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Double Captures of Four Rodent Species in Oregon

Abstract

Possible factors involved in the capture of two animals simultaneously are discussed relative to four species of rodents.

Occurrence of two animals simultaneously in a Sherman live-trap (double capture) has been described by relatively few investigators (Sheppe, 1967; Dunaway, 1968; Petersen, 1975). Getz (1961, 1972), using traps specifically designed for multiple captures, related multiple captures to levels of antagonistic behavior, associated with density, in a population of meadow voles (*Microtus pennsylvanicus*). This paper suggests possible factors responsible for 51 double captures, involving 80 animals, which occurred during 28,743 trap-nights over a 3-year period on Malheur National Wildlife Refuge, Harney County, Oregon.

Double captures occurred on nine 1.13 ha sites located in desert shrub, marsh and grassland areas, where Sherman live-traps were arranged in square grids ($7 \times 7 = 49$ traps) with 15.0 m intervals between stations. Traps were baited with rolled oats, checked once daily, and were removed following a 10-day trapping period. Rodents comprising double captures included the deer mouse (*Peromyscus maniculatus*); the pocket mouse (*Perognathus parvus*); the western harvest mouse (*Reithrodontomys megalotis*); and the montane vole (*Microtus montanus*).

Only three instances of interspecific double captures were noted. All involved a *Peromyscus* and a *Perognathus* and in each instance the pocket mouse was killed with no apparent adverse effect to the deer mouse. Evans and Holdenreid (1943) reported similar findings for 27 double captures between species of these genera in California.

Considering conspecific double captures (Table 1), heterosexual pairs occurred more often than homosexual pairs for all species except the montane vole, although only for the harvest mouse was this difference statistically significant (all significance levels were considered to be $P \leq .05$). Petersen (1975) reported finding only heterosexual pairs in 12 double captures of Western harvest mice and Dunaway (1968) trapped only heterosexual pairs of Eastern harvest mice (*R. humulis*). In the 16 double captures involving voles, only two pairs were heterosexual (Table 1), and of the 14 remaining pairs, all were males.

A double capture suggests that either the pair entered the trap together or that the animals entered separately, but the weight of the initial animal was insufficient to activate the trap. In this study, the average weight of the lightest member of each pair of harvest mice comprising a double capture ($\bar{X} = 9.6$ g.) was not significantly different from the average weight of harvest mice captured alone ($\bar{X} = 10.9$ g., $t = 1.19$, 25 degrees of freedom (df)). However, the average weight of the lightest member of each pair of deer mice comprising a double capture ($\bar{X} = 17.3$ g.) was significantly

TABLE 1. Conspecific pairs of rodents comprising double captures during a 3-year period on Malheur National Wildlife Refuge. Chi-square values determine the significance of the number of homo-vs. heterosexual pairs of each species comprising double captures.^a

Species	Number of Double Captures			Total	X ² value
	♂ ♂	♂ ♀	♀ ♀		
<i>Microtus montanus</i>	14	2	0	16	6.19 ^b
<i>Peromyscus maniculatus</i>	6	10	0	16	1.64
<i>Reithrodontomys megalotis</i>	0	6	0	6	6.00 ^b
<i>Perognathus parvus</i>	0	3	1	4	1.29
Total	20	21	1	42 ^c	

^a Trap revealed sex ratios for all species except *R. megalotis* were significantly biased towards males. Thus, the expected values involved in these calculations were appropriately adjusted. Males per 100 females: *M. montanus* = 215; *P. maniculatus* = 173; *P. parvus* = 170.

^b Significant at $p \leq .05$.

^c Sex could not be determined on one of the animals in six conspecific double captures.

less than the average weight of deer mice captured alone ($\bar{X} = 20.3$ g., $t = 1.73$, $df = 80$). Of 14 double captures of deer mice in British Columbia, Sheppe (1967) reported that 13 involved two juveniles and the remaining capture a juvenile and an adult.

There was also a significant difference in the average weights of all voles comprising double captures as opposed to those taken alone. These data were then analyzed on a seasonal basis and apparently those double captures which occurred in July 1974 contained animals significantly lighter ($\bar{X} = 19.3$ g.) than the average weight of voles captured alone during this period ($\bar{X} = 37.0$ g., $t = 3.97$, $df = 58$). However, voles comprising double captures during August 1973 or October 1974 presumably entered the traps together, because the average weight of the lightest member of each pair ($\bar{X} = 28.8$ g.) did not differ statistically from the average weight of voles captured alone during these periods ($\bar{X} = 33.5$ g., $t = 1.09$, $df = 54$).

These results suggest that more than one factor probably was responsible for double captures of rodents. The degree of sociability (Getz, 1961, 1972; Petersen, 1975) undoubtedly is a factor, and my data indicate that juvenile male montane voles may forage or disperse together during late summer and fall, as may heterosexual pairs of Western harvest mice. At other times or considering other species, however, the light weight of individual (juvenile) animals and the lack of sensitivity of the trigger mechanism of traps must also be considered as a causative factor of double captures.

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Literature Cited

- Dunaway, P. B. 1968. Life history and population aspects of the Eastern harvest mouse. *Amer. Midl. Nat.*, 79: 48-67.
 Evans, F. C., and R. Holdenreid. 1943. Double captures of small rodents in California. *J. Mammal.* 24: 401.

- Getz, L. L. 1961. Home ranges, territoriality and movement of the meadow vole. *J. Mammal.* 42: 24-36.
- . 1972. Social structure and aggressive behavior in a population of *Microtus pennsylvanicus*. *J. Mammal.* 53: 310-317.
- Petersen, M. K. 1975. An analysis of multiple captures in several rodents from Durango, Mexico. *J. Mammal.* 56: 703-705.
- Sheppe, W. A. 1967. Habitat restriction by competitive exclusion in the mice *Peromyscus* and *Mus*. *Can. Field Nat.* 81: 81-98.

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