

## FIVE YEAR STATUS REPORT

I. COMMON NAME: Black Toad  
SCIENTIFIC NAME: Bufo exsul  
CURRENT CLASSIFICATION: Threatened

## II. RECOMMENDED ACTION:

Maintain Threatened classification.

## III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

The black toad (BT) has an extremely restricted range and occurs primarily on private property owned by Deep Springs College (DSC). Until a Memorandum of Understanding is developed and implemented between the Department of Fish and Game (DFG) and DSC for cooperative management of the toad habitat, threatened designation is justified. Any reduction in its range or modification of its habitat could cause the BT to become endangered.

## IV. NATURE AND DEGREE OF THREAT:

In 1971, the BT was listed as Rare by the California Fish and Game Commission. This classification was changed to Threatened upon enactment of the Endangered Species Act of 1984. It was listed primarily because of its small geographical range and specialized habitat. The welfare of the BT populations is dependent upon the water regime of the area, which is closely controlled by DSC.

Current cooperative management between the DFG and DSC provides protection for the major toad populations. In addition, in 1979 DFG purchased property adjacent to Deep Springs which prevents future development which might destroy the water source necessary to the existence of the BT.

Past collection pressure on this species has been effectively eliminated by listing the toad as Threatened and posting signs to that effect.

## V. HISTORIC AND CURRENT DISTRIBUTION:

Historic

This relict species has likely been isolated in Deep Springs Valley of eastern Inyo County since or prior to the end of the last pluvial event of the Pleistocene, some 12,000 ago. Deep Springs Valley is a desert basin with a northeast to southwest orientation lying between the Inyo and White Mountains about 25 miles northeast of Big Pine.

## Current

Within Deep Springs Valley, the BT occurs in and around Corral Spring, Buckhorn Spring, and several smaller springs, ponds, and irrigation ditches along the southeast edge of the valley. A disjunct population occurs at Antelope Springs on the west side of the valley approximately 5 mi (airline distance) from Buckhorn Spring (Sherman 1980) (Figure 1).

One source of BT mortality has been the loss of tadpoles due to irrigation water diversion. Many BT oviposit in irrigation canals and if the water is diverted to surrounding pasture land in May or early June the tadpoles are stranded and die. Also, if BT oviposit in irrigation ditches, all of the rain water may evaporate before diversions provide another water source.

Extensive trampling of the stream course and thus eggs and tadpoles, occurs at Antelope Springs. This is due to high cattle density which is caused by the facts that Antelope Spring is the only water source in the area, and is smaller than the springs on the other side of the valley. An infrequent source of mortality occurs from adult toads being trampled by cattle (Sherman 1980).

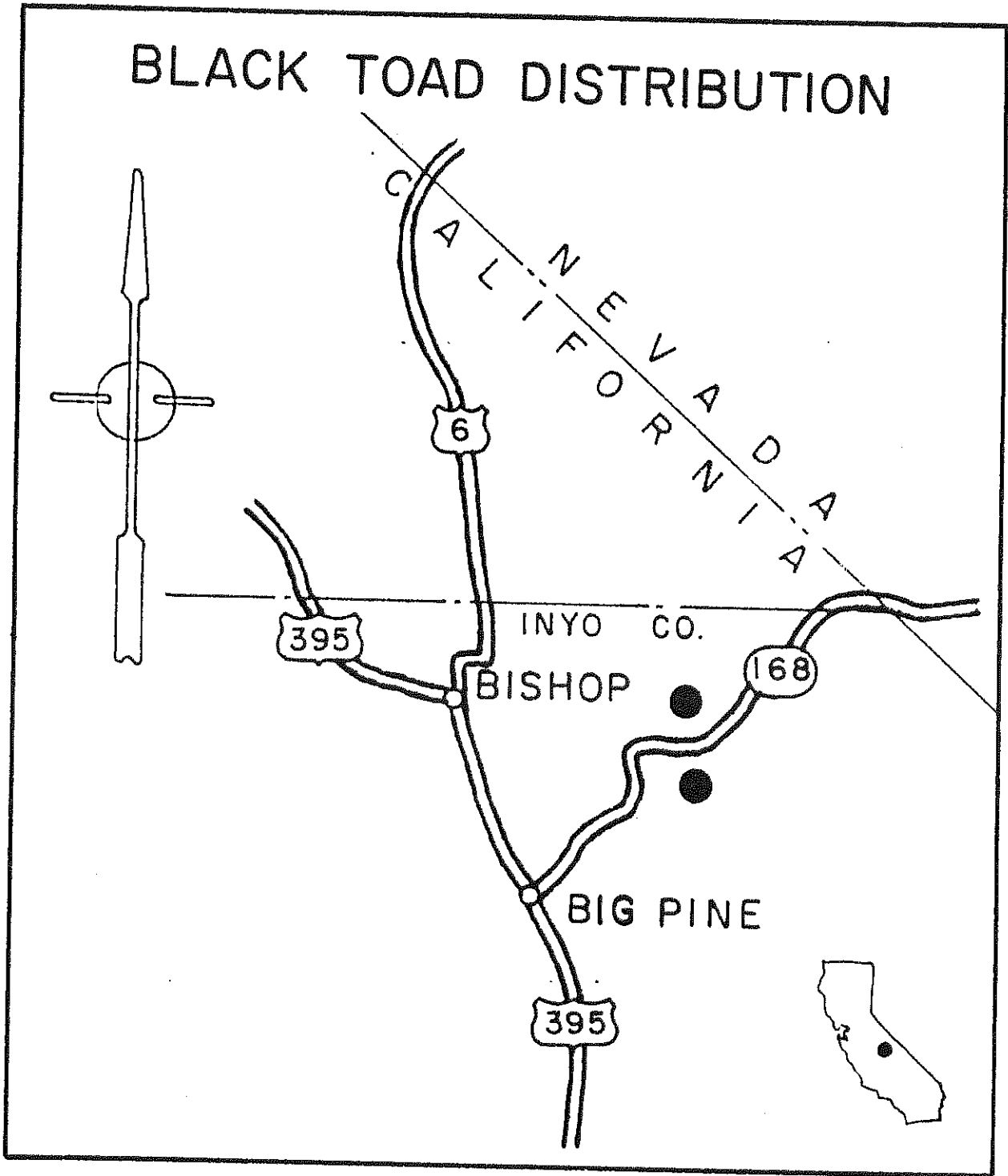
### VI. HISTORIC AND CURRENT ABUNDANCE:

The population of BT in Deep Springs Valley was estimated at about 10,000 in 1978 (Sherman 1980). Historic estimates have been as low as 700 (Myers 1942), but were based on visual counts and therefore were probably inaccurate.

### VII. SPECIES DESCRIPTION AND BIOLOGY:

The BT is a small (2 1/2 in) toad of the family Bufonidae or "true toads". Myers (1942) described it as being shining lacquer black. Dorsal color is black with whitish or brownish vermiform markings, and a white line down the middle of the back. The throat and belly are white with black spotting, and the underside of the femur and rump are completely black except for the tubercles which are white. There is no difference in coloration between males and females. Females are usually larger than males (Sherman 1980).

Schuieler (1961) and Sherman (1980) suggest that the black color may have evolved to blend in with the dark substrate. Although nocturnal during the hotter summer months, BT are diurnal in early spring. The BT of the Antelope Springs population are significantly larger than the Buckhorn Springs and Corral Springs populations (Schuieler 1962, Sherman 1980). This may be due to the fact that the dense willow stands which shade Antelope Springs may also protect the BT from avian predators, allowing the population to contain older, larger toads.



At The Crossroads, 1980. Calif. Dep. of Fish and Game.

The BT is highly aquatic and seldom found far from water (Myers 1942).

The larvae of BT are uniformly black and usually do not reach sizes larger than .1 in. The eggs are deposited in bead like strings among emergent vegetation. The eggs are often in a zig-zag pattern within strands extending 12 to 18 in from the main mass of eggs (Livezey 1960).

The BT is active during the spring and summer, although it is active only at night during hot weather. BT hibernate 4-5 months of the year, from mid-November to mid-March, seeking refuge in rodent burrows or deep within the substrate under the banks along the water courses (Schuierer 1961). Males and females hibernate in groups of 20-30 or singly. The males hibernate near the breeding sites (marshes), the females near the springs. Juveniles hibernate in the shallow marsh areas near where they metamorphosed (Sherman 1980).

The BT breeds in shallow marshes and irrigation ditches from mid-March until the end of April. There is more breeding activity on warm sunny days than on cold overcast days. Males arrive at the breeding grounds in mid-March, about four days earlier than females. No territories are established (Sherman 1980) and males do not chorus (Schuierer 1961). The only vocalizations are clucking noises. The males will cluck when mounted by another male, during multiple amplexus and when moving around the breeding grounds during amplexus (Sherman 1980).

The eggs are laid in the open water of shallow pools (1-3 in deep) along the edge of marshes, irrigation ditches, and natural streams. The eggs hatch in 7-9 days and metamorphose in 65-100 days. The metamorphosed juveniles remain in the spawning area during the remainder of the year. Sexual maturity is reached in 2-3 years for males and 3 years for females (Sherman 1980). The main food items for the BT are insects of the orders Diptera, Coleoptera, and Hymenoptera. Mollusks and fairy shrimp are frequently present in juvenile diets (Livezey 1961, Schuierer 1961).

Predation upon BT adults by black-billed magpies (Pica pica) and ravens (Corvus corvus) has been observed (Sherman 1980). Other possible predators include long-tailed weasels (Mustela frenata), marsh hawks (Circus cyaneus), gopher snakes (Pituophis melanoleucus), rattlesnakes (Crotalus viridis), night snakes (Hypsiglena torquata) and king snakes (Lampropeltis getulus) (Sherman 1980). Females are more vulnerable to predation during the breeding season because they are not as agile when gravid and are less able to escape. The BTs main defense against predators is diving into the water. Another form of defense against predation is the secretion of noxious fluids (Sherman 1980).

Predation upon tadpoles has not been observed, but potential predators are the common snipe (Capella gallinago), red-winged blackbirds (Agelaius phoeniceus) and aquatic insects (Sherman 1980).

#### VIII. HABITAT REQUIREMENTS:

BT habitat extends over approximately 120 acres at Corral Springs and 150 acres at Buckhorn Springs, but the actual aquatic areas used by the toads are undoubtedly less extensive (Sherman 1980).

The vegetation surrounding BT habitat is typically sagebrush scrub, including sagebrush (Artemisia sp.), saltbush (Atriplex sp.), and rabbit brush (Chrysothamnus nauseosus). Various rushes (Juncus sp.), bulrushes (Scirpus sp.), sedges (Carex sp.), and aquatic plants grow in the marshes and streams (Schuierer 1961).

The water temperature of the springs is relatively constant throughout the summer and ranges from 64-68<sup>o</sup>F (Schuierer 1961, Sherman 1980). The water temperature in the marshes and streams undergoes a daily and a seasonal cycle. On a daily basis the water is cold, sometimes frozen in the morning, becomes warmer during the day, reaching its warmest between 1300-1600 hr (Sherman 1980) and then cools down at night. During the year the water temperature increases so that the water temperature after dark in April is warmer than before sunset in March. The valley receives snow in the winter and is dry during the summer.

#### IX. CURRENT AND RECOMMENDED MANAGEMENT:

Deep Springs Valley has been used to graze cattle for the past 100 years. When cattle grazing began, irrigation ditches were dug to divert water from the natural streams and marshes onto the dry pastures for summer grazing. The springs in Deep Springs Valley are also used as a water source for Bighorn sheep (Ovis canadensis) which inhabit the mountain ranges south of the valley (Pister 1971). DSC, which is affiliated with Cornell University (Busack and Bury 1975), is the largest private landowner in Deep Springs Valley, and their property includes Corral, Buckhorn, and Antelope Springs. The DFG owns 720 acres of land in Deep Springs Valley. Much of this land includes Deep Springs Lake and therefore contains little actual habitat for the BT. DFG ownership does, however, prevent private development which could affect the springs. Most of the remaining land is administered by the Bureau of Land Management (BLM) and the U. S. Forest Service (USFS).

Current management of the BT involves working cooperatively with DSC. At present, DSC is voluntarily manipulating the water in the irrigation ditches to reduce adverse effects on

the BT. This includes delaying water diversions until after tadpoles have metamorphosed. DSC has also fenced off areas to exclude livestock from certain parts of BT habitat. DFG has posted signs advising would-be collectors that the BT is protected by law (Nicol 1984).

No regular monitoring effort is currently undertaken by the DFG, other than an occasional site visit. Changes in population numbers or habitat would not necessarily be detected by this level of effort. Surveys should be conducted to monitor the status of the habitat and toad population, preferably during the breeding season when the actual population size and reproduction status is most evident.

Since it is unlikely that more populations of BT will be discovered, it seems prudent to maximize the chances for the existing ones to survive, and to maintain the habitat at least in its present condition. To do so, cooperation between DSC and DFG must continue. A written Memorandum of Understanding should be developed for cooperative management of BT habitat. It should include: 1) appropriate practices of water management and; 2) measures to assure protection of natural water sources, including protective fencing, as needed, of such areas as Antelope Spring and other specified toad habitats; 3) assessment of feasibility of carp removal from waterways to maintain aquatic vegetation, if such removal can be done without injury to indigenous life forms; 4) implementation of a vegetative maintenance program, if necessary, as BT do not breed in waters overgrown with sedges. Submerged algae seems to be appropriate; and 5) an annual survey of toad population numbers, size, structure, and habitat suitability (Nicol 1984).

Small populations on the west side of the valley are within or near BLM and USFS lands. Cooperation with these two agencies on management of the BT is recommended. Lands within their jurisdiction may be manipulated to provide more suitable habitat for BT populations (Nicol 1984).

#### X. INFORMATION SOURCES:

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