FIVE YEAR STATUS REPORT

I. COMMON NAME: Blunt-nosed leopard lizard
SCIENTIFIC NAME: Gambelia silus
CURRENT CLASSIFICATION: Endangered

II. RECOMMENDED ACTION:

Retain Endangered classification.

III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

The blunt-nosed leopard lizard (BNLL) has continued to decline throughout its range even though conservation efforts have increased in recent years. Conversion of habitat for agriculture, energy development, mineral extraction, and urban expansion is continuing, to the detriment of the BNLL.

SUPPORTING INFORMATION

IV. NATURE AND DEGREE OF THREAT:

Habitat loss, as a result of agricultural development in the San Joaquin Valley, is the principal cause of the decline of the BNLL (Stebbins 1954, Montanucci 1965, USFWS 1980, 1985a). Since the 1870's, and the advent of irrigated agriculture in the San Joaquin Valley, 94% of the formerly occurring wildlands have been destroyed or seriously altered. The cumulative effects of this dramatic loss of suitable habitat to agriculture and the additional modification and alteration of existing habitat by petroleum and mineral extraction, livestock grazing, pesticide application, and off-road vehicle use, have contributed to the decline of the BNLL.

Construction of facilities related to oil and natural gas production, such as well pads, wells, storage tanks, sumps, pipelines, and their associated service roads; leakage of oil from derricks, transport pipes, and storage facilities; dumping of waste oil and highly saline wastewater into natural drainage systems; surface mining; and off-road vehicle traffic degrade habitat (Madrone Associates 1979, Chesemore 1980, Mullen 1981, USFWS 1985a, Kato and O'Farrell 1986). Direct mortality occurs when BNLL (or nest chambers) are destroyed during construction, killed by vehicle traffic on access roads, drowned or mired in pools of oil (Montanucci 1965, Mullen 1981, Kato and O'Farrell 1986, Kato et al, 1987a) and uncovered oil cellars, or fall into excavated areas from which they are unable to escape (O'Farrell and Sauls 1987).

Overgrazing by domestic livestock results in removal of vegetation and shrub cover, destruction of rodent burrows used by BNLL for shelter, and associated soil erosion and stream siltation problems (Chesemore 1981, Williams and Tordoff 1988). Unlike cultivation of row crops, which precludes use by BNLL, light grazing may be beneficial (Chesemore 1980, USFWS 1985a).

The use of pesticides may directly and indirectly affect BNLL (Montanucci 1965, Williams and Tordoff 1988). The insecticide, malathion, has been used since 1969 by the California Department of Food and Agriculture (CDFA) to control the sugar beet leafhopper (Circulifer tenellus), a vector of the curly top virus that infects sugar beets, tomatoes, melons, peppers, beans, cucumbers, and other crops (CDFA 1984). Prior to 1969, treatment was accomplished using DDT. Montanucci (1965) reported that entomologists found dead BNLL in the Blackwell's Corner area of Kern County, subsequent to insecticide treatment.

Although the acute and chronic effects of malathion toxicity to BNLL are unknown, Hall and Clark (1982) found that acute oral administration of malathion was relatively non-toxic to another iguanid lizard. The most important effects of malathion on the BNLL may be those associated with the temporary reduction of insect prey populations (CDFA 1984). Because it degrades in approximately 48 hours, the effect of this insecticide on the abundance of prey species is thought to last for two to five days (CDFA 1984). Aerial application of malathion may reduce the availability of food for BNLL in the spring (March-May) and in October, when they are building up fat reserves to sustain themselves during the winter.

Fumigants, such as the rodenticide methyl bromide, are used to control ground squirrels. Since BNLL often inhabit abandoned ground squirrel burrows, they may be inadvertently poisoned. The use of poisoned baits (grain etc.) may reduce rodent populations, thereby reducing the availability of burrows for BNLL.

Finally, BNLL mortality is known to occur as a result of regular automobile traffic and off-road vehicle use (Tollestrup 1979b, Williams and Tordoff 1988). Little information is available regarding the relative effect of this cause of mortality.

V. HISTORIC AND CURRENT DISTRIBUTION:

Historic

The BNLL is endemic to the San Joaquin Valley of central California (Stejneger 1893, Smith 1946, Montanucci 1965, 1970, Tollestrup 1979a). Although the limits of its original distribution are uncertain, the BNLL is thought to have occurred as far north as Stanislaus County and as far south as the Tehachapi Mountains in Kern County (Figure 1).

Historically, the BNLL distribution extended into the Carrizo Plain and Cuyama Valley, the foothills of the Sierra Nevada, and the foothills of the Coast Range Mountains. BNLL are not found above 792 m (2,600 ft) in elevation (Montanucci 1970).

Current

The distribution of the BNLL has been drastically reduced in the San Joaquin Valley and Sierra Nevada foothills, and, based on California Department of Fish and Game (CDFG) surveys, is now limited to scattered parcels of undeveloped land (Figure 2). In the foothills of the Coast Range, including the Panoche Hills and the Carrizo Plain, the BNLL still occupies much of its historic range. In the San Joaquin Valley, BNLL populations are known to occur in the Firebaugh, Madera, Pixley Refuge, Liberty Farms, Allensworth, Kern Refuge, Antelope Plain, Buttonwillow, Elk Hills, and Tupman habitat areas and north of Bakersfield on Poso Creek. Remaining undeveloped lands that likely support BNLL populations include the Lone Tree, Sandy Mush Road, Caliente Creek, and Kettleman Hills habitat areas (CDFG 1985).

VI. HISTORIC AND CURRENT ABUNDANCE:

Early descriptions of the BNLL contain no estimates of population size or density (Stejneger 1890, 1893). Although there are no current overall population size estimates for the species, Uptain et al. (1985) reported densities ranging from 0.12 to 4.2 BNLL/acre for a population on the Pixley National Wildlife Refuge in Tulare County. In a previous study of this population, Tollestrup (1979b) estimated an average density of 1.3 BNLL/acre. Turner et al. (1969) estimated that the average density of a southern Nevada population of the long-nosed leopard lizard (G. wislizenii) was

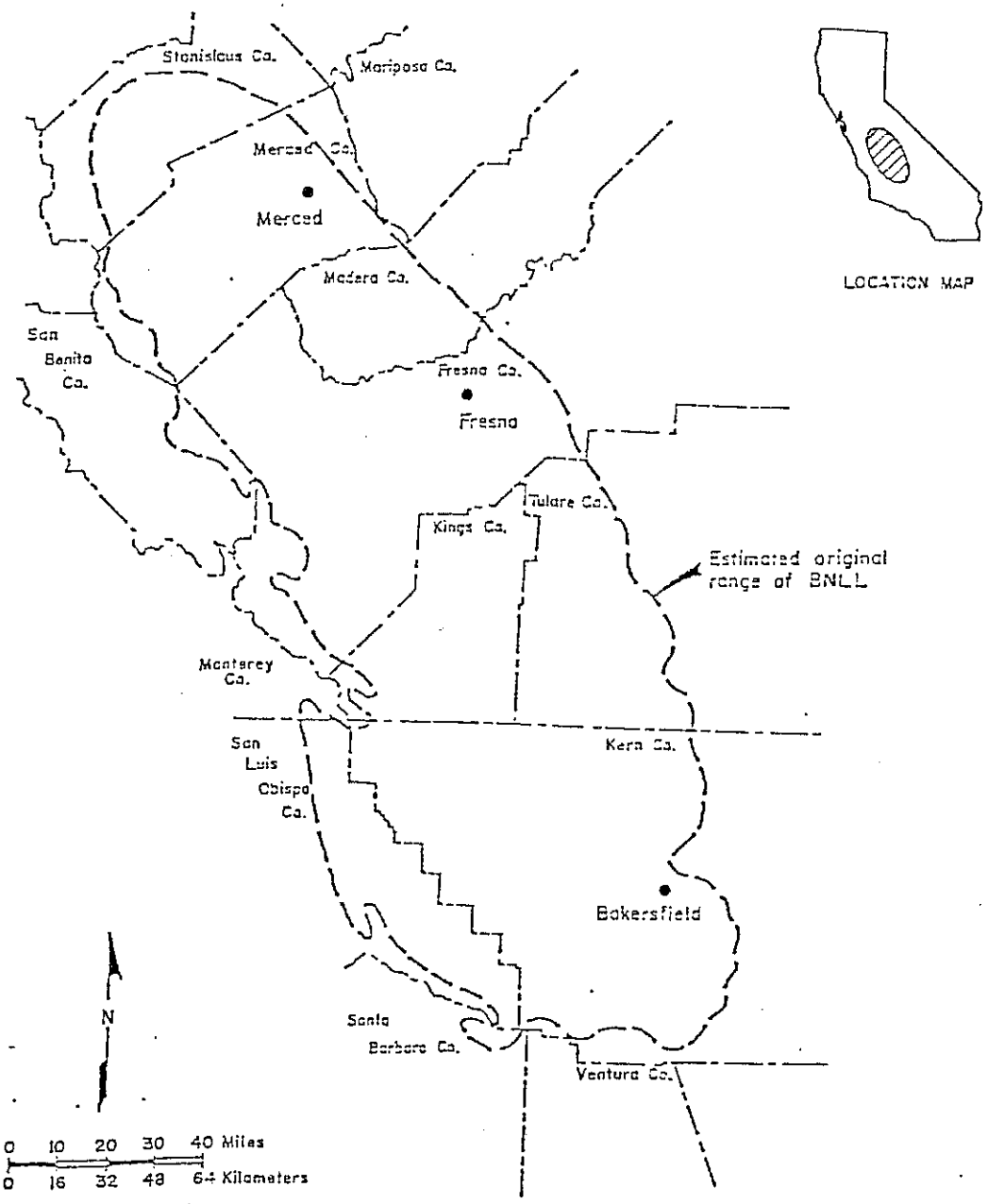
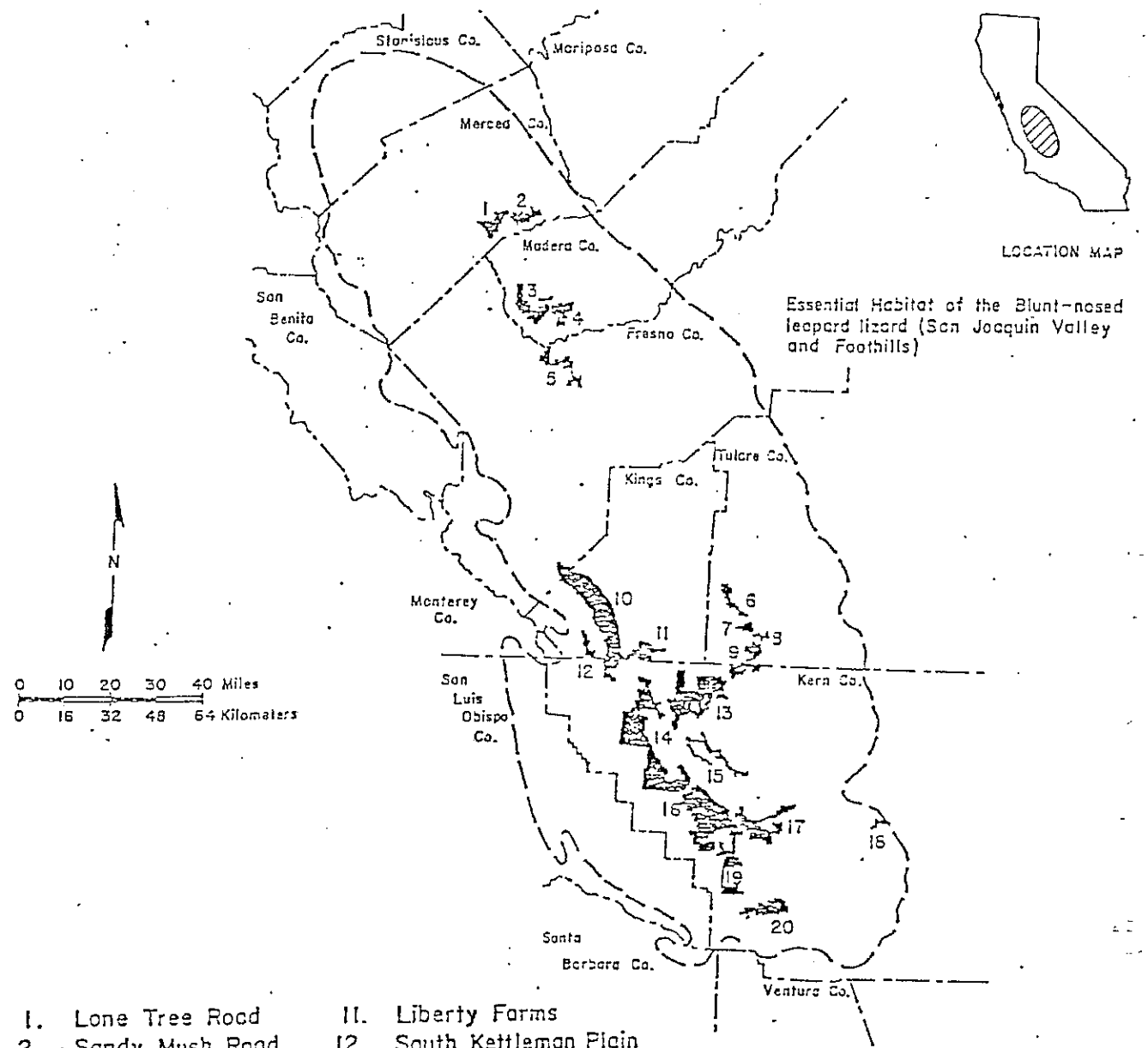


Figure 1. Historical range of the blunt-nosed leopard lizard, San Joaquin Valley, California (adapted from Montanucci 1965).



1. Lone Tree Road
2. Sandy Mush Road
3. Firebaugh
4. Madera
5. Whitesbridge
6. Horse Pasture
7. Pixley Refuge
8. Earlimart
9. Allensworth
10. Kettleman Hills
11. Liberty Farms
12. South Kettleman Plain
13. Kern Refuge
14. Antelope Plain
15. Buttonwillow
16. Elk Hills
17. Tupman
18. Caliente Creek
19. Taft
20. San Emigdio

Figure 2. Habitat of the blunt-nosed leopard lizard in the San Joaquin Valley, 1984-85 (California Department of Fish and Game, 1985)..

1.2 lizards/acre. Population densities in marginal habitat generally do not exceed 0.2 BNLL/acre (LeFevre 1976, Madrone Associates 1979, Mullen 1981).

Given the large amount of habitat loss, the total number of BNLL is certainly much less than it was historically. However, densities of populations that persist in good habitat probably have not changed appreciably.

VII. SPECIES DESCRIPTION AND BIOLOGY:

The BNLL is a relatively large lizard with a long, regenerative tail; long, powerful hind limbs; and a short, blunt snout (Smith 1946, Stebbins 1985). Males are significantly larger than females, ranging in size from 87 to 120 mm (3.4 to 4.7 inches) snout-vent length (Tollestrup 1982). From snout to vent, females are 86 to 111 mm long (3.4 to 4.4 inches). Adult males weigh 32 to 53 g and adult females weigh 21 to 36 g (Uptain et al. 1985, Williams et al. 1989). Males are distinguished from females by their enlarged postanal scales, femoral pores, temporal and mandibular muscles, and tail base (Montanucci 1965).

Background color ranges from yellowish to light gray-brown to dark brown depending on the surrounding soil color and vegetational association (Smith 1946, Montanucci 1965, 1970, Stebbins 1985). The ventral surface is uniformly white. The dorsal color pattern consists of longitudinal rows of dark spots interrupted by a series of 7 to 10 white, cream-colored, or yellow transverse bands. The crossbands are much broader and more distinct than in other leopard lizards and extend from the lateral folds on each side to the middle of the back, where they meet or alternate along the dorsal midline. With increasing age the crossbands may fade and the spots may become smaller and more numerous. The BNLL can be distinguished from the long-nosed leopard lizard by the presence of dark gular blotches, instead of parallel streaks, on the ventral surface of the throat.

Postnuptial BNLL females develop a single row of bright orange-red blotches on the sides below the lateral folds and often this coloring also appears on the head and underside of the thighs and tail. After the eggs are laid the breeding color fades to pink or light orange. The ventral surface of the body and limbs of males is covered with a bright salmon or rusty-red color during, or subsequent to, breeding.

In late March or early April, BNLL emerge from hibernation underground (Tollestrup 1979b). Courtship and breeding

typically begin at the end of April and may extend to the middle of August (Montanucci 1967, Tollestrup 1983). Males mate with several females and aggressively defend a breeding territory against other males (Montanucci 1965, 1967, Tollestrup 1979b, 1983). Male and female home ranges often overlap. The mean home range size varies from 0.25 to 2.7 acres for females and 0.52 to 4.2 acres for males (Tollestrup 1983, Kato et al. 1987a).

The timing and success of reproduction is affected by local climatic conditions and food availability. Tollestrup (1982) found that the reproductive season was shortened in a drought year and Kato et al. (1987a) noted that reproduction did not occur at all in one year. Oviposition generally occurs from late May to early July, although it may be delayed until August under unfavorable conditions (Montanucci 1965, Tollestrup 1979b, 1982). The large white eggs are laid in rodent burrows at the end of a shallow tunnel that the BNLL digs into the ground at a 45-degree angle (Montanucci 1965, Tollestrup 1979b, 1982).

BNLL are opportunistic in their feeding habits and their diet varies according to season and geographic location (Montanucci 1965, Tollestrup 1979b). Their foraging strategy combines active stalking of prey with sit-and-wait tactics. The diet consists primarily of insects, but occasionally small lizards may be eaten. Vegetative material and rocks also have been found in stomach samples. Kato et al. (1987b) found that the diet of a population in Buena Vista Valley, in the southwestern foothills of the San Joaquin Valley, consisted of 54.5% grasshoppers and crickets, 18.2% wasps and bees, 16.7% true bugs, 4.5% beetles, 1.5% ants, and 4.5% lizards. Lizard species which are taken as prey include: side-blotched lizards (Uta stansburiana), coast horned lizards (Phrynosoma coronatum), California whiptails (Cnemidophorus tigris mundus), desert spiny lizards (Sceloporus magister), and other BNLL (Montanucci 1965).

Montanucci (1965) and Tollestrup (1979b) have listed several potential BNLL predators. These include: San Joaquin whipsnakes (Masticophis flagellum ruddocki), Pacific gopher snakes (Pituophis melanoleucus catenifer), California glossy snakes (Arizona elegans occidentalis), western long-nosed snakes (Rhinocheilus lecontei lecontei), California king snakes (Lampropeltis getulus californiae), northern Pacific rattlesnakes (Crotalus viridis oreganus), loggerhead shrikes (Lanius ludovicianus), American kestrels (Falco sparverius), burrowing owls (Speotyto cunicularia), roadrunners (Geococcyx californianus), golden eagles (Aquila chrysaetos), various hawks, California ground squirrels

(Spermophilus beecheyi beecheyi), spotted (Spilogale putorius) and striped skunks (Mephitis mephitis), badgers (Taxidea taxis), coyotes (Canis latrans), and San Joaquin kit foxes (Vulpes macrotis mutica). BNLL are hosts to endoparasites, such as nematodes and ectoparasites, such as mites and harvest mites (Montanucci 1965). Because they have similar diets, Montanucci (1965) and Tollestrup (1979b) considered it likely that interspecific competition occurs between the BNLL and the California whiptail.

VIII. HABITAT REQUIREMENTS:

The BNLL inhabits open, sparsely vegetated areas of low relief on the San Joaquin Valley floor and in the surrounding foothills (Smith 1946, Montanucci 1965). On the valley floor, this species is most commonly found in the Valley Sink Scrub Natural Community described by Holland (1986). The Valley Sink Scrub is dominated by low, alkali-tolerant shrubs of the family Chenopodiaceae, such as Allenrolfea occidentalis (iodine bush), Suaeda fruticosa, and S. torreyana (seep-weed).

The soils are saline and alkaline lake bed or playa clays that often form a white salty crust and are occasionally covered by introduced annual grasses (Bromus rubens). Prior to agricultural development and the resulting diversion of water through flood control and ground-water pumping, Valley Sink Scrub was widespread around Kern, Buena Vista, Tulare, and Goose Lakes and extended north to the Sacramento Valley along the trough of the San Joaquin Valley. This community corresponds to two that Tollestrup (1976) described as Allenrolfea grassland and Sueda flat.

BNLL use small rodent burrows for shelter from predators and temperature extremes and for egg laying (Tollestrup 1979b). Burrows are usually abandoned ground squirrel tunnels or occupied or abandoned kangaroo rat tunnels (Montanucci 1965). Each lizard uses several burrows without preference, but will avoid those occupied by predators or other leopard lizards. Montanucci (1965) found that in areas of low mammal burrow density, lizards will construct shallow, simple tunnels in earth berms or under rocks. While foraging, immature BNLL also take cover under shrubs and rocks.

IX. CURRENT AND RECOMMENDED MANAGEMENT:

The CDFG presently owns about 4,587 acres, divided among five Ecological Reserves, which provide, in part, habitat

for the BNLL. Management plans are being developed for these areas that will address the BNLL as well as other wildlife resources.

The Department is coordinating with the Bureau of Land Management, the Nature Conservancy and the Fish and Wildlife Service in developing a large reserve on the Carrizo Plain that encorporates BNLL habitat.

Additional BNLL habitat occurs on Federal lands (e.g. Pixley National Wildlife Refuge) and some Nature Conservancy lands. Although BNLL populations on these lands are protected by virtue of ownership, no specific management plans or actions are presently being implemented.

X. INFORMATION SOURCES:

California Department of Fish and Game. 1985. Blunt-nosed leopard lizard essential habitat update, July 1, 1984-September 30, 1985. Calif. Dept. Fish and Game, Job EF84 II-1, Sacramento, CA. 22 p.

California Department of Food and Agriculture. 1984. Environmental assessment of curly top virus control in California, 1984-1989. Curly Top Virus Mgmt. Prog., Sacramento, CA. 68 p.

Chesemore, D.L. 1980. Impact of oil and gas development on blunt-nosed leopard lizards. Final Rept. Contract No. YA-512-CT9-118. U.S. Bureau of Land Management, Bakersfield, CA. 83 p.

_____. 1981. Blunt-nosed leopard lizard inventory final report. Contract No. YA-553-CTO-51. U.S. Bureau of Land Management, Bakersfield, CA. 143 p.

Hall, R.J., and D.R. Clark. 1982. Responses of the iguanid lizard Anolis carolinensis to four organophosphorus pesticides. Env. Pollution (Series A) 28(1982): 45-52.

Holland, R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Calif. Dept. Fish and Game, Sacramento, CA. 156 p.

Kato, T.T., and T.P. O'Farrell. 1986. Biological assessment of the effects of petroleum production at maximum efficient rate, Naval Petroleum Reserve #1 (Elk Hills), Kern Conty, California, on the endangered blunt-nosed leopard lizard, Gambelia silus. U.S. Dept. Energy Topical Rept., EG&G/EM Santa Barbara Operations Rept. No. EGG 10282-2108. 63 p.

Kato, T.T., B.R. Rose, and T.P. O'Farrell. 1987a. Distribution, abundance, and habitat use of the endangered blunt-nosed leopard lizard on the Naval Petroleum Reserves, Kern County, California. U.S. Dept. Energy Final Rept., EG&G/EM Santa Barbara Operations Rept. No. EGG 10282-2185. 44 p.

_____. 1987b. Diet of the blunt-nosed leopard lizard, Gambelia silus on Naval Petroleum Reserves #1 and #2, Kern County, California. U.S. Dept. Energy Final Rept., EG&G/EM Santa Barbara Operations Rept. No. 10282-2188. 16 p.

Le Fevre, M. 1976. 1976 leopard lizard census summary. U.S. Forest Service, Mt. Pinos Ranger District, Los Padres National Forest. 13 p.

Madrone Associates. 1979. Liquid products pipeline, storage and railroad loading facility (Department of Energy project 12) biological assessment, blunt nosed leopard lizard (Crotaphytus [=Gambelia] silus), Naval Petroleum Reserve No. 1 (Elk Hills), Kern County, California. Final Project Rept. U.S. Navy, San Bruno, Ca. 60 p. + Appendices.

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

_____. 1967. Further studies on leopard Lizards, Crotaphytus wislizenii. Herpetologica 23(2): 119-126.

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

Mullen, R.K. 1981. Elk Hills endangered species program. Environemntal assessment of the blunt-nosed leopard lizard, Crotaphytus silus, Phase 2, 1980. U.S. Dept. Energy Topical Rept. EG&G/EM Santa Barbara Operations Rept. No. EGG 1183-2417. 45 p.

O'Farrell, T.P. and M.L. Sauls. 1987. Biological survey of Naval Petroleum Reserve #2 (Buena Vista), Kern County, California. U.S. Dept. Energy Topical Rept., EG&G/EM Santa Barbara Operations Rept. No. 10282-2166. 51 p. + Appendices.

Smith, H.M. 1946. Handbook of lizards. Comstock Publishing Co., Inc., Ithaca, New York. 557 p.

Stebbins, R. C. 1954. Amphibians and reptiles of western North America. McGraw-Hill Book Co., Inc., New York. 536 p.

_____. 1985. A field guide to western reptiles and amphibians. Second Edition. Houghton Mifflin Company, Boston. 336 p.

Stejneger, L. 1890. Annotated list of reptiles and batrachians, with descriptions of new species. North Amer. Fauna 3: 103-118.

_____. 1893. Annotated list of the reptiles and batrachians collected by the Death Valley Expedition in 1891, with description of new species. North Amer. Fauna 7: 159-228.

Tollestrup, K. 1979a. Distribution of Gambelia silus (blint-nosed leopard lizard) in the western foothills of the San Joaquin Valley. Unpub. Rept. U.S. Bureau of Land Management, Sacramento, CA. 18 p.

_____. 1979b. The ecology, social structure, and foraging behavior of two closely related species of leopard lizards, Gambelia silus and Gambelia wislizenii. Ph.D. dissertation. University of California, Berkeley. 146 p.

_____. 1982. Growth and reproduction in two closely related species of leopard lizards, Gambelia silus and Gambelia wislizenii. Amer. Midl. Nat. 108(1): 1-20.

_____. 1983. The social behavior of two closely related leopard lizards, Gambelia silus and Gambelia wislizenii. J. Tierpsychol. 762: 307-320.

Turner, F.B., J.R. Lannom, P.A. Medica, and G.A. Hoddenbach. 1969. Density and composition of fenced populations of leopard lizards (Crotaphytus wislizenii) in Southern Nevada. Herpetologica 25(4): 247-257.

U.S. Fish and Wildlife Service. 1980. Blunt-nosed leopard lizard recovery plan. U.S. Fish and Wildl. Serv., Portland, OR. 61 p.

_____. 1985. Blunt-nosed leopard lizard revised recovery plan. U.S. Fish and Wildl. Serv., Portland, OR. 85 p.

Uptain, C., W.A. Clark, and S.J. Juarez. 1985. Mark-recapture population estimates and visitation indices for the blunt-nosed leopard lizard, Gambelia silus, at the Pixley National Wildlife Refuge. Contract Nos. 10181-9810-3(js) and 10181-4672-4. U.S. Fish and Wildl. Serv., Delano, CA. 79 p.

Williams, D.F., and W. Tordoff, III. 1988. Operations and maintenance schedule, Elkhorn Plain Ecological Reserve, San Luis Obispo County, California. Final Report for Calif. Dept. Fish and Game, Sacramento, CA. Unpubl. 71 p.

Williams, D.F., D.J. Germano, and W. Tordoff III. 1989. Effects of livestock grazing on an endangered community dominated by giant Kangaroo rats (Dipodomys ingens). Report for Contract FG-8391, Part I. Calif. Dept. Fish and Game, Sacramento. Unpubl. 32 p.

XI. REPORT PREPARED BY:

John M. Brode, Associate Fishery Biologist
California Department of Fish and Game
Inland Fisheries Division
Endangered Species Project
July 1, 1990

XII. REVIEW COPIES SENT TO:

Mr. Dick Anderson
California Energy Commission
3600 Ashe Road, Apt. 17
Bakersfield, CA 93309

Mr. Randy Benthin, Associate Fishery Biologist
California Department of Fish and Game, Region 3
2201 Garden Road
Monterey, CA 93940

Mr. Dan Christenson
California Department of Fish and Game, Region 4
P.O. Box X, Kernville, CA 93238

Mr. Almo Cordone, Fisheries Management Supervisor
California Department of Fish and Game
Inland Fisheries Division
1416 Ninth Street
Sacramento, CA 95814

Mr. Gail Kobetich, Assistant Field Supervisor
U.S. Fish and Wildlife Service
2800 Cottage Way, Room 1823
Sacramento, CA 95825

Mr. Steve Nicola, Coordinator
Lands and Natural Areas Program
Natural Heritage Division
California Department of Fish and Game
1416 Ninth Street
Sacramento, CA 95814

Mr. Ron Rempel
California Department of Fish and Game, Region 4
1234 E. Shaw Avenue
Fresno, CA 93710

Dr. Dan Williams
Department of Biological Sciences
California State University, Stanislaus
Turlock, CA 95380