

E. Wayne Hammer

Route 1, Box 2
Bonanza, Oregon

and

Chris Maser

Puget Sound Museum of Natural History
University of Puget Sound
Tacoma, Washington

Distribution of the Dusky-Footed Woodrat, *Neotoma fuscipes* Baird, in Klamath and Lake Counties, Oregon

The dusky-footed woodrat, *Neotoma fuscipes* Baird, was first reported in Oregon east of the Cascade Mountain Range (Klamath County) by Murray and Barnes (1969). From March 1970 to September 1971, we searched for the lodges of *N. fuscipes* in Klamath and Lake counties. The purpose of this paper is to record the presently known habitat preference and distribution of *N. fuscipes* in Oregon east of the Cascade Mountains.

Methods

The easily discernible lodges of the woodrats were located while traveling along roads and cross-country. Their locations were plotted on a map by township, range, and section (Fig. 1, Table 1). Lodges were examined with respect to habitat, building site, construction, storage of food, and activity around the dwelling, including many that were found to have been abandoned. Twenty-eight woodrats were collected to verify important locality records and at least 50 were seen, but not collected. The specimens that were collected are in the Puget Sound Museum of Natural History, Tacoma, Washington.

Distribution and Habitat

Murray and Barnes (*op. cit.*) reported *N. fuscipes* nests from ". . . upper Coyote Valley, 7.3 mi. S, 16.2 mi. E. Lorella . . ." (T41S,R15E,Sec.5) and at ". . . Miller Creek, 4.3 mi. SE Lorella . . ." (T40S,R14E,Sec.7), Klamath County, Oregon. They stated that their ". . . intensive search . . . from near Lakeview, Lake County, west to the vicinity of Dairy, Klamath County, Oregon, failed to produce evidence of woodrat lodges." Murray (1972) said that Barnes collected the specimens in Oregon in 1964. Barnes searched along Highway 140 from Lakeview, Lake County, over Quartz Mountain Pass to Dairy, Klamath County. A search was made near the Lake-Klamath County line, along the Sprague River (Highway 140), and from Bly, west of Horsefly Mountain and Gerber Reservoir, to Lorella. An additional search was made from Dairy to Lorella (Oregon State Highway 70) and along Drews Creek (Highway 66), as well as forays to Brushy Mountain and Dog Lake, in the SW corner of Lake County (Murray, 1972). It appears that by staying on the main roads the distribution of

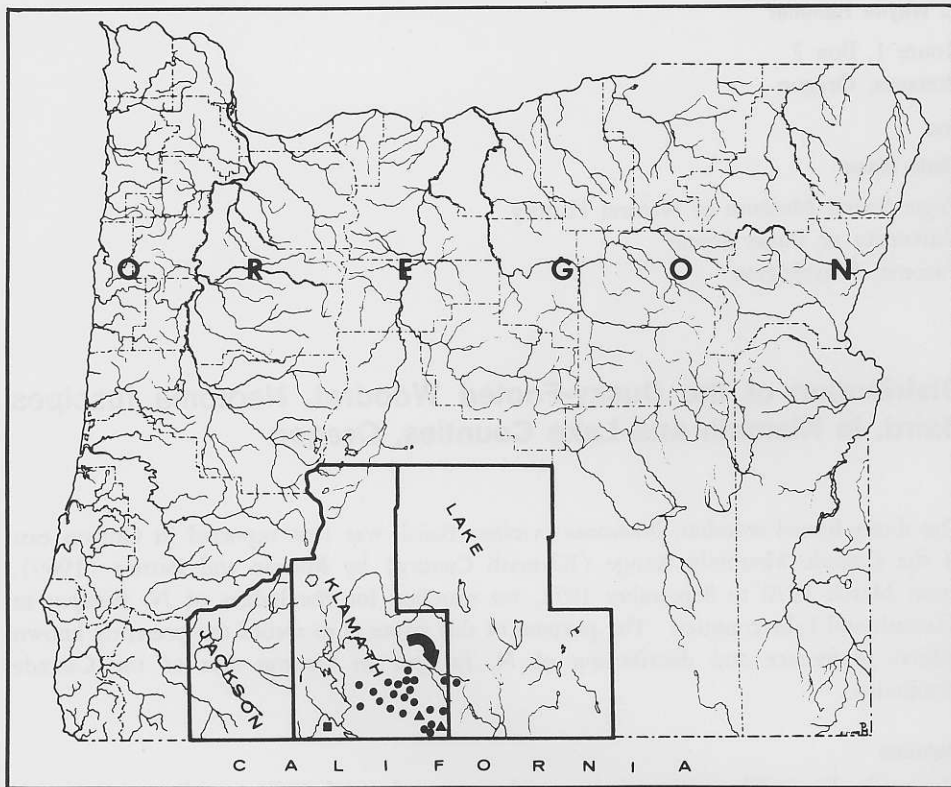


Figure 1. Distribution of *Neotoma fuscipes* in Klamath and Lake counties, Oregon. Circles—woodrat lodges found during the study. Triangles—woodrat lodges reported by Murray and Barnes (1969). Square—woodrat population found by Murray and Gresbrink in June 1972.

N. fuscipes in Klamath County was probably not realized by Barnes. The dusky-footed woodrat is common in the southeastern portion of Klamath County.

Upper Coyote Valley is 4 mi. N of the California border; Miller Creek is 8 mi. N

TABLE 1. Distribution of dusky-footed woodrat lodges and sites of specimen collections in Klamath and Lake counties, Oregon.

KLAMATH COUNTY:

T41S: R14E,Sec.12*; R14-1/2E,Sec.24*, Sec.12*; R15E,Sec.5**.

T40S: R11E,Sec.4*; R12E,Sec.2; R13E,Sec.8*; R14E,Sec.7***, Sec.21, Sec.13, Sec.12; R15E, Sec.7, Sec.9*.

T39S: R11E,Sec.22*, Sec.14*, Sec.9*; R12E,Sec.17*, Sec.8*, Sec.10*, Sec.12, Sec.1; R13E, Sec.7*, Sec.8*, Sec.17, Sec.16, Sec.22; R14E,Sec.29, Sec.33, Sec.28; R15E,Sec.26.

T38S: R11-1/2E,Sec.4; R11E,Sec.28, Sec.12; R12E, Sec.29, Sec.28, Sec.13.

T37S: R12E,Sec.9*; R15E,Sec.23, Sec.11, Sec.12.

LAKE COUNTY:

T37S: R16E,Sec.18.

* Specimen collected during the present study.

** Coyote Valley.

*** Miller Creek.

of the California border (12 mi. W, 5 mi. N of Coyote Valley). One of the northernmost records that we obtained of *N. fuscipes* was 26 mi. N of the California border (T37S,R12E,Sec.9), 4 mi. W, 21 mi. N of Miller Creek. One of our two westernmost records of *N. fuscipes* was 1 mi. W, 8 mi. S (T40S,R11E,Sec.4) of Dairy, 16 mi. due W of Miller Creek; the other was 1 mi. W, 5 mi. N (T38S,R11-1/2E,Sec.4) of Dairy, 16 mi. W, 16 mi. N of Miller Creek. The easternmost locality record of *N. fuscipes* was in Lake County, 22 mi. N, 5 mi. E (T37S,R16E,Sec.18) of the upper Coyote Valley, 25 mi. N of the California border. It appears that the Sprague River (the major river depicted by the arrow in Figure 1) has formed at least a temporary barrier to northward movement. The woodrats might be able to move eastward and then northward around the Sprague River in Lake County; if the Sprague River freezes solidly enough during the winter, the woodrats could cross due northward over it. Once across, the woodrats should not encounter any major barriers to northward range expansion until they reach the Columbia River.

The successful northward movement of *N. fuscipes* east of the Cascade Mountain Range depends upon the habitat requirement: juniper, *Juniperus* sp., Woodland. Juniper was the woodrats' major source of food, lodge and nest material, and building sites. While the woodrats depended upon the green portions of juniper as their principal diet, when available they fed heavily upon the green leaves and twigs of curlleaf mountain-mahogany, *Cercocarpus ledifolius* Nutt., and bitterbrush, *Purshia tridentata* (Pursh) D.C. Near the northern limit of the woodrats' distribution, the juniper woodland became intergraded with yellow pine, *Pinus ponderosa* Laws. There we found the woodrats to have fed occasionally upon the needles of yellow pine. Other foods included service berry, *Amelanchier alnifolia* Nutt., willow, *Salix* sp., buttercups, *Ranunculus* sp., and False Solomon's Seal, *Smilacina* sp.

Juniper trees were preferred for lodge sites and materials. Most lodges were constructed within the crowns, at the bases of, or in hollow portions of living junipers. Ground lodges built around logs, stumps, in brush piles, and occasionally brush thickets were more frequently encountered in the yellow pine/juniper habitat.

The materials used to construct the lodges were primarily the twigs of juniper. Where junipers were very limited, they were occasionally denuded of living material by the woodrats during lodge construction and food gathering. In such situations, a variety of substitute materials were used in the construction of the lodges, e.g., any transportable dead wood, old bones, and dried dung. The material used to build the inner-nest chambers was almost solely the outer bark of juniper which the woodrats stripped off of the living trees.

Discussion and Conclusions

Murray and Barnes (*op. cit.*) stated that the dusky-footed woodrats that they collected fitted the description of *Neotoma f. fuscipes* Baird; our specimens conform.

We think it impossible for *N. fuscipes* to have been formerly in Oregon east of the Cascade Mountains without detection; Murray and Barnes (*op. cit.*) had the same thought with respect to their study in northeastern California. We have trapped in numerous areas along the eastern flank of the Cascade Range from Klamath County northward into Jefferson County over a period of eleven years (1960-1971). At no time did we encounter dusky-footed woodrats. Had the dusky-footed woodrat ever been as far north as Jefferson County, it is unlikely that the entire population would

have been totally eliminated. Assuming that *N. fuscipes* is extending its range northward into country previously uninhabited by the species, a possibly unique opportunity exists to monitor the rate of northward movement at 5- to 10-year intervals. The rate of movement could be computed in air-miles per year giving an idea of how fast a successful species can invade new territory.

It would also be interesting to study the competition that has arisen between *N. fuscipes* and the bushy-tailed woodrat, *Neotoma cinerea* (Ord). We have found *N. cinerea* commonly to utilize hollow, living juniper trees as well as logs as nesting sites, particularly when rimrock is absent. On 22 June 1970 we collected a *N. cinerea* in one of 11 *N. fuscipes* lodges examined (T40S,R15E,Sec.9). One lodge contained a dead *N. cinerea*; the remaining nine had not been used for several months.

Three dead *N. fuscipes* were found during the study: (1) 3 April 1970 (T39S, R14E,Sec.7), (2) 10 April 1970 (T39S,R13E,Sec.1), and (3) 15 June 1970 (T40S, R15E,Sec.9). The first two rats were found dead and decomposed in lodges; the third, relatively fresh, was found dead on a road. Finding no sign of predation, the third dead rat was submitted to the Oregon State Board of Health. According to Robert A. Gresbrink, Program Supervisor Vector Control, all tests for disease were negative (personal communication, 1970). Murray and Barnes (*op. cit.*) stated that "Both *N. fuscipes* and *N. cinerea* are susceptible [to plague organisms, *Yersinia (Pasteurella) pestis* (Lehmann and Neumann)] and have been known to suffer epizootic mortality on several occasions." Therefore, *Neotoma fuscipes* east of the Cascade Range is a potential source of plague within the state. Despite no evidence of disease having been found in the one animal submitted for tests, the many abandoned lodges observed during this study are strong circumstantial evidence of epizootic (Murray, 1972).

In June 1972, Murray and Gresbrink made a joint plague survey along Topsy Road, Klamath County, Oregon, bordering the Klamath River Canyon on the east, south of Oregon State Highway 66. They found a continuous population of *N. fuscipes* from California to Topsy Road. The woodrats were located in "heavier than typical coniferous forest." There was considerable one-plus-year-old abandonment of lodges which could be associated with the plague epizootic occurring west of Dorris, Siskiyou County, California (Murray, 1972).

Summary

1. *Neotoma fuscipes* is common in the southeastern portion of Klamath County, Oregon, and is reported from Lake County as well. The distribution of the species is given.

2. Where juniper trees were absent, *N. fuscipes* were not found. Therefore, the northward range expansion of *N. fuscipes* seems to depend upon the availability of junipers.

3. *Neotoma fuscipes* is a potential source of sylvatic plague, *Yersinia (Pasteurella) pestis*, in Oregon east of the Cascade Mountain Range.

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