Survey for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) for the Bureau of Land Management, Casper Field Office, Wyoming, 2001

Prepared by:

Donna S. Ehle, Biologist
And
Douglas A. Keinath, Zoology Program Manager
Wyoming Natural Diversity Database
University of Wyoming
P.O. Box 3381
Laramie, Wyoming 82071-3381
(307) 766-3013
dsehle@uwyo.edu
dkeinath@uwyo.edu

Prepared for:

Willie Fitzgerald
Wildlife Biologist
Bureau of Land Management
Casper Field Office
2987 Prospector Drive
Casper, Wyoming 82604-2968

August 2002

Table of Contents

Survey for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) for the Bureau of Land Management, Casper Field Office, Wyoming, 2001

Executive Summary

The purpose of the survey was to determine the presence or absence of the Preble's meadow jumping mouse (*Zapus hudsonius preblei)* on BLM land with potentially favorable habitat. Based on minimum selection requirements that included habitat of mediocre quality, 12 discrete locations were sampled. Potential survey locations were excluded based upon the following negative habitat indicators: 1) short grass cover (less than 8 inches), 2) low vegetation density, 3) cattail (*Typha latifolia*) dominance, or 4) no water in the streambed accompanied by at least one of the other 3 negative habitat indicators. Four jumping mice (*Zapus* sp.) were captured at one location. No jumping mice were captured at the other locations. A total of 91 other small mammals were caught, including deer mice (*Peromyscus maniculatus*), voles (*Microtus* spp.), shrews (*Sorex* spp.), a harvest mouse (*Reithrodontomys* spp.), and a Bushy-tailed woodrat (*Neotoma cinerea*). The two successive dry years of 2000 and 2001 may be the cause of low capture rates of all small mammals by WYNDD personnel and other field workers trapping small mammals in eastern Wyoming.

Introduction

Preble's meadow jumping mice (*Zapus hudsonius preblei*; PMJM) were listed as Threatened under the U.S. Endangered Species Act in May 1998 (USFWS 1998). PMJM are thought to generally occur in dense or brushy riparian areas east of the Front Range in Wyoming and Colorado. A final special rule announced in May 2001 and effective for 36 months allows limited rodent control and landscape and structure maintenance, as well as existing agricultural activities and water uses (USFWS 2001a). A proposed amendment to the special rule would allow for limited noxious weed control and ditch maintenance (USFWS 2001b).

Four species of jumping mice occur in North America (Figure 1). Two of these species occur in Wyoming: the western jumping mouse (*Zapus princeps*) and the meadow jumping mouse (*Zapus hudsonius)*. There are 5 subspecies of meadow jumping mice, but only the Preble's meadow jumping mouse (*Zapus hudsonius preblei*) occurs in southeast Wyoming, along with the western jumping mouse. The ranges of the two mice are adjacent and likely overlap in southeast Wyoming (Figure 2). Western jumping mice are generally thought to occur in subalpine and montane zones. Meadow jumping mice are thought to occur at lower elevations in foothill and prairie riparian areas (Beauvais 2001). However, these zones intermingle along the relatively gradual front of the Laramie Range. Past genetic testing has successfully differentiated between *Zapus hudsonius* and *Zapus princeps* in Colorado, but it appears that hybridization has likely occurred in Wyoming (Riggs et al. 1997, Pague and Grunau 2000, Schorr 2001 in Beauvais 2001). Attempts to define morphological differences between western jumping mice and PMJM are currently underway (Mary Jennings, USFWS, pers. comm. in Keinath 2000).

Methods

Site Selection

BLM employees initially identified potential survey sites using wetland maps. During initial field visits, WYNDD employees eliminated some sites based on low vegetation density, short grass height (approximately 8 inches or less), a predominance of cattails, or lack of water in the streambed accompanied by one of the aforementioned negative habitat indicators. While high density of tall grasses or willows are considered positive indicators of favorable habitat, sites lacking willows or having moderate grass density or height were also surveyed. Most initial site visits were conducted in late June. Other site visits were conducted as time and proximity permitted.

Twelve stream sections were sampled out of a total of 38 discrete stream sections and ponds. A complete list of locations (in order by parcel) and reasons for survey or no survey are listed in Table 1. Two sub-parcels in Parcel 12 (T21N, R69W, Section 30, SWNE and T21N, R69W, Section 19, NWNW) were surveyed based on grass height present in late June, despite low grass height present when surveys were conducted in August. A State ¼ ¼ section one half mile downstream from Parcel 1 was surveyed in place of the original BLM ¼ ¼ section. This was done because vegetation along the stream in the original Parcel 1 (T19N, R65W, S24, NENW) consisted of herbaceous vegetation that had been grazed low (no more than 15 cm tall) by mid-June, and the State ¼ ¼ section one quarter mile downstream (T19N, R65W, S24, NENW) contained dense, tall herbaceous vegetation and some willows and cottonwoods**.** Two adjacent parcels (T21N, R68W, S8, W2NW and T21N, R68W, S5, N2S2) were not surveyed due to both inaccessibility and lessee concerns that a 4-wheeler might start a fire in an area used as winter range. BLM Officials assented to the lessees' request that surveys not be conducted for those reasons, in addition to the impracticality of accessing the site.

Most parcels identified by the BLM for potential surveys were ¼ ¼ sections. Within 3 parcels that were surveyed, a short section of stream only crossed a small corner of the ¼ ¼ section. Because these stream segments were so short (50-100 m long), it was difficult to reach the desired number of trapnights given the constraints of time and proximity to other sites that could be surveyed simultaneously. Streams within 2 parcels formed the boundary between BLM and private land, and only the BLM side of the stream was surveyed. Due to general difficulty obtaining permission to cross private land in order to reach the BLM parcels, we did not attempt to gain permission to survey on private land.

Field Surveys

Field surveys were conducted as per U.S. Fish and Wildlife Service guidelines (U.S. Fish and Wildlife Service 1999) in riparian areas of BLM parcels managed by the Casper Field Office. At each location, two parallel rows of 40 traps were placed on each side of the stream. Within each row, traps were placed 5 m apart. In cases of extremely short stream segments (approximately 50-100 m long), traps were placed 2 m apart. One row was placed directly alongside the creek, and the second row was no more than 10 m from the creek. Traps were filled with polyester bedding material and baited with three-way feed.

When raccoons tampered with traps the first night of trapping, a minimum of one Tomahawk raccoon trap was placed on each side of the stream. Captured raccoons were transported out of the survey area. All tripped traps, which included animal captures and traps tripped for unknown reasons, were recorded.

Results and Discussion

Four jumping mice were caught at one survey location: Corduroy Creek in Parcel 17 (T28N, R74W, Section 9, SWNW; Figures 35-39). No other jumping mice were caught. WYNDD personnel collected one voucher specimen and took DNA samples from the other three mice and delivered them to the U.S Fish and Wildlife Service, Cheyenne, Wyoming.

The habitat in which the jumping mice were caught in this survey does not match the model of PMJM habitat consisting of dense willows or tall, dense herbaceous vegetation. Habitat where the jumping mice were caught on Corduroy Creek consisted of a dense aspen overstory with occasional subalpine fir. The herbaceous understory was moderately dense. The primary reason for sampling this location was that it appeared to be unlike any of the other survey sites. The elevation of this site is about 7800 feet, higher than the other sites. Cows were present in the BLM parcel at least one day when surveys were conducted (14 August to 16 August 2001), and grass height was generally no more than 40 cm tall. Common juniper was scattered in the understory. A fair amount of coarse woody debris (likely aspen) was present in the stand and alongside the creek. The ground coming away from the creek on both sides was flat within the riparian corridor, which was approximately 10 m wide. A large rock formation was from 2-5 m from the creek on the north side and continued along the stream for the distance that it ran through the BLM parcel. Overall, the site appeared mesic, despite only moderate grass density in the understory.

A total of 91 small mammals other than jumping mice was caught. Of these, 50 were deer mice (*Peromyscus maniculatus*), 37 were voles (*Microtus* spp.), 1 was a harvest mouse (*Reithrodontomys* sp.), 2 were shrews (*Sorex* spp.), and one was a Bushy-tailed woodrat (*Neotoma cinerea*; Table 2). Total trapnights is 5345. Total net trapnights is 5058. Total net number of trapnights reflects trapping effort and is calculated by subtracting one-half trapnight from the total for each trap that was tripped without capturing an animal or caught an animal other than a jumping mouse. One-half trapnight represents the average amount of time that the trap was available to catch a jumping mouse, because it is unknown when the trap was tripped during the night (Beauvais and Buskirk 1999).

The combined dry years of 2000 and 2001 may account for low capture rates of all small mammals in this survey. Other field workers conducting (non-Preble's-specific) trapping surveys in eastern Wyoming also experienced low capture rates (Eric Everett, pers. comm.).

Acknowledgments

Thanks to George Soehn of the Bureau of Land Management Casper Field Office. Also, thanks to Jamie O'Dell for help with field work.

Literature Cited

Beauvais, Gary P. 2001. Preble's meadow jumping mouse (*Zapus hudsonius preblei*) in Wyoming: Status report, July 2001.

Beauvais, Gary P. 1998. Survey for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) on F.E. Warren Air Force Base, Wyoming, September 1998.

Beauvais Gary P. and Steven W. Buskirk. 1999. Modifying estimates of sampling effort to account for sprung traps. Wildlife Society Bulletin 27(1): 39-43.

Pague, C. and L. Grunau. 2000. Factbook on the Preble's meadow jumping mouse (*Zapus hudsonius preblei*): 9 January 2000 draft. Preble's Meadow Jumping Mouse Science Team, Boulder, Colorado.

Riggs, L.A., J.M. Dempcy, and C. Orrego. 1997. Evaluating distinctness and evolutionary significance of Preble's meadow jumping mouse: Phylogeography of mitochondrial DNA non-coding region variation. Colorado Division of Wildlife, Denver, Colorado.

Schorr, R.A. 2001. Meadow jumping mice (*Zapus hudsonius preblei*) on the U.S. Air Force Academy, El Paso County, Colorado. USDOD Air Force Academy, Colorado.

Travsky, Amber L. 1997. F.E. Warren Air Force Base: Surveys for the Preble's Meadow Jumping Mouse (*Zapus hudsonius preblei).* Report prepared by Amber Travsky of Real West Natural Resource Consulting for the U.S. Air Force, F.E. Warren Air Force Base.

U.S. Fish and Wildlife Service. 2001a. Endangered and threatened wildlife and plants; Final special regulations for the Preble's meadow jumping mouse. Federal Register 66(99): 28125-28131.

U.S. Fish and Wildlife Service (USFWS). 2001b. Endangered and threatened wildlife and plants; Proposed special regulations for the Preble's meadow jumping mouse. Federal Register 66(169): 45829-45833.

U.S. Fish and Wildlife Service. 1999. Interim survey guidelines for Preble's meadow jumping mouse: Revised May 19, 1999.

U.S. Fish and Wildlife Service. 1998. Endangered and Threatened Wildlife and Plants: Final Rule to List the Preble's Meadow Jumping Mouse as a Threatened Species. Federal Register 63(92): 26517-26530.

Young, David P., Jr., Wallace P. Erickson, and Jeffery C. Gruver. Investigation of Management and Effects of Structure, Composition and Distribution of Riparian Vegetation on Preble's Meadow Jumping Mouse: 1999. 2000. Report prepared for U.S. Air Force, F.E. Warren Air Force Base, March 31, 2000.

Table 1. Complete list of parcels, creek names, and reasons for survey or no survey.

Parcel number	Legal description	Creek name	Surveyed? (Y/N)	Reasons for survey/exclusion	Notes	Figure number
1	T19N, R65W, S24, NENW	Curly Run Ck	Y	1. Actual stream segment surveyed was T19, R65, S24, SWNE, which is one quarter mile away and is State land.[1]		3
2	T22N, R61W, S14, SENW	Horse Ck	Y	1. Dense Russian olive overstory vegetation. 2. Dense, tall herbaceous understory vegetation.		4
3	T22N, R60W, S18, NESW	pond	N	1. Vegetation around pond dominated by cattails.		5[2]
	T22N, R60W, S18, SESE	pond	N	1. Vegetation around pond dominated by cattails.		6
	T22N, R61W, S25, NWNW	Dry Ck	Y	1. Dense, tall herbaceous vegetation.		7
	T22N, R61W, S24, NWNW	Dry Ck	N	1. Similar vegetation to T22, R61, S25, NWNW. Due to time constraints, and close proximity of stream sections, we surveyed only T22, R70, S25NWNW.	Stream crosses corner of BLM parcel.	8
	T22N, R61W, S24, NENE	pond	N	1. Vegetation dominated by cattails.		9
	T22N, R61W, S24, 25	pond complex	N	1. Vegetation dominated by cattails.		10
4	T24N, R70W, S2, N2SE	Marble Quarry Ck	N	1. Creekbed was dry and grasses were growing in it. 2. Adjacent vegetation short and sparse.		11[2]
5	T30N, R74W, S17, NWSW	LaPrele Ck	N	1. Manager refused permission to cross private land.		No pic.

6	T26N, R64W, S30, SWSE	irrigation canal	Y	1. Dense, tall herbaceous vegetation. on south side of irrigation ditch. An access road is right next to the ditch on the north side.		12^2
7	T25N, R67W, S26, SENE	Chugwater Ck	Y	1. Dense, tall herbaceous vegetation with cottonwood overstory.		13^2
8	T28N, R70W, S32, NWSW	Crow Ck	N	1. Lessee did not grant access. Left 4 messages on answering machine (6-20, 6-22, 7-2, 7-30); lessee did not return calls. 2. Appears that land could be accessed from public road on BLM 1:100,000 map, but map is incorrect. Would have to cross what is now private land.		No pic.
9	T24N, R69W, S30, SESW	Unknown	N	1. Dry streambed. Adjacent vegetation short and sparse.		14^2
	T24N, R69W, S31, SENW	Unknown	N	1. Short, sparse streamside vegetation.		15^2
	T24N, R70W, S25, SENE	Laramie River	Y	1. Dense and tall herbaceous vegetation with cottonwood overstory.	Other side of stream is private land.	16^2
	T24N, R70W, S35, SWNE		N	1. There is no water in this parcel, and no evidence of ever having water.		17^2
10	T24N, R69W, S17, SESE	Laramie River	Y	1. Dense, tall herbaceous vegetation along stream. 2. Cottonwoods set back from stream about 15 m.	Other side of stream is private land.	18^2
11	T21N, R70W, S14, E2NW	Mule Ck	N	1. Waterfall at boundary made stream inaccessible. Just below		19

				waterfall, water enters irrigation pipes.		
12	T21N, R69W, S30, SWNE	Deadhead Ck	Y	1. Tall, dense herbaceous vegetation in June. Grass grazed down to less than 8 in. tall when surveys were done in August.		20
	T21N, R69W, S19, NWNW	Deadhead Ck	Y	1. Tall, dense herbaceous vegetation present in June. Grass grazed down to about 6 in. by August when surveys were done.	Stream crosses corner of BLM parcel.	21
	T21N, R70W, S14, NESW	Mule Ck	N	1. Short, sparse vegetation alongside stream.		22[2]
	T21N, R70W, S23, SENW	Mule Ck	N	1. Dry streambed. Sagebrush adjacent to streambed. Lessee stated that this part of the stream usually dries up in Spring.		23[2]
	T21N, R70W, S26, SENW	Mule Ck	Y	1. Dense, tall herbaceous vegetation.		24[2]
13	T21N, R68W, S18, SENW	Unknown	N	1. Dry streambed; no riparian corridor. *Artemisia* growing in streambed.		25
	T21N, R68W, S18, N2SW	Unknown	N	1. Dry streambed. Vegetation growing in streambed. Vegetation along stream was short.		26
	T22N, R71W, S31, SESE	Unknown	N	1. Veg. along streambed was grazed very short.		27[2]
	T21N, R69W, S11-14	Brush Ck	N	1. Dry streambed. Herbaceous veg. and some *Artemisia* growing in streambed.		28
	T21N, R69W, S25, E2	Unknown	N	1. No evidence of streambed.		29
	T21N, R69W, S26-27	Watergap Ck	N	1. Dry streambed; no riparian corridor. Based on veg. growing in streambed, this stream may have been dry for some time.		30

14	T21N, R68W, S8, W2NW	Richeau Ck	N	1. Inaccessibility. 2. BLM said ok to not sample due to lessee concerns that 4-wheeler might start fire on winter range.		No pic.
15	T21N, R68W, S5, N2S2	Richeau Ck		1. Inaccessibility. Roads that appear on map no longer exist.		No pic.
16	T27N, R70W, S10, NESW	Dagley Ck	N	1. Segment of stream barely clipped corner of BLM land. The area was also difficult to access.		31
	T27N, R70W, S14, SWNW	Cottonwood Ck	Y	1. Dense willows along stream.		32
	T27N, R70W, S20, NWSW	Preacher Ck	N	1. No water in this streambed. 2. Veg along streambed sparse and grazed short.		33[2]
	T27N, R70W, S28, NWNE	Trib. to Fish Ck	N	1. Stream was outside BLM boundary. 2. Stream was dry but had willows and cottonwoods alongside it.		34
17	T28N, R74W, S9, SWNW	Corduroy Ck	Y	1. Dense aspen overstory. Occasional *Juniperus communis*. Herbaceous understory not dense. Mesic area.	Stream crosses corner of BLM parcel.	35

[1]See Results/Discussion for complete discussion.

[2]A roll of film containing photos of these sites was lost. Replacement pictures were taken October 3-5.

Table 2. Summary of small mammal captures on BLM parcels surveyed in 2001. Numbers in parentheses are captures per 100 trapnights.

Species	Parcel 1 T19,R65,S24,NENW	Parcel 2 T22,R61,S14, SENW	Parcel 3 T22, R61, S25, NWNW	Parcel 6 T26, R64, S30, SWSE	Parcel 7 T25, R67, S26, SENE[3]
Jumping mouse (*Zapus* spp.)	0(0)	0(0)	0(0)	0(0)	0(0)
Deer mouse (*Peromyscus maniculatus*)	22(5)	6(1)	5(1)	1(0)	12(6)
Vole (*Microtus* spp.)[1]	6(1)	0(0)	3(0)	0(0)	0(0)
Shrew (*Sorex* spp.)[1]	0(0)	0(0)	0(0)	1(0)	0(0)
Harvest mouse (*Reithrodontomys* spp.)	0(0)	0(0)	0(0)	0(0)	1(0)
Bushy-tailed woodrat (*Neotoma cinerea*)	0(0)	0(0)	0(0)	0(0)	0(0)
Total captures	28(6)	6(1)	8(1)	2(0)	13(6)
Total tripped traps[2]	42	40	66	102	59
Total known taxa	2	1	2	2	2
Total trapnights	480	428	880	600	240
Net trapnights [total - (0.5 * sprung traps)]	459	408	847	549	210

[1]Due to difficulty identifying voles and shrews in the field, these animals were identified only to genus.

[2]Total tripped traps includes animal captures as well as traps tripped for unknown reasons.

[3]The transect was between 50-100 m long, because the stream crossed only a corner of the BLM parcel.

[4]The other side of the stream was private land and was not surveyed.

Table 2. Summary of small mammal captures on BLM land in 2001. Numbers in parentheses are captures per 100 trapnights.

Species	Parcel 9 T24, R70, S25, SENE[4]	Parcel 10 T24, R69, S17, SESE[4]	Parcel 12 T21, R70, S26, SENW	Parcel 12 T21, R69, S30, SWNE	Parcel 12 T21, R69, S19, NWNW[3]
Jumping mouse (*Zapus* spp.)	0(0)	0(0)	0(0)	0(0)	0(0)
Deer mouse (*Peromyscus maniculatus*)	0(0)	1(0)	0(0)	0(0)	0(0)
Vole (*Microtus* spp.)[1]	0(0)	1(0)	11(2)	1(0)	0(0)
Shrew (*Sorex* spp.)[1]	0(0)	0(0)	0(0)	0(0)	0(0)
Harvest mouse (*Reithrodontomys* spp.)	0(0)	0(0)	0(0)	0(0)	0(0)
Bushy-tailed woodrat (*Neotoma cinerea*)	0(0)	0(0)	0(0)	0(0)	0(0)
Total captures	0(0)	2(1)	11(2)	1(0)	0(0)
Total tripped traps[2]	126	17	20	26	17
Total known taxa	0	2	1	1(0)	0
Total trapnights	282	267	480	480	488
Net trapnights [total - (0.5 * sprung traps)]	219	258	470	467	479

[a]Due to difficulty identifying voles and shrews in the field, these animals were identified only to genus.

[2]Total tripped traps includes animal captures as well as traps tripped for unknown reasons.

[3]The transect was between 50-100 m long, because the stream crossed only a corner of the BLM parcel.

[4]The other side of the stream was private land and was not surveyed.

Table 2. Summary of small mammal captures on BLM land in 2001. Numbers in parentheses are captures per 100 trapnights.

Species	Parcel 16 T27, R70, S14, SWNW	Parcel 17 T28, R74, S9, SWNW[3]	**Total**
Jumping mouse (*Zapus* spp.)	0(0)	4(2)	4(0)
Deer mouse (*Peromyscus maniculatus*)	0(0)	3(1)	50(1)
Vole (*Microtus* spp.)[1]	14(3)	1(0)	37(1)
Shrew (*Sorex* spp.)[1]	0(0)	1(0)	2(0)
Harvest mouse (*Reithrodontomys* spp.)	0(0)	0(0)	1(0)
Bushy-tailed woodrat (*Neotoma cinerea*)[3]	0(0)	1(0)	1(0)
Total captures	14(3)	10(4)	95(2)
Total tripped traps[2]	31	24	570
Total known taxa	1	5	5
Total trapnights	480	240	5345
Net trapnights [total - (0.5 * sprung traps)]	464	228	5058

[1]Due to difficulty identifying voles and shrews in the field, these animals were identified only to genus.

[2]Total tripped traps includes animal captures as well as traps tripped for unknown reasons.

[3]The transect was between 50-100 m long, because the stream crossed only a corner of the BLM parcel.

[4]The other side of the stream was private land and was not surveyed.

[5]The same woodrat was captured 3 times.

Figure 1. Distribution of jumping mice in North America (Based on data from Hall, 1981; Hafner et al., 1981; and housed at the Wyoming Natural Diversity Database)

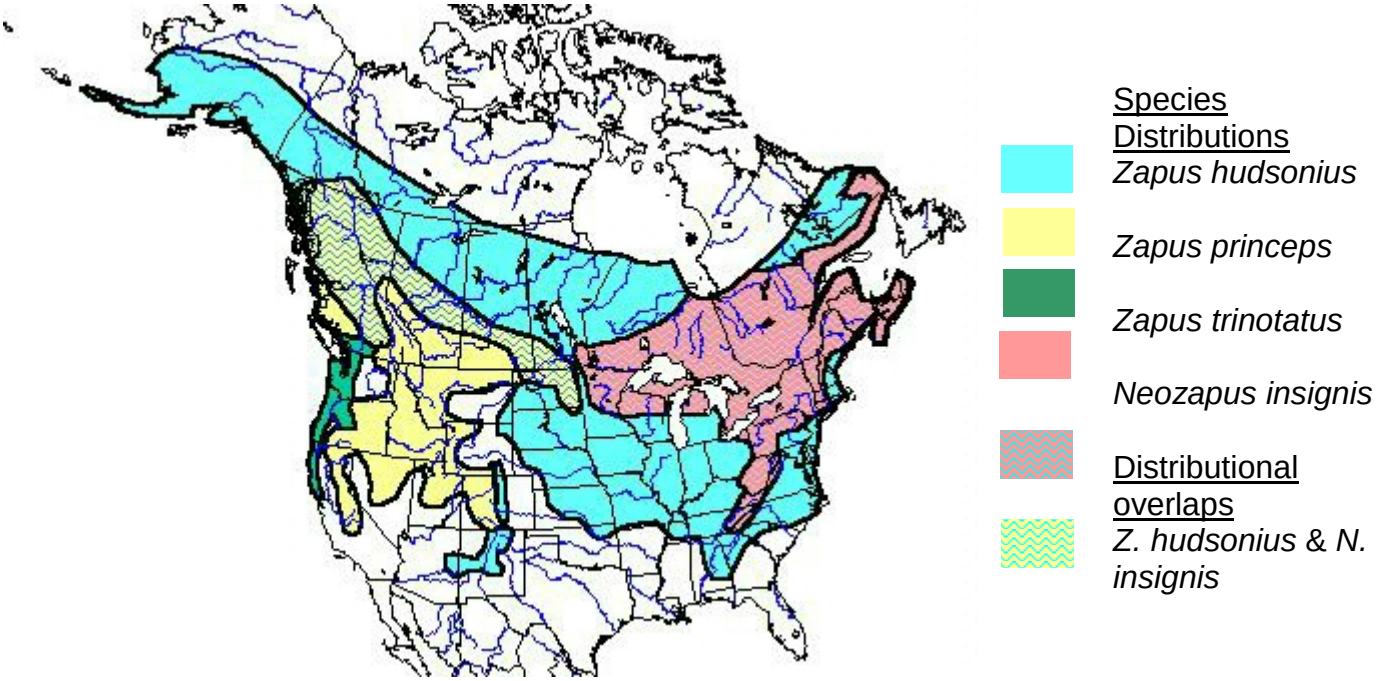

Figure 2. Distribution of jumping mice in Wyoming (Based on data from Hall, 1981; Hafner et al., 1981; and housed at the Wyoming Natural Diversity Database)