ACTA THERIOLOGICA
Vol. 22, 29: 377—395, 1977

Fragmenta Theriologica

A Seasonal Study of Two Livetrapping Techniques for Medium-Sized Mammals

Sezonowe badania dwóch sposobów odłowów żywych ssaków o średniej wielkości

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Davis P. B., 1977: A seasonal study of two livetrapping techniques for medium-sized mammals. Acta theriol., 22, 29: 377—380 [With 2 Tables].

Conventional and new prebaiting livetrapping methods for medium-sized mammals were tested simultaneously. Season, trap size and trapping method each had a significant ($P < 0.05$) effect on capture rate with no significant interaction between these variables. Highest mean capture rates were recorded with medium size traps and the prebaiting method.

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I. INTRODUCTION

Numerous methodologies for capturing and estimating the size of medium-sized mammal populations, from squirrels (*Tamiasciurus hudsonicus*) to raccoons (*Procyon lotor*), have been developed and tested (Taber & Cowan, 1969; Overton, 1969). Most data collected on medium-sized mammals are obtained with nonprebaited livetrapping techniques. Trap prebaiting has been employed by a few investigators in an attempt to increase capture rates (Nixon, *et al.*, 1975). There is presently a need for research that evaluates the effectiveness and efficiency of various trap sizes and trapping methods used in the collection of data for mammals of this size class (Ludwig & Davis, 1975). This study was undertaken from 1974 to 1975 with the specific objectives: (1) to develop an effective technique for livetrapping medium-sized mammals; (2) to compare effectiveness and efficiency of prebaited with conventional trapping methods; (3) to determine effectiveness of various trap sizes; and (4) to examine these techniques on a seasonal basis.

II. STUDY AREA AND METHODS

Ten field stations were located at 30-meter intervals in an agricultural-forest transition zone located in Ingham County, Michigan. The study area was between agricultural fields used for corn production and a 8.1-ha second-growth beech-maple (*Fagus grandifolia-Acer saccharum*) woodlot. One large ($25 \times 30 \times 80$ cm),

one medium (23 × 23 × 66 cm), and one small (15 × 15 × 48 cm) Tomahawk single-door collapsible live-traps were placed approximately 3 m apart at each station. Two methods of trapping were employed: a conventional method and a prebaiting method.

The conventional method consisted of traps at odd numbered stations baited with two ears of dried field corn lightly coated with peanut butter. Traps were set each morning at sunrise for 14 consecutive days in November, January, March and June. Due to vandalism, traps were rendered inoperable for two days in January.

Traps at even numbered stations were locked open and prebaited with several ears of dried field corn lightly coated with peanut butter. On the sixth and thirteenth mornings of each two week period, traps were set to operate normally.

Animals trapped were marked with a commercial Nyansol fur dye (Taber & Cowan, 1969) so that individuals could be recognized in subsequent captures.

An analysis of variance was performed to determine if season, trap size, trapping method or any combination of these parameters significantly ($P < 0.05$) effected capture rate. A Newman-Keuls multiple-range test (Zar, 1974) was utilized to determine if mean capture rate varied significantly ($P < 0.05$) with trap size or season.

The following assumptions were made in regard to the above methods: (1) trap stations were in the same habitat type and (2) at each station an animal had an equal opportunity to select each trap size.

III. RESULTS AND DISCUSSION

During the four trapping periods a total of 142 captures of five different species were recorded with both methods (Table 1). Medium-sized mammal species which were trapped included red squirrel (*Tamiasciurus hudsonicus*), fox squirrel (*Sciurus niger*), cottontail rabbit (*Sylvilagus floridanus*), opossum (*Didelphis marsupialis*) and raccoon (*Procyon lotor*).

Table 1

Seasonal trapping data for medium-sized mammals using conventional and prebaited methods during fall 1974 through summer 1975.

Trapping method	Conventional				Prebaited			
Season	F	W	Sp	Su	F	W	Sp	Su
Number of trap nights	210	180	210	210	30	15	30	30
Number of captures	11	11	34	38	10	6	17	15
Number of animals	11	9	26	32	9	5	11	15
Number of recaptures	0	2	8	6	1	1	6	0
Number of species	4	3	5	5	2	1	4	4
% capture rate in large traps	10	5	23	21.4	40	60	50	50
% capture rate in medium traps	5.7	8.3	20	22.9	40	40	80	80
% capture rate in small traps	0	5	6	10	20	20	40	20
% combined capture rate	5.2	6.1	16.2	18.1	33.3	40	56.7	50

Season, trap size and trapping method each had a significant effect on capture rate with no significant interactions occurring among them (Table 2). Mean capture rate in the fall was significantly lower than in the

spring and summer, but the same as in winter. Mean capture rates in winter, however, were not significantly lower than mean capture rates in spring or summer. There were no significant differences between mean capture rates in large and medium traps; however, the mean capture rate in small traps was significantly lower than in medium or large traps. The mean capture rate for the conventional trapping method was significantly lower than for the prebaiting method during all four seasons (Table 2).

The relationship between mean capture rate and season indicated that medium-sized mammals were least vulnerable to trapping in the fall. This decreased vulnerability was probably due to increased food abundance which was highest during this season.

Since no significant difference was detected between mean capture rates of large and medium traps the latter ordinarily would be preferable, because they are less expensive and easier to carry into the

Table 2

Analysis of variance of mean capture rate for species of medium-sized mammals in relation to season, size of trap, and trapping method.

Source of variance	Interaction	df	Mean squares	*F*-ratio
Season (A)		3	2,878.98	3.937*
Size (B)		2	3,850.99	5.266*
Method (C)		1	17,517.69	23.953**
	AB	6	649.10	0.888
	AC	3	634.90	0.868
	BC	2	401.15	0.549
	ABC	6	709.79	0.971
Error		96	731.33	
Total		119	965.75	

* Significant at $P < 0.05$. ** Significant at $P < 0.01$.

field. The significantly lower capture rates obtained with small traps probably were due to the physical dimensions of the traps and animals. The number of species captured with the prebaiting method was less in each season than the number captured with the conventional method (Table 2). However, each of the species caught with the conventional method was also captured with the prebaited method in at least one of the trapping periods.

The greater effectiveness of the prebaiting method may be due to the reward animals receive while going freely into prebaited traps. Such positive reinforcement may decrease an animals's wariness of entering a trap. Social facilitation may be a positive factor when one animal watches another's feeding behavior and adopts it. Scent of man may be a deterent decreased with the prebaiting method, since the trap or bait is not touched for several days.

Set up and removal time in the field were the same for both methods; however, prebaited traps were set and checked only twice during each trapping period. During each season, 15 field trips were required for the

conventional method, whereas only 5 trips were necessary for the prebaiting method.

This savings in time accompanied by increased capture rates indicate the prebaited method is both more effective and efficient than conventional livetrapping techniques.

Acknowledgements: The author thanks Dr. Thomas P. Husband of the Department of Fisheries and Wildlife for his criticism, advice and encouragement throughout the study. This study was partially funded by a Grant-in-Aid of Research from Sigma Xi, The Scientific Research Society of North America.

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Accepted, November 2, 1976.

Seasonal Cycles of Body Weight and Lipids in Richardson's Ground Squirrel, *Spermophilus richardsonii elegans*

Sezonowe wahania ciężaru ciała i poziomu lipidów u *Spermophilus richardsoni elegans*

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Zegers D. A. & Williams O., 1977: Seasonal cycles of body weight and lipids in Richardson's ground squirrel, *Spermophilus richardsonii elegans*. Acta theriol., 22, 29: 380—383 [With 1 Table & 1 Fig.].

Because of the significant linear correlation between body weight and lipid level, annual changes in body weight were related to a cycle in lipid for *Spermophilus richardsonii elegans*. Significant differences in mean weight between adult males and females were found both at emergence and immergence. Although lipid was not completelly depleted at emergence, both sexes exhibited sharp lipid losses immediately after emergence, which was probably due to increased energy expenditure during reproduction and to the minimal supply of food available at the beginning of the growing season.

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The importance of biomass and lipid cycles in small mammals becones more apparent as energy flow studies become increasingly common. The significance of these cycles is especially obvious in hibernators who,

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