

**M  
E  
A  
N  
E  
Y**

**Monitoring for Preble's Meadow Jumping**  
OSMP Studies 4433

*Study*



Meanev & Company

**Monitoring for Preble's Meadow  
Jumping Mice Along  
Goodhue and Davidson Ditches  
Off South Boulder Creek**

**Meanev & Company**

**Meaney & Company**  
**Carron A. Meaney, Ph.D.**  
**777 Juniper Avenue**  
**Boulder, Colorado 80304**  
**Phone: (303) 444-2299**  
**Email: meaney@colorado.edu**  
**FAX: (303) 442-0387**

---

2 March 2000

Cary Richardson  
City of Boulder Open Space  
7315 Red Deer Road  
Boulder, CO 80301

Dear Cary:

This letter serves as an addendum to the report entitled "Monitoring for Preble's meadow jumping mice along South Boulder Creek and four ditches" which was submitted to you in November 2000. In this letter I would like to address the management recommendations and suggestions for future research as related to Preble's meadow jumping mice along South Boulder Creek and affiliated ditches. These comments should be considered within the context of the fact that the land use management strategies employed by City of Boulder Open Space and Mountain Parks in the past 20 or more years appears to have done an excellent job of supporting mouse populations along the creek and affiliated ditches.

### **Management Recommendation**

Because of the clear evidence of intensive use by jumping mice of East Boulder Ditch and Enterprise Ditch, we suggest that care be taken with timing and extent of maintenance activities on these two ditches in particular as well as similar ditches with good habitat (see below). Specifically, we suggest that any maintenance work on the ditches avoid the active season and be conducted during the hibernation season, between November 1 and April 30. Risks to the mice at this time should be reduced, however care must be taken that dense stands of shrubs be safeguarded to the extent possible, as mice could be hibernating there. Maintenance activities on the ditches should be limited to the minimum needed to maintain flow and avoid changes to the character of the ditches in terms of vegetation. It is very important to maintain the complex vegetation structure, including dense stands of shrubs and the mixture of forbs and shrubs.

The ongoing weed management activities are to be encouraged. Cattle grazing, at current rates, appears not to cause problems in the northern half (north of South Boulder Road);

however, in the southern portion I recommend keeping the cattle out of the riparian corridor to facilitate willow and other shrub development there as occurs in the north.

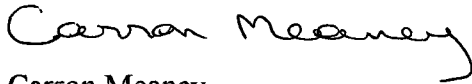
### **Future Research Needs**

We suggest continuing to evaluate potential use of other ditches by mice; in particular Goodhue and Davidson ditches appear to have good habitat for jumping mice and would be well worth surveying in order to more clearly determine the pattern of ditch use by jumping mice along the South Boulder Creek floodplain area. A large data gap has to do with where jumping mice hibernate both along ditches and in the wide floodplains of Boulder County in general, and South Boulder Creek in particular. This data gap leaves year round land use management for this species as a guessing game rather than relying on empirical data. Radio-telemetry is the best technique to answer these types of questions.

The ongoing population monitoring has been extremely useful in clarifying the fact that while these mice may fluctuate widely at a particular point in time and space, the overall population has maintained some degree of stability. We recommend continuing with this work.

Please feel free to contact me with any questions or issues you might like to discuss.

Sincerely,



Carron Meaney  
Research Associate,  
Denver Museum of Natural History and  
Curator Adjoint, University of Colorado Museum

MONITORING FOR PREBLE'S MEADOW JUMPING MICE

ALONG

GOODHUE AND DAVIDSON DITCHES

Off

SOUTH BOULDER CREEK

Meaney & Company  
Carron Meaney and Anne Ruggles

777 Juniper Avenue  
Boulder, CO 80304  
303-444-2299

Prepared for City of Boulder Open Space and Mountain Parks  
66 S. Cherryvale  
Boulder, Colorado

14 September 2001

## INTRODUCTION

There has been much interest in the use of irrigation ditches by Preble's meadow jumping mice (*Zapus hudsonius preblei*) in Boulder County and elsewhere. These small mammals are restricted to riparian corridors along the Front Range in Colorado, and certain ditches appear to provide the necessary habitat, whereas others do not. The type specimen for the subspecies was collected along an irrigation ditch near Loveland, Colorado, and in the course of population studies of the subspecies along South Boulder Creek over a number of years (Meaney et al. 2001, Meaney et al. 2000), we have found them in certain ditches but not in others. We had noted that suitable habitat for Preble's meadow jumping mice existed along two additional ditches. The present survey evaluated these two additional ditches that come off of South Boulder Creek for the presence of these mice: Goodhue and Davidson Ditches. Whereas the previous three years of small mammal research utilized mark-recapture techniques, the present study was a presence/absence survey.

## SITE DESCRIPTION

Goodhue and Davidson Ditches take water from South Boulder Creek. Goodhue Ditch is dated from 1873, and is thus a very junior ditch. Davidson Ditch has its head gate at Eldorado Springs Road, and is also a very junior ditch. Thus both ditches carry water for a relatively short period, as all senior ditches must be satisfied before water can be made available to the more junior ditches. We trapped both ditches on the City of Boulder Open Space and Mountain Parks property east of Cherryvale Road (Figure 1). A large irrigated pasture separates the two ditches.

Both ditches are well vegetated with a combination of trees, shrubs, forbs, and adjacent grasses. The ditches have an overstory of cottonwoods (*Populus deltoides*), and box-elder (*Negundo aceroides*), with some Russian-olives (*Elaeagnus angustifolia*) mixed in. The shrub component contained willow (*Salix exigua*), leadplant (*Amorpha fruticosa*), snowberry (*Symphoricarpos occidentalis*), chokecherry (*Padus virginiana*), and skunkbrush (*Rhus trilobata*). Forbs include mullein (*Verbascum thapsus*), dandelion (*Taraxacum officinale*), wild rose (*Rosa woodsii*), yarrow (*Achillea* sp.), poison ivy (*Toxicodendron rydbergii*), curly dock (*Rumex crispus*), and lupine (*Lupinus* sp.). Grasses include dropseed (*Sporobolus* sp.), little bluestem (*Schizachyrium scoparium*), western wheatgrass (*Pascopyrum smithii*), and horsetail (*Equisetum* sp.).

## METHODS

To continue the trapping schedule we had followed the past four years, and for better comparison, we conducted trapping the third week of June. On Goodhue Ditch, 148 traps were placed; and on Davidson Ditch, 147 traps were placed; this is a total of 1180 trap nights. All captured small mammals were identified, sexed, and marked with ink or hair-clipping. Jumping mice were sexed, aged, weighed, and color-marked so that we could

keep track of the specific individuals and their recaptures. All jumping mice were aged as adults due to the June capture date at which time only adults are found (Nichols and Conley 1982).

This survey was conducted in accordance with U.S. Fish and Wildlife Service "Interim Survey Guidelines for Preble's Meadow Jumping Mouse", revised June 15, 1998. Transects were laid out as one line of traps, on the conjoining side of each of the two ditches. On each transect line, traps were placed 5 m apart, and tagged and numbered with survey tape. Polyester batting and bait (horse sweet feed, a mixture of oats and other grains with molasses) were placed in each trap.

Traps were placed out on the afternoon of 18 June 2001; they were checked at 6:30 A.M. each morning for four mornings, and closed after processing any small mammals captured. They were reopened around 5:00 P.M. each afternoon, and run through 22 June. Closing them during the day results in reduced mortality as no animals are held captive during the warm days or through a 24-hour period. Protocol followed the "Acceptable field methods in mammalogy: preliminary guidelines approved by the American Society of Mammalogists" (Journal of Mammalogy, Supplement to Volume 68, No. 4, 1987).

## RESULTS AND DISCUSSION

On Goodhue Ditch, 31 small mammals representing three species were captured: 5 house mice (*Mus musculus*), 12 deer mice (*Peromyscus maniculatus*), and 14 Preble's meadow jumping mice (Table 1). On Davidson Ditch, 23 small mammals representing four species were captured: 2 meadow voles (*Microtus pennsylvanicus*), 19 deer mice, 1 western harvest mouse (*Reithrodontomys megalotis*), and 1 Preble's meadow jumping mouse (Table 2). With both ditches combined, there were a total of 77 captures (54 individuals and 23 recaptures). Out of 1180 trap nights, the capture rate is 6.5 percent. Jumping mice represented 32 percent of the captures on Goodhue Ditch and 2 percent of the captures on Davidson Ditch, or 21 percent of captures for both ditches combined, a high proportion.

This study shows that Goodhue Ditch is very much occupied by Preble's meadow jumping mice. With only one capture, Davidson Ditch is less clear. We know from the studies along South Boulder Creek that a given site can be occupied one season but not the next (Meaney et al. 2000). Thus it is unclear at this time whether Davidson would be intensely occupied in a subsequent year, or is only used occasionally as was the case in June this year. It is interesting that, considering only native small mammals, the occupied Goodhue Ditch had only two species of small mammals whereas Davidson Ditch had four.

Capture rates appear to be low this year, as we have found in the montane portions of Boulder County and in Pike National Forest (Meaney & Company 2001a, Meaney and Company 2001b). Similar low capture rates were found this year as well in Comanche

National Grassland (Cheri Jones, personal communication). Although the exact reasons for this are not known, it may be due to a dry summer in 2000 combined with low snow cover over the winter and a late, wet snowstorm in June 2001. Furthermore, small mammals are known to fluctuate in numbers in time and space.

In 2000, we captured 35 jumping mice on Enterprise Ditch with only 50 traps (200 trap nights), and 15 animals on East Boulder Ditch, also with 50 traps. No small mammals were captured on Schearer Ditch and only 7 deer mice were captured on Marshalville Ditch. The captures of jumping mice were lower on Goodhue and Davidson Ditches than on Enterprise or East Boulder Ditches, although this is difficult to compare in light of the comparison across different years.

All of the jumping mice captured were adults, as juveniles would not be surface-active yet and are typically not caught prior to July 7 (Nichols and Conley 1982). The details for each of the 15 individuals are shown in Table 3. The first individual captured, a male, weighed only 12 g. This low weight for an adult is indicative of weight loss during hibernation that has not yet been regained since emergence. Of the 15 jumping mice caught, there was only one recapture, itself a low rate. Most (11 of 15) were reproductive, indicated by descended testes for the males or nipples visible for the females.

In previous studies we found a pattern of intense jumping mouse use of certain ditches (East Boulder and Enterprise), and no use of others (Schearer and Marshalville). We had surmised that this was related to the seniority and concomitant flow season in the occupied ditches. However, Goodhue Ditch has a late appropriation date (1873, not senior) but is occupied. The present study indicates that other factors must also be involved.

We present potentially relevant characteristics of ditches that have been trapped along South Boulder Creek and whether they are occupied in Table 4. The occupied ditches (East Boulder, Enterprise, Goodhue, Davidson, and Dry Creek Ditches) all have the following characteristics:

- Adjacent upland grasslands
- Rich and complex plant communities
- A well-developed shrub component
- A low level of ditch maintenance

A long flow season more closely mimics a natural creek and seems likely to be an important factor. But surprisingly, two of the occupied ditches (Goodhue and Davidson) don't have long flow seasons. Jumping mice are relatively vagile, and may well disperse when the water dries up; determination of where they go would be of considerable interest. The ditch capacity and the average, maximum, and minimum number of days of flow also are shown in Table 4, and were thought to be possible measures of flow season. However, none of these characteristics correlate well with whether a ditch is occupied.

The unoccupied Schearer Ditch has steep banks, few grasses and forbs, no shrubs, and a high water table with saturated soils. Marshalville Ditch does have well-defined banks and patches of shrubs, but the water flow is erratic and there are few grasses or forbs; the water table appears variable. We included Dry Creek Ditch (also known as New Dry Creek Carrier or New Dry Creek Ditch) in Table 4. City of Boulder Open Space staff had captured jumping mice on this ditch south of Baseline Reservoir in the mid-to-late 1990s. We conducted a presence/absence survey in 1998 and did not find them along a north-south stretch on the east side of Baseline Reservoir (Meaney 1998). In this north-south section, the banks are very steep and plant diversity is low.

In summary, the characteristics of seniority, physical ditch capacity, and number of days of flow don't appear to be factors tied to presence of mice, at least not as stand-alone factors. Banks that are sloping rather than steep and eroded would appear to present an optimal topography, as is the case for East Boulder Ditch and at least parts of Goodhue Ditch. However, Enterprise Ditch has very steep banks and the mice were very much present. Uplands on adjacent lands with good grasses, high plant species richness and presence of shrubs appear key. Some period of saturation does not seem to present a problem. The level of ditch maintenance seems to be important; it occurs in five occupied ditches and not in the two unoccupied ones. The assessment of this characteristic was very qualitative. Development of categories to better define ditch maintenance would be of use. In this report, we gauged "low ditch maintenance" by the lack of disturbed or bare soil and the presence of well-developed vegetation.

Using the seven ditches described in Table 4, the qualities of high plant species richness, good upland grasslands with some saturation, shrubs present, and a low level of ditch maintenance appear closely tied with the presence of jumping mice. These are qualities known to be associated with good habitat. More surprising is the seeming lack of importance of a long period of flow and gently sloping banks, qualities that mimic a perennial stream. But they are not always characteristic of the occupied ditches. Thus some characteristics appear to be more predictive but others may have compensating factors. In relation to flow, it is also possible that the mice move elsewhere as the ditch dries up. Another consideration is the fact that a particular ditch may be occupied in certain sections and not in others. Dry Creek Ditch is occupied south of Baseline Reservoir, but not east of it. We are unfamiliar with what, if any, the habitat distinctions are between these two stretches of the ditch. Schearer Ditch contains some suitable habitat at its confluence with South Boulder Creek; it could well be occupied at that point but not where it was trapped just east of Cherryvale.

## **MANAGEMENT AND RESEARCH NEEDS**

Because of the clear evidence of intensive use by jumping mice of certain ditches with high population estimates and capture rates, such as East Boulder Ditch, Enterprise Ditch, and Goodhue Ditch, we suggest that care be taken with timing and extent of maintenance activities. Specifically, we suggest that any maintenance work on the ditches avoid the active season and be conducted during the hibernation season, between November 1 and



April 30. Direct risks to the mice at this time should be reduced. However care must be taken that dense stands of shrubs be safeguarded to the extent possible, as mice could be hibernating there and these represent very important habitat components during the active season as well. Maintenance activities on the ditches should be limited to the minimum needed to maintain flow and avoid changes to the character of the ditches in terms of vegetation. It is very important to maintain the complex vegetation structure, including dense stands of shrubs and the mixture of forbs and shrubs.

The ongoing weed management activities are to be encouraged. Cattle grazing, at current rates, appears not to cause problems in the areas where the grazing regime or fencing serve to protect the riparian vegetation. We recommend keeping the cattle out of the riparian corridor to facilitate willow and other shrub development, or to allow them there only for very brief periods so that vegetation is not damaged.

An evaluation of ditch maintenance activities and scheduling on Open Space and Mountain Parks properties would be useful to pinpoint problems ahead of time, such as when maintenance activities are to be anticipated. A large data gap has to do with where jumping mice hibernate along ditches. Do they use the vegetated banks, or do they move to distant or drier pockets of cover? This data gap leaves year-round land use management for this species difficult due to a lack of empirical data.

## REFERENCES

Meaney, C. 1998. Survey for Preble's meadow jumping mice on Dry Creek Trail, City of Boulder Open Space, Boulder County, Colorado. Conducted for City of Boulder Open Space, Boulder, Colorado. 19 November 1998.

Meaney, C.A., A. K. Ruggles, N.W. Clippinger, and B. Lubow. 2000. Monitoring for Preble's meadow jumping mice along South Boulder Creek and four ditches. Prepared for City of Boulder Open Space, 6 November 2000.

Meaney, C.A., A.K. Ruggles, N.W. Clippinger, and B.C. Lubow. 2001. The impact of recreational trails and grazing on small mammals in the Colorado piedmont. Submitted to *The Prairie Naturalist*, February 2001.

Meaney & Company. 2001a. Survey for Preble's meadow jumping mice, Trout Creek at Rainbow Falls, Manitou Experimental Forest, Pike National Forest. Prepared for District Ranger, Pikes Peak Ranger District, Colorado Springs. 30 July 2001.

Meaney & Company. 2001b. Survey for Preble's meadow jumping mice, Trail Creek, Manitou Experimental Forest, Pike National Forest. Prepared for District Ranger, Pikes Peak Ranger District, Colorado Springs. 31 July 2001.

Nichols, J.D., and W. Conley. 1982. Active-season dynamics of a population of *Zapus hudsonius* in Michigan. *Journal of Mammalogy*, 63:422-430.

Table 1. Total individual captures of small mammals on Goodhue Ditch (South Boulder Creek System), Boulder, Colorado. 18-22 June 2001.

Species	Adult Male	Female	Subadult Male	Female	Juvenile Male	Female	Total Male	Female	Unknown	Total All
<i>Mus musculus</i> House Mouse	1	2	0	0	0	0	1	2	2	5 (3)
<i>Peromyscus maniculatus</i> Deer Mouse	3	4	2	1	1	0	6	5	1	12 (12)
<i>Zapus hudsonius preblei</i> Preble's Meadow Jumping Mouse	9	5	0	0	0	0	9	5	0	14 (1)
Total										31 (16)

All values based on 148 traps and 592 trap nights.  
 26 closed traps, leaving 88% of traps unsprung.  
 Values in parentheses ( ) indicate recaptures.

Table 1. Total individual captures of small mammals on Davidson Ditch (South Boulder Creek System), Boulder, Colorado. 18-22 June 2001.

Species	Adult		Subadult		Juvenile		Total		Total All
	Male	Female	Male	Female	Male	Female	Male	Female	
<i>Microtus pennsylvanicus</i> Meadow Vole	2	0	0	0	0	0	2	0	2
<i>Peromyscus maniculatus</i> Deer Mouse	5	4	5	3	0	0	10	7	19 (6)
<i>Reithrodontomys megalotis</i> Western Harvest Mouse	1	0	0	0	0	0	1	0	1 (1)
<i>Zapus hudsonius preblei</i> Preble's Meadow Jumping Mouse	0	1	0	0	0	0	0	1	1
Total									23 (7)

All values based on 147 traps and 588 trap nights.  
9 closed traps, leaving 93% of traps unsprung.  
Values in parentheses ( ) indicate recaptures.

Table 2. Dates of captures, reproductive condition, and color marking of Preble's meadow jumping mice on Goodhue and Davidson Ditches, Boulder, Colorado. 19 - 22 June 2001.

ID	19 June	20 June	21 June	22 June
Blue	male/12g, N			
Blue/orange		female/20g, N		
Orange		male/16g, N		
Pink			male/18g, R	
Pink/green			male/17.5g, R	
Pink/orange			male/16.5g, R	
Black/pink			male/17g, R	
Pink/green/ orange			female/18g, R nipples visible	
Black/pink/ green			female/18.5g, R nipples visible	
Pink/blue			female/21g, R nipples visible	female/23g, R nipples visible
New				female/22g, N
New				male/20g, R
New R				female/18.5g, nipples visible
New				male/?g, R
New				female/21g, R nipples visible

Note: all animals are adults.  
R = Reproductive; N = Non-reproductive.

Table 3. Characteristics of irrigation ditches that have been trapped for Preble's meadow jumping mice. All take water from South Boulder Creek, Boulder, Colorado.

Characteristic	DITCHES						
	East Boulder Ditch	Enterprise Ditch	Marshalville Ditch	Scheerer Ditch	Goodhue Ditch	Davidson Ditch	Dry Creek Ditch (New Dry Creek Carrier)
Long flow season? Average flow dates	Y 4/28 - 9/15	Y 4/13 - 9/15	N ?	N 5/22 - 9/15	N ?	N 5/16 - 7/9	Y
Appropriation Date (1800s)	4/62	2/65	6/65	6/60	6/73	4/72	No water rights
Physical Ditch Capacity (cfs)	24	35	40	26	75	100	?
Banks somewhat sloping and vegetated	Y, banks shallow, 2 ft or so	N, steep banks	Y	N	Banks intermediate, 3-15 ft	Steep banks, 15 ft in most places	Steep cut banks, Gently sloping in parts
Plant species richness	Y	Y	N	N	Y	Y	Variable
Uplands with good grass, degree of saturation	Y, saturated at times	Y, saturated at times	Y, saturated	Y, saturated	Y, saturated at times	Y, saturated at times	Y, not saturated
Shrubs present	Y	Y	Y	N	Y	Y	Y
Low level of ditch maintenance?	Y	Y	N	N	Y	Y	Y
Average number of days water run	125	98	56	88	41	45	?
Max number of days water run	175	215	95	155	71	73	?
Min number of days water run	78	27	12	N/A	5	9	?
Comments				Has excellent jumping mouse habitat where it comes off SBC	Hayfield adjacent, mowed to within 15-20 ft	Hayfield adjacent, mowed to within 15-20 ft	Transports water from SBC to channel of Dry Creek
Occupied?	Y	Y	N	N, although M. Bakeman caught mice close by	Y	Y, but only 1 capture in 588 trap nights	Y south of Baseline Reservoir N east of Baseline Reservoir

APPENDIX

U.S. FISH AND WILDLIFE SURVEY FORM

Z. h. preblei found? Yes  No  Dates of Survey 15 June - 22 June

Surveyors: Mirony, etc.

Organization/Company: Mirony, etc.

Full Name(s): Anne Ruggles Lamm Whitmore & Collin Ahrens

Location: Caroline Sudbay, Melissa, Red-Elkhart, Tunny Gerson, Amanda Smith, Souya Skobacka

Descriptive Site Name (creek, nearby road intersection, etc.): Goodhue Ditch / Davidson Ditch

Lawrence County, Boulder, Elevation 1677m (5502ft)

1/4 Section(s) Wild 11/4 Township(s) 15 Range(s) T04

UTM Coordinates, Zone 13 North: Goodhue 4981904 Easting 4924199

Directions to Location: Baseline E to Churnvale. S on Churnvale across hwy 34

Land Ownership: n. 0.4 km. to open space gate. Ditch 15m E side of gate just west gate

General Habitat Description: wet meadow / Plains P. prairie

Dominant Plant Community: orchard grass, meadow fescue / milkweed, black root willo

Drainage Type: Perennial Stream, Ephemeral Stream, Pond/Lake, Ditch

Trapping Information: Goodhue - 9470 Davidson - 9870

Type of Traps: Sherman live Type of Bait: sweet horse % Available (unsprung)

Weather conditions prior to and during survey: 100% to 50% highs in 80's / no rain

Associated Animal Species: (especially urban predators, rats, house mice) house mice, blue mice, plains harvest mice

Sketch of surveyed area showing traplines, specific area disqualified (can be done on required U.S.G.S. map of site if appropriate) see attached

Preble's Data:

Number of Preble's trapped or seen: 15

Distance from water (m) Sex (m/f) Evidence of repro. \* Weight (grams) Marked or tagged?

ID	Sex	Weight (g)	Marked	Tagged
1	♂	3.5m	not marked	permanent
2	♂	3.5m	not marked	permanent
3	♀	3.5m	not marked	permanent
4	♀	3.5	not marked	permanent

Ditches 2001

5.	3.5m	♂	repro.	17.5g	not marked permanently
6.	3.5m	♂	repro	16.5g	"
7.	3.5m	♂	repro	17.5g	"
8.	3.5m	♀	repro.	18.5g	" (swollen vulva)
9.	3.5m	♂	repro	18.5g	"
10.	3.5m	♀	repro	21g	" (nipples visible) (swollen vulva)
11.	3.5m	♀	not repro	18.5g	"
12.	3.5m	♂	repro	20g	"
13.	3.5m	♀	repro (swollen vulva & nipples visible)	22.5g	"
14.	3.5m	♂	repro	nowt.	"
<del>15.</del>	<del>3.5m</del>				

\* captured 1st day / Recap Day 4  
20g                      24g

Davidson Ditch

6m	♀	repro nipples visible "pear shape"	26g	not marked permanently
----	---	--	-----	------------------------



Evidence of disease, predation or injury none

(Submit injury/mortality form if appropriate)

Genetic Material Obtained? Yes \_\_\_\_\_ No  Forwarded to \_\_\_\_\_

Specimen(s)? Yes \_\_\_\_\_ No  Forwarded to \_\_\_\_\_

(SUBMIT THIS FIELD DATA FORM WITH THE SURVEY REPORT)

*Zapus hudsonius preblei* Injury/Mortality Documentation

NA

Goodhue Ditch

Found dead

Found severely injured, euthanized

Slightly injured, returned to wild

Died during handling

Date/Time: \_\_\_\_\_

Location: \_\_\_\_\_

Weather Conditions: \_\_\_\_\_

Approximate Time Trap Set: \_\_\_\_\_

Time Trap Checked: \_\_\_\_\_

Field Technician(s) Present: \_\_\_\_\_

Information: \_\_\_\_\_

Species: \_\_\_\_\_

PIT TAG Number: \_\_\_\_\_

Weight (g): \_\_\_\_\_

Total Body Length (mm): \_\_\_\_\_

Tail Length (mm): \_\_\_\_\_

Hindfoot Length (mm): \_\_\_\_\_

Ear Length (mm): \_\_\_\_\_

Sex: \_\_\_\_\_

Reproductive Condition(s): \_\_\_\_\_

Description of Injury: \_\_\_\_\_

Details of Probable Reasons for Injury or Mortality: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Davidson Ditch



Signature of Technician(s): Anne K. Puggis Callan  
Lauren J. Whittemore

Heather Albin

