, possession, and sale prohibited by state law.

RECOMMENDATIONS:

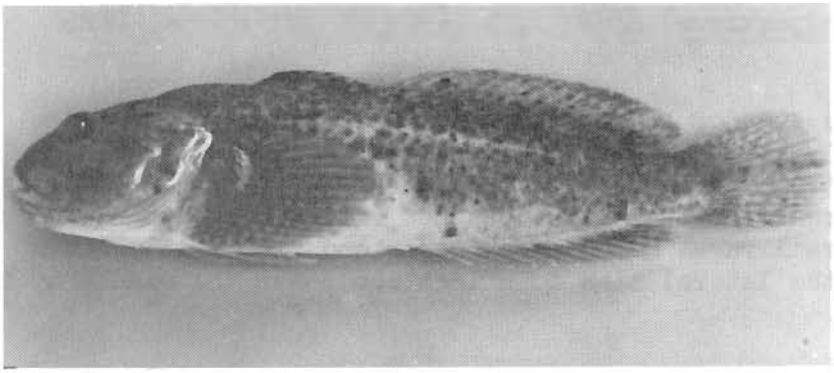
... Survey of Pit River and its tributaries to determine its abundance, distribution, and habitat requirements.

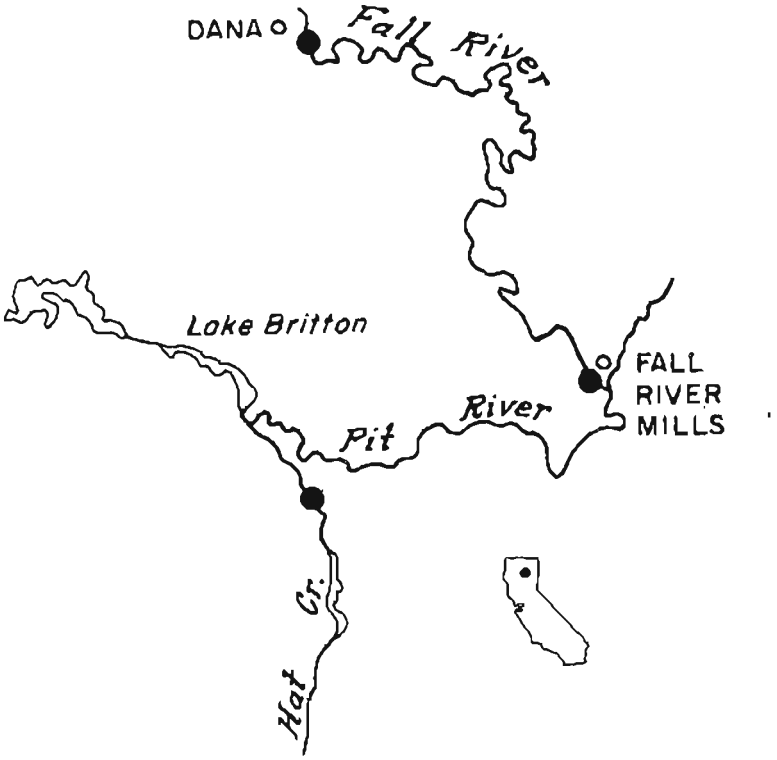
REFERENCES:

Robins, C. R. and R. R. Miller. 1957. Classification, variation, and distribution of the sculpins, genus Cottus, inhabiting Pacific slope waters in California and southern Oregon, with a key to the species. Calif. Fish Game 43(3):213-233.

Rutter, C. 1908. The fishes of the Sacramento-San Joaquin basin, with a study of their distribution and variation. Bull. U. S. Bur. Fish. 27(1907):103-152.

Rough Sculpin





COTTONBALL MARSH PUPFISH (*Cyprinodon milleri*) RARE

DESCRIPTION: This species is similar to other Death Valley pupfishes (*C. salinus*, *C. nevadensis*) in coloration and degree of sexual dimorphism. Individuals of both sexes have 7 or 8 vertical bars on the sides. The dorsal fin is blackened in males, and melanophore concentrations also occur at the distal margins of the pectoral, anal, and caudal fins. In females the caudal, anal, and pectoral fins are clear in life. This species is distinguished from other pupfishes by having a shorter and narrower caudal peduncle, more scales, and pelvic fins reduced or absent.

DISTRIBUTION: *C. milleri* is known only from Cottonball Marsh, Death Valley, California.

STATUS: Rare. (New to list). The small but stable population in Cottonball Marsh could easily be effected by any degredation of this extremely fragile habitat.

ACTIONS:

... Take, possession, and sale prohibited by state law.

RECOMMENDATIONS:

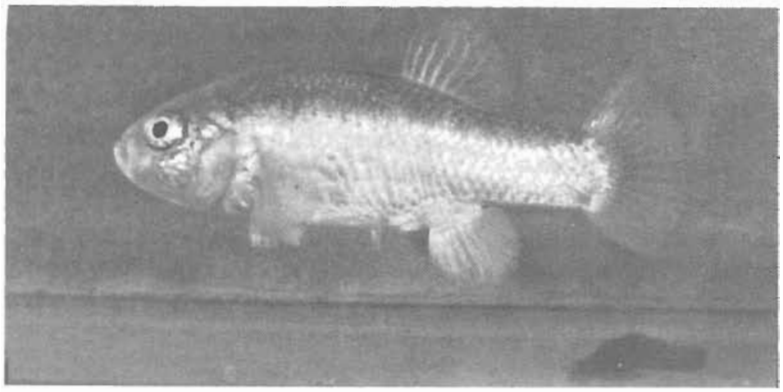
... Monitor population at Cottonball Marsh to keep abreast of any developments that may affect its well-being.

REFERENCES:

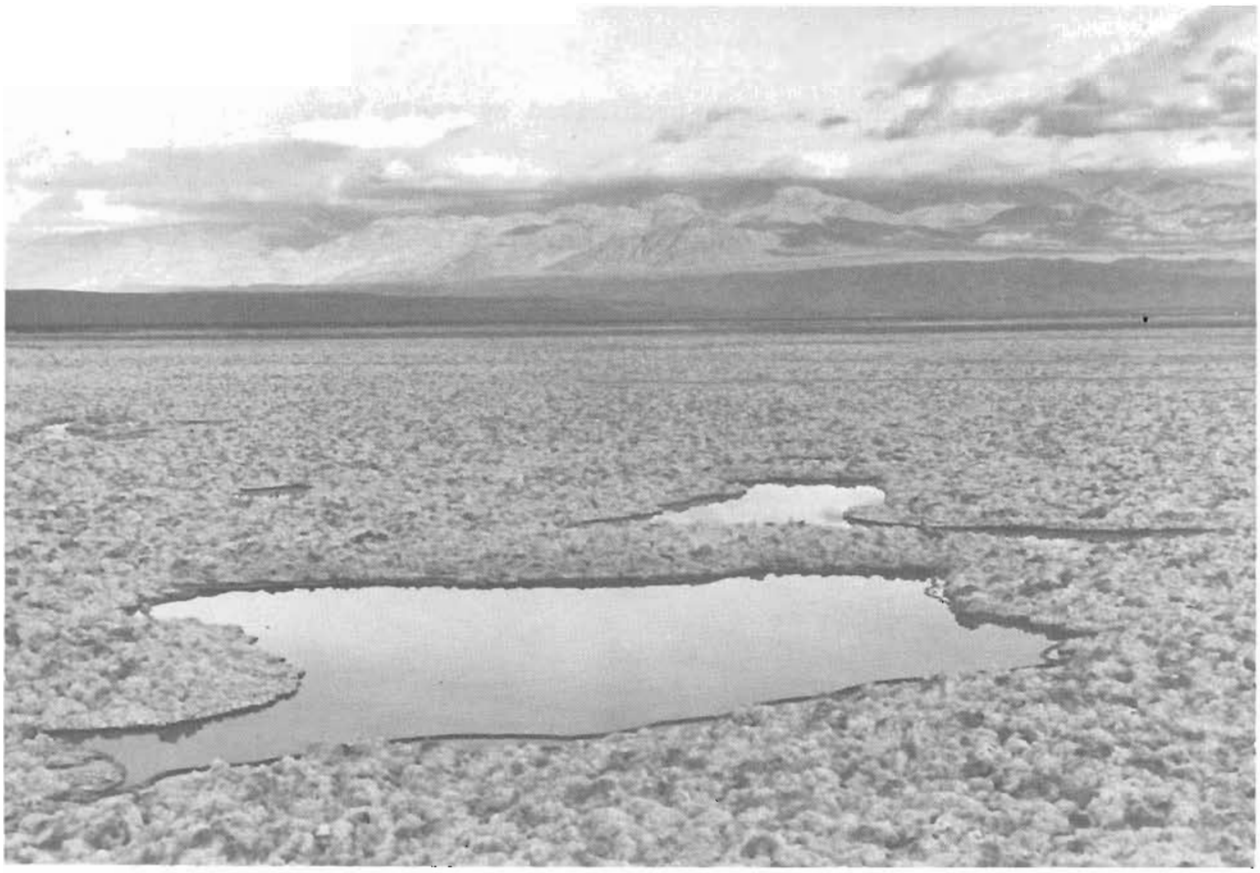
LaBounty, James F., and James E. Deacon. 1972. *Cyprinodon milleri*, a new species of pupfish (family Cyprinodontidae) from Death Valley, California. Copeia 1972(4):769-780.

Naiman, Robert J., Shelby D. Gerking, and Thomas D. Radcliff. 1973. Thermal environment of a Death Valley pupfish. Copeia 1973(2):366-369.

Cottonball Marsh Pupfish



Robert Naiman



Robert Naiman