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FIVE YEAR STATUS REPORT

I. COMMON NAME: Limestone Salamander
SCIENTIFIC NAME: Hydromantes brunus
CURRENT CLASSIFICATION: Threatened

II. RECOMMENDED ACTION:

Retain Threatened classification.

III. SUMMARY OF REASONS FOR RECOMMENDED ACTION:

Due to its limited distribution, and the lack of information regarding its population size, ecological requirements, life history, and mobility, Threatened classification is warranted for the Limestone Salamander (LS).

SUPPORTING INFORMATION

IV. NATURE AND DEGREE OF THREAT:

The major threats to the LS are the lack of habitat meeting the criteria considered necessary, and the fragile nature of this habitat. A major threat to LS habitat is the increase in gold mining activity in the area, including a planned 720 acre open-pit and tunnel gold mining project which proposes realignment of Highway 49. Water development downstream from habitat sites is another known threat. Additional threats may exist. Our knowledge of this species is cursory, and is in part extrapolated from information about other Hydromantes.

V. HISTORIC AND CURRENT DISTRIBUTION:

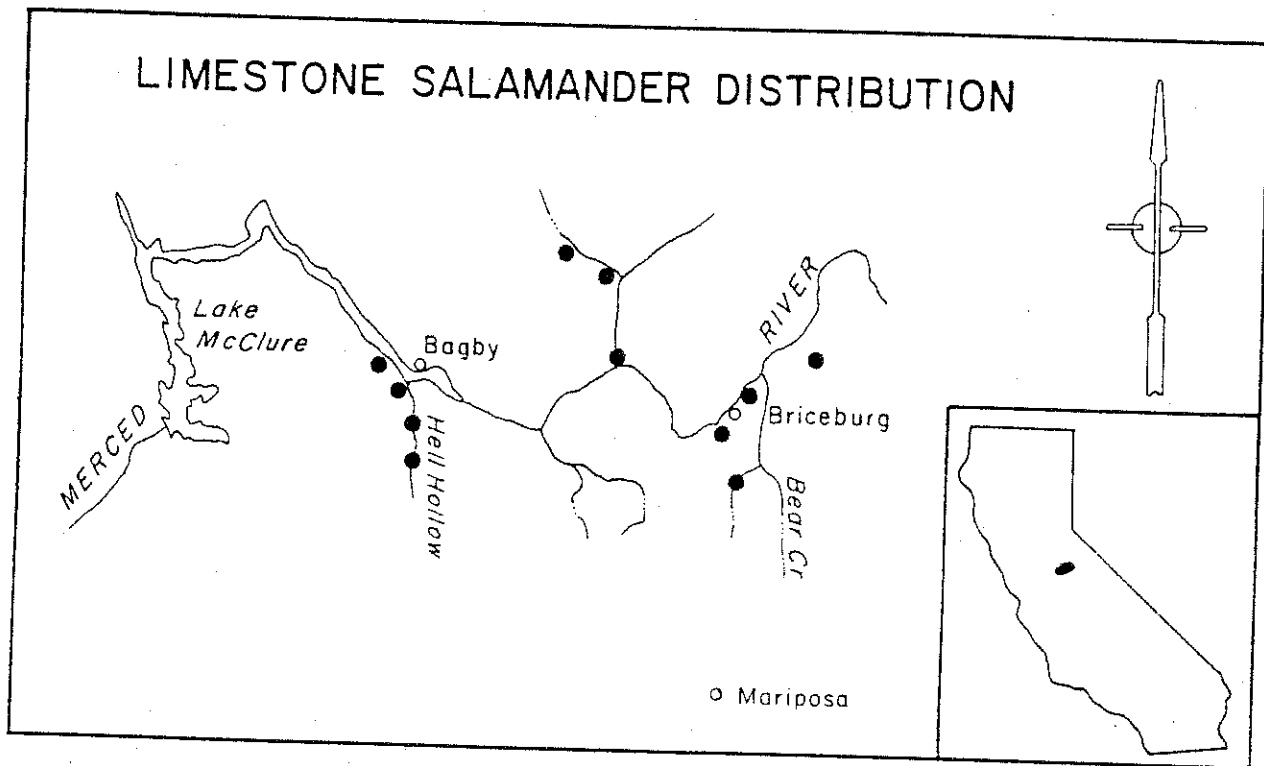
Historic

This is a relict species whose ancestry may go back 40 or 50 million years, to the early Tertiary. It was first described in February, 1952 by Gorman (1954) from specimens collected near Briceburg, California, along Highway 140.

Current

This species is only known to occur in a few scattered locations in Mariposa County (Figure 1); in the vicinity of Briceburg, at the confluence of Bear Creek and Merced River, along the tributaries of Bear Creek, on the North Fork of the Merced River, at Hell Hollow about 4 mi above Lake McClure, and at the confluence of Hell Hollow Creek with Lake McClure (Department of Fish and Game 1980). They are found between 1000 and 2150 ft in elevation (Stebbins 1985). It seems likely that other population sites have yet to be located (Tordoff 1980).

FIGURE 1



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

VI. HISTORIC AND CURRENT ABUNDANCE:

Neither historic nor current abundance information is available. However, in 1983 Tordoff estimated a population of between 330 and 904 LS at one major population site at Hell Hollow (Tordoff, W. III 1983. Unpublished report).

VII. SPECIES DESCRIPTION AND BIOLOGY:

The LS is one of the three California species of web-toed salamanders. LS is relatively uniform genetically, and is the most distinct species of the genus Hydromantes in California (letter dated 27 February, 1987 from David B. Wake, Director, Museum of Vertebrate Zoology, Berkeley, CA). It has webbed toes, a mushroomlike tongue with free edges, and a flattened body. The 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 and beige to brown. The tongue is very long and can be extended 1/3 the length of the body (excluding tail) to capture prey. Males have projecting upper-jaw teeth and an oval mental gland. The snout to vent length of this species is 2-3 in. Adults grow to an overall length of 3-4 in. The tips of the toes overlap by 1 1/2 costal folds when the limbs are pressed to the sides of the body. There are 13 costal grooves, including one each in the axilla and groin. (Stebbins 1985, Gorman 1956).

LS are active during fall, winter, and early spring rains, except during cold spells. During this period, LS can be found on the surface at night during and after warm rains. They are excellent climbers, moving with ease over smooth rock surfaces. On a steep slope, they use their tails as an aid in locomotion, curling the tip forward and placing it against the ground as the hind foot is lifted (Stebbins 1947). They often coil their bodies when molested (Tordoff 1980, Stebbins 1985).

Little is known about the breeding habits of the LS. Eggs are probably laid in the spring and hatch in late fall (Stebbins 1954; Gorman 1956).

VIII. HABITAT REQUIREMENTS:

The most important habitat requirement appears to be the need for moss covered talus piles and cliff crevices which serve as refuge for this species during the summer drought and heat. The second ecological requirement is steep north- to east-facing slopes which provide two necessary habitat elements. The first is shade from the sun which keeps down the temperature and maintains moisture. Secondly, the steep slopes with exposed rock outcrops provide for the buildup of talus piles which are so necessary for the LS (Tordoff 1980).

This species frequents limestone in the Digger pine (Pinus sabiniana), live oak (Quercus wislizenii), canyon oak (Q. chrysolepis), buckeye (Aeschulus californica), and chaparral belt of the lower Merced Canyon, California. Shrubs at confirmed sites include buckbrush (Ceanothus cuneatus) and toyon (Heteromeles arbutifolia) with chaparral elements, chamise (Adenstoma fasciculatum), manzanita (Arctostaphylus sp.), and yerba santa (Eriodictyon californicum). Shrub cover is non-homogeneous, being thick in places with patchy openings where the sun reaches the ground. Poison oak (Rhus diversiloba) is abundant in LS habitat (Tordoff 1980).

The LS lives in crevices of cliffs and ledges and in talus, especially where the rocks are overgrown with moss. Habitat is characterized by having upwards of one-third of the ground covered by either rock outcrops or loose rock. Also, at least half of the rocks are covered by moss. LS appear to favor moist but not wet conditions, and therefore are found more often on the slopes of ravines and canyons, than on the floors (Stebbins 1985; Tordoff 1980).

Most population sites have north to east facing slopes which are relatively steep (34 to 51 degrees). Suitable slopes which face slightly west of north exist in steep and narrow canyons. In these areas the opposite slope probably provides sufficient afternoon shade so that the hillside is not as warm or dry as exposed northwest facing slopes (Tordoff 1980).

IX. CURRENT AND RECOMMENDED MANAGEMENT:

A DFG Ecological Reserve for the LS was established near Briceburg in 1975. The reserve is located along the south side of State Highway 140, 0.2-0.7 mi east of Briceburg in Mariposa County. It contains 120 acres and includes the northwest portion of a steep ridge oriented in an east-west direction.

The prime purpose of this reserve is to maintain the habitat in its natural condition. Because of the fragile nature of this habitat, general public use is not allowed and the exact location of the reserve has not been advertised. Special regulations adopted by the Fish and Game Commission in January 1975 (Section 644, Title 14, CAC) state that no person shall enter the reserve for any purpose with the exception of employees of DFG in the performance of their official duties, and persons engaged in the scientific research or management of the salamander possessing written permission from an authorized official of the DFG (Brode 1976).

The area between the reserve and Highway 140 to the north is administered by the Bureau of Land Management (BLM). At present these lands are classified for multiple use and retention. BLM has been contacted regarding the management of their land in keeping with the purpose of the ecological reserve and

approximately 1,600 acres has been designated as a BLM Area of Critical Environmental Concern (ACEC), and as such is protected from development preserves. Additional land should be added to the ACEC.

Because existing studies have been inconclusive as far as determining the population status of the LS, it is recommended that any significant human activity or alteration of habitat in known population sites be prevented. The habitat is fragile in that major disturbances of vegetation move the rocks of the talus slopes and could destroy LS habitat. Also, construction of roads or trails would have the same effect (Tordoff 1980).

The Hell Hollow area contains the largest known population of LS, and is the only major population area which is privately owned. The population site adjacent to Lake McClure should be placed in public ownership (Tordoff 1980).

Further studies are necessary to confirm additional populations and to estimate population levels. In addition, studies and the development of experimental talus slopes should be initiated to investigate LS life history (Tordoff 1980; telephone conversation of 30 March 1987 with W. Tordoff III California State College Stanislaus, Turlock, CA).

X. INFORMATION SOURCES:

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