

COMPLETED PROJECT REPORT

Project Title: Indexing technique for vole abundance.

Research Agency: University of California - Davis

Principal Investigator: Whisson

Budget: \$56,496.00

Background:

This study assesses the use of chew cards or tracking tiles as a measure of relative abundance of meadow voles.

Objective: To develop, evaluate and compare potential indices that could be used as a measure of relative abundance of meadow vole populations. We will determine:

1. The optimal attractant for impregnating chew cards.
2. The placement of stations (random or regular) in the area to be assessed.
3. The measurements and statistical parameters for each index.
4. The relative reliability of methods compared to the apple slice index that although previously used as a standard is inadequate.

October - December 2002 For 4 known population densities (4, 16, 28, 40) of meadow voles, we tested chew cards soaked with canola oil, apple slices, and tracking tiles as indexing methods. Due to some unforeseen problems with the pens (predation of voles by raptors and feral cats, and some flooding) we need to repeat some of the testing. We intend using some covered pens that should not pose the same problems.

Chew cards were well accepted by individuals in cages and also by voles housed in small group cages. There was a significant correlation between percentage of cards chewed and group size. However, in 10 x 20 ft pens with up to 32 voles per pen, chew cards were mostly untouched by meadow voles. We suspect voles housed in cages were either chewing the cards out of boredom or using the cards as nesting material.

Wax blocks (50% paraffin, 50% steam-rolled oats) were consumed by meadow voles in all tests. Preliminary data analysis indicates a positive correlation between population size and the amount of wax block consumed.

Apple slices also were consumed by meadow voles in all tests. However, regardless of the size of the apple slice (up to half an apple was provided) or meadow vole population, in most tests the entire slice was consumed in one day. This confirms that apple slices can only provide a binary index (presence/absence) of meadow vole abundance.

Track plates: These were tested in the pen tests. We used two methods of indexing tracks – (a) track counts and (b) proportion of track plate covered with tracks (determined by scanning track plates and counting pixels (Corel PhotoDraw software)). Both of these measures were correlated with pen population size.

Trapping: We used snap traps set over a 4-day period to index voles as our final indexing technique. Number of individuals trapped was low in all pens and not related to population size.

Field tests were delayed by late storms but are now being conducted to confirm results from the pen tests. All data are being analyzed and a final report being prepared.

Summary:

A summary of results is provided below:

1. In laboratory and field tests, we developed and tested a variety of indexing methods for monitoring meadow vole populations. These included the apple slice index and trapping that are commonly used, as well as track plates, chew cards and nontoxic wax blocks.
2. Where possible we evaluated continuous and binary measurements for each technique. Continuous measurements provide an index that is more sensitive to small changes in populations.
3. The generalized index (GI) for each method is expressed as the mean of the daily means of observations at a number of stations. The index does not require stations to be independent of each other.
4. Wax blocks provided the most sensitive index measurements and are logistically the easiest to use. Further testing of these blocks and comparison with commercially-available monitoring blocks, in different habitat types and seasons is warranted.
5. Placement of indexing stations in a regular grid pattern was effective in indexing populations, and is not affected by observer bias (e.g., placing stations where there is vole activity, or attempts to randomly place stations).

Last Updated:

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