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State of California
THE RESOURCES AGENCY
Department of Fish and Game

AMARGOSA VOLE STUDY

by

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Progress Report

SUMMARY:

A study of the Amargosa vole (Microtus californicus scirpensis) was undertaken from April 17 to 23, 1977, in the Shoshone-Tecopa area, Inyo County. In 382 trap nights, five voles were caught, all in the Tecopa-Tecopa Hot Springs area. These animals were mainly live-trapped in tule (Scirpus olneyi) marshes formed by water from springs. Due to the character of the habitat, the voles did not form runway systems which could be used to determine population density. Further field work will be carried out in October 1977.

BACKGROUND:

The Amargosa vole, thought to be extinct since about 1917 (Kellogg 1918) recently has been found to be extant (Sayre 1973). This species was collected along the Amargosa River in 1937 (Allen 1942) near Tecopa but apparently many authorities have chosen to ignore this reference or were ignorant of it. Nevertheless, this vole appears to be rare and its habitat limited to a few tule marshes in a desert environment. These marshes are subject to possible natural destruction and human encroachment in the Tecopa-Tecopa Hot Springs area. No previous studies of its distribution or abundance have been made.

OBJECTIVES:

Objectives of the Amargosa Vole Study are: (1) to determine the current distribution and abundance of this vole; (2) to determine its habitat requirements; and (3) to recommend measures for its protection and management.

PROCEDURES:

Reconnaissance of possible vole habitat as described (Bailey 1900) was made of the Amargosa River from the California-Nevada border downstream to the Amargosa Canyon south of Tecopa and in the Fort Baker-Soda Lake area. Traps were set in marsh habitat where tules were present at one site in the Fort Baker-Soda Lake area, one site near Shoshone, and at 12 sites in the Tecopa-Tecopa Hot Springs area (Figure 1).

Traps were placed in a linear fashion and were used to establish whether voles were present or not. Due to the density of tules in some areas, traps were set at the periphery of the tule habitat.

Trapping was conducted on the nights of April 17 through April 22. In the six nights of trapping, 382 trap-nights were realized, of which 202 were with live traps and 180 with snap traps (museum specials). The use of a runway index to gauge vole density (Lidicker and Anderson 1962) was investigated. Habitats trapped were photographed and described.

FINDINGS:

Five Amargosa voles were trapped, all in the Tecopa-Tecopa Hot Springs area. Two were adult males, and one each was an immature male, immature female and an adult female. No two of the trapped voles were taken at the same trap site though a minimum of 10 and usually 20 traps were set at each site.

The three males and immature female were caught in live traps and the adult female was snap trapped. Both females are being prepared as museum specimens since the immature female apparently died of exposure in the trap. It was the only one of 25 rodents caught in live traps which was lost. In addition, 23 western harvest mice (Reithrodontomys megalotis), 10 cactus mice (Peromyscus eremicus), seven house mice (Mus musculus) and one desert wood rat (Neotoma lepida) were caught.

In comparing some parameters of the habitat (Table 1), no particular feature appears to control vole distribution in the marsh habitat. At sites where voles were trapped, Scirpus density varied from dense to moderate to open but usually provided a good canopy effect for rodent populations. There usually was a water course flowing down a noticeable incline. The slope could be quite gradual and generally voles were not found in marsh habitat on the flat of the Amargosa River flood plain. Water was present under the tules, usually spread out and flowing as a shallow, less than 1 cm deep stream, up to 25 m wide. Occasionally the water course was no more than 30 cm wide and incised 10 to 20 cm in a small channel. The habitat surrounding the tules appeared to be of little consequence to the presence of voles. Salt grass and a rush were noted commonly but vole runways were not present in this drier vegetation type.

Runways were usually indistinguishable in the Scirpus except where droppings could be found. Commonly the microhabitat under the canopy of tule stems consists of an open area 5-10 cm high which is only interrupted by the clumped, narrowed lower ends of the Scirpus stems where they emerge from the ground. The spaces between adjacent emergent stems may be 3-15 cm. Since this area is quite open, rodents utilizing this space have a virtually unlimited choice of paths to travel and there is no need to push vegetation aside and create runways. Mud islands of all sizes up to 20 by 50 cm are common. Where found, Microtus feces were placed on these small islands.

ANALYSIS:

It appears that the Amargosa vole can be caught in live traps. Because of the rare nature of the vole, future work should be done with live traps.

TABLE 1

HABITAT CHARACTERISTICS OF TRAP SITES, AMARGOSA VOLE STUDY, INYO COUNTY, 1977

SITE	MICROTUS TRAPPED	SCIRPUS DENSITY			TOPOGRAPHIC SITUATION			WATER			
		High	Moderate	Open	River Flat	Shallow Gradient	Steep Gradient	Not Present	Standing Pool	Spread Out	In Incised Water Course
1	Yes	X					X				X
2	No Traps Set			X			X				X
3	No	X			X					X	
4	Yes		X	X			X			X	
5	No		X		X	X					X
6	No	X			X				X		
7	No	X				X				X	
8	Yes		X				X			X	X
9	No		X				X	X		X	
10	Yes	X	X		X				X		
11	No		X				X			X	
12	Yes	X				X				X	X
13	No			X		X				X	

The October trapping session should employ a minimum of 125 to 150 live traps. Additional sites near Shoshone and in Amargosa Canyon should be trapped as well as habitat in the Tecopa-Tecopa Hot Springs area since not all habitat was checked. This would further define the distribution of the vole.

It does not appear that a determination of population density or abundance will be feasible. There is no developed runway system obvious enough to be counted for analysis. The presently low number of individuals and the animal's rare nature may make a capture-mark-recapture population estimate inaccurate, uneconomical and imprudent.

Because there are areas where the September 1976 tropical storm destroyed the tule habitat, some effort should be made to make a more thorough determination of distribution and habitat preference after the habitat has regenerated. This should be possible in October 1977 and would be particularly important for the Amargosa Canyon area.

RECOMMENDATIONS:

1. Proceed with the October 1977 field work.

2. Determine land ownership in the Tecopa-Tecopa Hot Springs area: Sections 3, 4, 5, 6, 8 and 9 of T. 20 N., R. 7 E. and Sections 28, 29, 31, 32 and 33 of T. 21 N., R. 7 E.

3. Familiarize Unit Manager with Amargosa vole and its habitat.

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