

Small Mammal Trapping Standard Operating Procedures

USGS Western Ecological Research Station SFBE

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Purpose/Objective:

Small mammals serve an important ecological role in tidal marshes as both primary consumers and prey items of carnivores, including raptors and many medium sized mammals (Manley et al. 2006). Sherman live traps are used to detect the presence and estimate the abundance of small mammals in tidal marshes. Each site will be flagged and trapped for 3 nights during the late summer. Traps are set before dusk and checked within three hours of sunrise the following morning to avoid overheating. Densities are reported as animals captured per trap night.



Salt marsh harvest mouse, San Pablo Bay, CA; photo by M. Bias.

Equipment:

Sherman live traps (7.7 x 9.0 x 23.0-cm)
Wood shingles
Rubber bands
Pin flags
50 m tape (for grid establishment)
Bait - dry bird seed mixture & crickets

Bedding - bulk polyester
Clear Plastic Bags (Ziplock OK)
Site maps with UTM grid
GPS Unit
Clipboard, data forms, pencils
Gloves, calipers, scale, ruler

Methods:

1. Tidal areas should not be trapped during times when high tides cover the marsh plain. Trap sites that are in water or at risk of flooding may be moved to the nearest dry land in the grid or skipped if necessary until the next survey period.
2. Sample for three consecutive evenings.
3. Traps are laid out in 10 trap transects or 5x5 grids depending on the site. Whether in transects or grids, traps are located 10m from one another.
4. Before setting out the traps, place labeled flags at each trapping site. Use UTM coordinates and old flags to locate positions used in previous years.
5. When setting out traps, place a rolled piece of polyester batting in the top rear and a few grams of bird seed mixture and a few dried crickets (for insectivores) in the bottom of the trap.
6. Make sure that trigger is set such that the trap closes with a sharp tap.
7. Place the trap on level ground or use a shingle as a base to place the trap in or on top of vegetation. Use a shingle to cover the trap and provide shade. Use a rubber band to attach the shingles to the trap if windy conditions are expected.
8. Open traps just before dusk, and be sure that no seed is blocking the trap from closing properly. Remember to leave a few pieces of seed on the treadle to lure

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mammals into trap before leaving.

9. Return the following morning and plan to check all traps within three hours of sunrise.
10. Record traps that are found closed but empty.
11. When you find an occupied trap, carefully empty the contents into a secure plastic bag.
 - a. Record the weight of the bag along with the trap and grid numbers on Small Mammal Trapping Datasheet using Code Key (Table 2).
 - b. Identify the species and whether it is a new or repeat capture
 - c. Take morphological measurements (gender, reproductive status, body length, tail length, left hind foot length, and left ear length).
 - d. Additional measurements will be recorded for the genus *Reithrodontomys* including tail width at 2 mm from the base of the tail, shape of tail tip, tail bi-coloration, ventral tail hair color, and ventral hair coloration pattern (Padgett-Flohr and Shellhammer 2002).
 - e. Captured individuals should be marked by fur clipping to identify recaptures.
 - f. After releasing the animal, make sure to tare the bag used to weigh the animal without losing any seed from the bag.

Data Analysis:

Analyses include a 0.5 trap night correction for sprung but empty traps (Nelson and Clark 1973) and data are presented as the number of new individuals captured per 100 trap nights (Table 1).

Table 1. List of small mammal species and abundance index (new captures per 100 trap nights) for each trapping year at Tubbs Setback restoration project, San Pablo Bay, CA (Woo et al. 2007).

Common name	Scientific name	2003	2004	2005	2006
California vole	<i>Microtus californicus</i>	1.39	0.56	0.83	3.33
House mouse	<i>Mus musculus</i>	1.11	0.28	4.17	1.67
Deer mouse	<i>Peromyscus maniculatus</i>	17.50	4.72	2.50	2.50
Salt marsh harvest mouse	<i>Reithrodontomys raviventris</i>	0.28		4.17	0.83
Norway rat	<i>Rattus norvegicus</i>			0.83	0.83

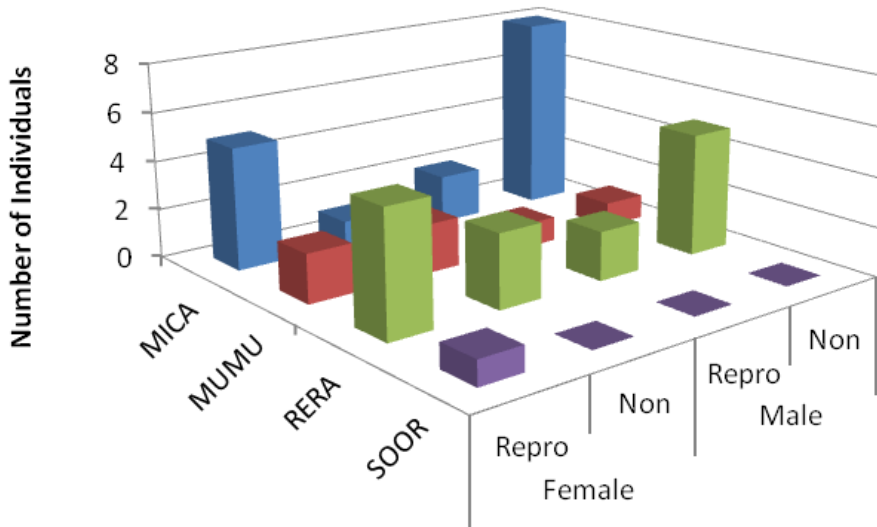


Figure 1. Abundance by gender and reproductive status per species.

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Table 2. Small mammal trapping datasheet code key

Species

MICA	Microtus californicus
MUMU	Mus musculus
PEMA	Peromyscus maniculatus
RANO	Rattus norvegicus
REME	Reithrodontomys megalotis
RERA	Reithrodontomys raviventris
RESP	Reithrodontomys species
SOOR	Sorex ornatus
UNSP	unidentified species (escaped)

N/R

N	new capture
R	recapture

Sex	male (M)/female (F)
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Repro

Males	S	scrotal
	N	non-scrotal
	A	abdominal
Females	P	pregnant
	MD	mammarys developed
	MG	mammarys developing
	PL	post lactating
	L	lactating
	E	in estrus
	N	non-reproductive
	O	vaginal opening is open/swollen
	C	vaginal opening is closed

Measurements (mm)

Body	body length
	tail
Tail	length
Foot	foot length
	ear
Ear	length

Age

J	juvenile
S	subadult
A	adult

Parasites/Disease

absent	0
present	1

Reithrodontomys		mm
TDIA	tail diameter at 20mm from base	0-2
TTIP	shape of tail tip	0-2
BIC	tail bicoloration	0-2
WHT	ventral tail hair color	0-2
Ventral	ventral hair color pattern	0-7

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References:

Manley, P.N.; Van Horne, B.; Roth, J.K.; Zielinski, W.J.; McKenzie, M.M.; Weller, T.J.; Weckerly, F.W.; Vojta, C. 2006. Multiple species inventory and monitoring technical guide. Gen. Tech. Rep. WO 73. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. 204 p.

Nelson, L. and F.W. Clark. 1973. Correction for sprung traps in catch/effort calculations of trapping results. *Journal of Mammalogy* 54(1):295-298.

Padgett-Flohr, G. E. and H. Shellhammer. 2002. Data collection protocols: surveying for the Salt Marsh Harvest Mouse (*Reithrodontomys raviventris*), California Vole (*Microtus californicus*) and other small mammals, Wetland Regional Monitoring Program, San Francisco Estuary Institute, Oakland CA.

Shellhammer, H. S. 1984. Identification of salt marsh harvest mice, *Reithrodontomys raviventris*, in the field with cranial characteristics. *Calif. Fish and Game* 70: 113-120.

Woo, I., J. Y. Takekawa, A. Rowan, R. J. Gardiner and G. T. Block. 2007. The Tubbs Setback Restoration Project: 2006 Final Report. Administrative Report, U. S. Geological Survey, Western Ecological Research Center, San Francisco Bay Estuary Field Station, Vallejo, CA. 70 pp.

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DATE _____

GRID

EAST

NORTH

[illegible]

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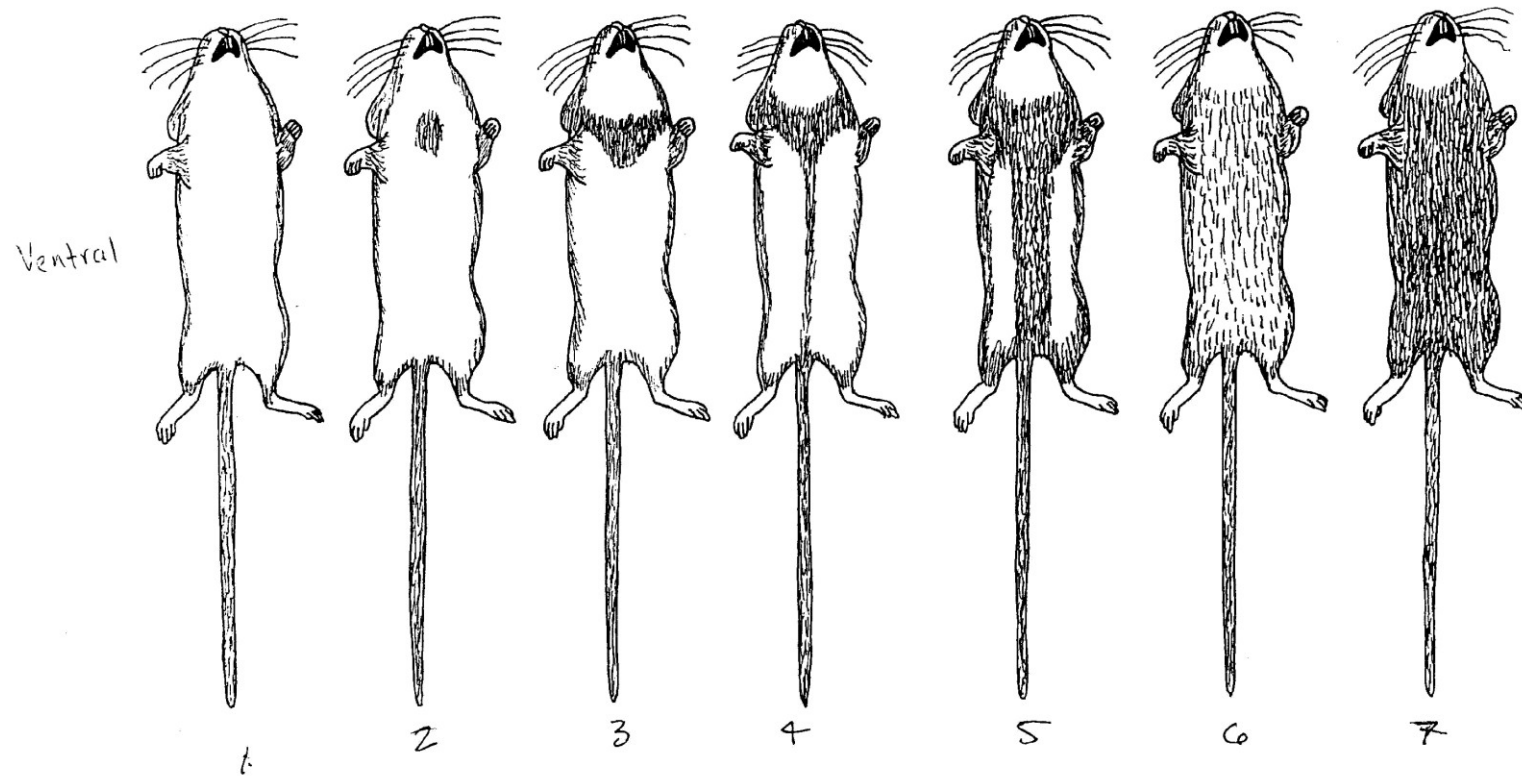


Table 1. Values assigned to tail traits.

	Trait	Value		
		0	1	2
TDIA	Tail at 20 mm from rump	2.1 or more	2.0 mm	1.9 mm or less
BIC	Tail pattern	unicolor	intermediate	bicolor
WHT	Ventral hairs on tail	tan	intermediate	white to grayish-white
TTIP	Tip of tail	blunt	intermediate	pointed

Figure 2. Characteristics key for *Reithrodontomys raviventri* (Shellhammer 1984).

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