The Relative Effectiveness of Two Size of Sherman Live Traps

Względna wydajność żywołówek różnej wielkości

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The choice of trap type is important in small mammal population studies. In this study, small Sherman live traps were found to be far more effective than large Sherman live traps in capturing the white-footed mouse, *Peromyscus leucopus*. The small Sherman live trap results were comparable to those found for Museum Special snap traps. The small Sherman live traps were also more likely to capture the uncommon species of small mammals present in the area.

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In most trapping studies, it is important to maximize the number of animals captured within a reasonably short time. In this regard, the general effectiveness of Museum Special snap traps over commercial rat and mouse snap traps in capturing small rodents was documented by Smith *et al.* (1971) and Weiner & Smith (1972). Museum Special snap traps were also found to be significantly more efficient than both the small (54×64×171 mm) and the large (75×75×227 mm) Sherman live traps (Wiener & Smith, 1972; Duran & Samz, 1973). Quast & Howard (1953) reported that the large Sherman live trap was much more effective than the smaller model. In fact, the large Sherman live trap appeared to compare favorably with the popular Longworth live trap (Morris, 1968; Krebs, 1964). While trapping for *Peromyscus* in western Virginia and utilizing both sizes of Sherman live traps, it was soon evident that the smaller model was vastly superior. To document this, we compared the effectiveness of the Museum Special snap trap and the two sizes of Sherman live traps in capturing *Peromyscus* and other small woodland mammals inhabiting this region.

Trapping took place between October 1974 and March 1975 in woodlands surrounding Blacksburg, Montgomery County, Virginia. The rolling terrain, 650 to 780 meters in elevation, is covered with varying mixtures and species of pine and oak: undergrowth frequently consisted of light to heavy concentrations of honeysuckle (*Lonicera* sp.), mountain laurel (*Kalmia* sp.), rhododendron (*Rhododendron* sp.), brambles (*Rubus* sp., *Smilax* sp.) and other brushy species. One line each of small Sherman live traps, large Sherman live traps, and Museum special snap traps was established. A fourth line had one trap of each type placed at every trapping station. Each pure line could theoretically be in a different habitat resulting in habitat, not trap type, affecting trapping success. Adjacent trap lines could also affect one line differently from

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another. A mixed line eliminates these variables, but raises the question whether one trap attracts a mouse while another captures it. Utilizing both line types at the same time hopefully allows a valid interpretation of the data. Trap stations were placed 12—15 meters apart, usually with 25 stations per line. Lines were separated from each other by distances of 25—30 meters. Traps were set in the afternoon and collected the following day; no area was trapped more than one night. The bait of rolled oats mixed with peanut butter (Beer, 1963) was placed on the rear portion of the trap treadles.

For the mixed line, 1518 trap nights (506 stations) were completed: 500 trap nights were completed for each of the pure lines, resulting in a total of 3018 trap nights for all traps during the duration of the experiment. A total of 227 small mammals were captured, with *P. leucopus* providing by far the most captures (Table 1). The large Sherman live traps showed very low trapping success. The small Sherman live traps and Museum Special snap traps were about equally efficient, but it appeared that the former were more efficient at capturing a diversity of

Table 1

Capture of small mammal species according to trap type.
A — snap trap. B — large Sherman trap, C — small Sherman trap

Species	Mixed lines			Pure lines		
	A	B	C	A	B	C
Peromyscus leucopus	40	4	39	68	2	65
Sorex fumeus			1			2
Blarina brevicauda			1			3
Ochrotomys nuttalli	1					
Clethrionomys gapperi			1			
Totals	41	4	42	68	2	70

mammals (*Sorex fumeus, Blarina brevicauda,* and *Clethrionomys gapperi*). The mixed line captured a total of 87 animals versus 68—70 captures in the pure Museum Special snap trap and small Sherman live trap lines. This difference may be due to several factors. The mixed lines were generally outside lines (as were the large Sherman live trap lines), therefore decreasing the effects of adjacent lines. Animals visiting a mixed trap line were possibly more likely to be captured during their inquisitive investigations than one investigating a trap station with one trap. Lastly, several cases of multiple captures per station were recorded.

In order to better understand the difference in trap efficiency, *Peromyscus* reaction-to-trap and trap sensitivity were investigated in the laboratory. A large or small Sherman trap was placed in a box arena approximately 45×60 cm in floor size. Twenty-five laboratory-maintained *Peromyscus leucopus* of various sizes were tested individually to each trap type. The normal procedure was to weigh the animal after which it was placed into the arena and observed for five minutes to determine its initial reaction to the trap. If by the end of the five minute period the mouse had not entered the trap during its exploratory movements, it was gently guided into the trap to find if its weight was sufficient to result in capture.

The reaction-to-trap observations, subjectively evaluated, showed no dramatic difference between hesitancy to enter and trap size. Usually a mouse investigated the arena and trap several times before entering the latter. A few, including several freshly captured individuals included in the sample, entered the trap almost immediately upon the release into the arena. The trap sensitivity results indicate that the large Shermans (several traps tested) generally did not capture the lighter (below 15 g) animals, nor were the traps consistent from one setting to the next. Sometimes, the trap would spring of its own accord, or capture a light animal one time, and immediately afterward not capture a heavier individual. This occurred at trigger sensitivities equal to or more sensitive than that used under field conditions. Several large noncollapsible Sherman traps were tested and appeared to be slightly more uniform in trap response than the large collapsible type, but still were not as efficient as the small Sherman trap. The small Sherman collapsible trap has been periodically used in the field and its efficiency seems to be comparable to that of the noncollapsible model.

The main difference in the two trap sizes that might account for the above findings appears to be the use of lighter gauge spring steel associated with the small Sherman trap treadle. The lighter gauge in the smaller trap results in less tension of the treadle trigger against the trap door, thus resulting in a more sensitive and consistent setting. Where the capture of young animals or species weighing 20—25 g or less is necessary, the small Sherman live trap should be chosen over the larger model. The large Sherman live trap could conceivably be modified by substituting a lighter gauge spring on the treadle mechanism, thereby allowing for successful capture of large and small animals.

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