

## A COMBINATION OF SHERMAN AND LONGWORTH TRAPS DIMINISHES OVERALL ERROR AND BIAS IN SMALL-MAMMAL INVENTORIES

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Sherman (H. B. Sherman, Inc., Tallahassee, Florida) and Longworth (Penlon Ltd., Oxford, U.K.) live traps are widely used in small-mammal inventories. Nevertheless, as Anthony et al. (2005) points out, “few studies have directly compared the effectiveness of these two popular models.” Both Sherman and Longworth traps are light-weight and resemble aluminum boxes. Some styles of Sherman traps fold, while the Longworth trap has an entrance tunnel that pushes in for storage. Some users find this feature preferable because “the separate tunnel and nest box permit the addition of food and cotton without being concerned about jamming the trigger, as with Sherman traps” (*Shrew Talk* 1(9), 19 July 1997, <http://members.vienna.at/shrew/shrewtalk=1-09.html>, accessed 11 January 2007). Each brand has a lever that trips as the animal enters the chamber, closing the trap door. The 2005 study by Anthony and others also deployed pitfall traps, which are generally believed to be more effective in catching small shrews than live traps, though Anthony et al. (2005) did not find this to be a valid assumption, particularly in the absence of drift fences. This fencing intercepts the movements of animals and guides them into traps, generally increasing capture rates (Corn 1994). For this study, investigators dug pitfall traps, consisting of two #10 cans (36 cm x 15 cm [14" x

5.9"]]) duct-taped together. At each of 25 stations, investigators laid out a combination of pitfall traps and three other styles of traps at each of 25 stations: Longworth traps (13.8 cm x 6.4 cm x 8.4 cm [5.4" x 2.5" x 3.3"]), small non-folding Sherman traps (17.0 cm x 5.4 cm x 6.5 cm [6.7" x 2.1" x 2.6"]), and large folding Sherman traps (23.0 cm x 7.7 cm x 9.1 cm [9.1" x 3.0" x 3.6"]). Small Sherman traps caught the most animals during this study; hence, the results indicate that trap-size dimensions did not present an obstacle to the species trapped during this study. Anthony et al. (2005) also discusses considerations such as "species-specific differences in capture rates," that is, particular traps preferentially captured certain species (e.g., Longworth traps were the most effective in capturing long-tailed shrews).

Researchers conducted this two-year (1996–1997) study in 12 grassland preserves in southern Wisconsin. Traps were pre-baited with 25-gram (0.88 oz) bags of peanut butter and left open for two days preceding the survey; trapping occurred over four consecutive nights. Investigators checked the traps once each evening and once each morning. However, when temperatures exceeded 27°C (81°F), they shut the traps (presumably to avoid animal mortality). Hence, for consistency, researchers analyzed only nocturnal data, which included the capture of nine different species, six of which were quantitatively sufficient for statistical analysis. These six species were long-tailed shrew (*Sorex* spp.), short-tailed shrew (*Blarina brevicauda*), western harvest mouse (*Reithrodonomys megalotis*), white-footed and prairie deer mice (*Peromyscus* spp.), meadow vole (*Microtus pennsylvanicus*), and meadow jumping mouse (*Zapus hudsonius*). Researchers made no distinction between white-footed mice (*Peromyscus leucopus*) and prairie deer mice (*Peromyscus maniculatus*) and combined masked shrew (*Sorex cinereus*) and pygmy shrew (*Sorex hoyi*) as long-tailed shrew because discrimination in the field of these species is difficult to impossible.

Long-tailed shrews made up the bulk of all captures, and the majority of trap deaths. For all species, trap mortality was lowest in large Sherman traps: 0% in the first year of the study, and 9.1% in the second year. In the second year of the study, researchers introduced new

Sherman traps

and capture rates increased with these traps. The difference in capture success may be a result of age and wear of the Sherman

traps used. Hence, trap age is likely an important consideration in small-mammal inventories and may "lead to

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potentially biased estimates of species capture rates.” Though the researchers tested each trap for functional reliability, the Sherman traps used in the first year had already been used for several seasons. The Longworth traps used were approximately 30 years old, so any differences in capture success in these traps between study years were negligible.

In addition to the significance of trap age, Anthony et al. (2005) concludes that Longworth and Sherman traps used in combination can diminish overall sampling error and yield less biased estimates of species composition than either trap type alone. This conclusion is similar to the findings of past comparisons (e.g., Kalko and Handley 1993; McComb et al. 1991) of live traps, snap traps, and pitfall traps, which suggest that “a combination of different traps is the best means for assessing overall composition and structure of small-mammal communities.”

## References

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