

Land Snail Survey at Custer State Park

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December 2003

Introduction

Land snails are an important part of the terrestrial ecosystem, functioning as decomposers, herbivores, prey, and potential disease vectors. Despite the importance of these organisms, surveys have been lacking in the upper intermountain west. Land snails had not been formally surveyed in Custer State Park, although they have been surveyed elsewhere in the Black Hills (extant species: Roscoe, 1954; Frest and Johannes, 2002; Anderson, 2003; fossil species: Jass *et al.*, 2002).

Methods

Snails were surveyed in June 2003. Twenty-six soil samples were taken from areas representing diverse habitats across Custer State Park (Table 1). Soil samples consisted of filling a one-gallon ziploc bag with soil and litter. These samples were sifted through a series of sieves of varying mesh sizes and live snails and shells were removed. In addition to soil samples, several areas were searched by hand for live snails. When snails were located, they were preserved in ethanol for later identification. Identification followed Pilsbry (1948) and Burch (1962). Specimens will be deposited at the University of Colorado Museum in Boulder, Colorado.

Photographs were taken of each sample location and of living snails for inclusion in a field guide to Black Hills Land Snails, which is currently being developed. The field guide will consist of photographs of each species, species descriptions, general range information, and an identification key. Hopefully the format will resemble that of the excellent Black Hills plant guide by Larson and Johnson (1999), with the addition of an identification key.

Results and Conclusions

Snails were located at 15 of the sites surveyed (Figure 1). A total of 14 species were identified from these sites (Table 2). The species list is similar to those from Wind Cave National Park (Anderson 2003) and the Black Hills National Forest (Frest and Johannes 2002), although Custer State Park did not contain all of the species found at the other locations.

Because the survey at Custer State Park was not as extensive as the surveys of other regions of the Black Hills, it is possible that additional species may be found with further surveys.

Several species identified from Custer State Park are potential secondary hosts for lungworms (*Protostrongylus spp.*) that infect bighorn sheep. Thorne *et al.* (1982) include *Vallonia*, *Pupilla*, *Gastrocopta*, *Pupoides*, *Vertigo*, and *Euconulus* genera as hosts for the lungworms. All of these genera except *Pupoides* and *Vertigo* were identified from Custer State Park. All of the aforementioned genera have been identified from elsewhere in the Black Hills (Frest and Johannes 2002, Anderson 2003). Snails were not examined for the presence of parasites, so actual infection cannot be addressed here.

Field guide preparation is progressing. A sampling of photographs to be included are shown in Figure 2. A sample description is shown in Figure 3. The photo collection now includes: close up photographs of 27 species found in the Black Hills region, more than 45 photos of a variety of habitats where snails have been found, and more than 10 photos of live snails both in their natural setting and close up indoors. Photos are still needed for several species identified by Frest and Johannes (2002), but as yet not relocated by the author.

Acknowledgements

This study was funded by the South Dakota Diversity Grant Program of 2003. Snails were collected under South Dakota Scientific Permit License #24. Thanks to Gary Brundige of Custer State Park for providing GIS coverages and other logistical assistance.

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Table 1. Snail Sample Locations (GPS locations are illustrated on Figure 1)

Site#	Location	Habitat	Sample Type	Snails Present?
1	Across hwy from Hole-in-Wall	Aspen	soil	no
2	0.3 miles N on Needles Hwy past Playhouse Rd. junction	Spruce/Aspen boulders	soil	no
3	Meadow above French Creek	Grassland	soil	no
4	Along French Creek	Birch Riparian	both	yes
5	French Creek Grassland	Grassland	soil	yes
6	South of French Creek trail	Mt. Mahagony	soil	yes
7	Walk-in Fishing Area	Riparian	both	no
8	Whiskey/Bear Gulch off 16A East	Riparian	soil	no
9	Galena Fire	Burn	soil	yes
10	N side of Coolidge Creek, south of 16A	Grassland	soil	no
11	West of Coolidge Dorm	Pine/Oak	soil	yes
12	Baker Draw	Aspen	soil	no
13	East of Hwy 87 near Flynn Creek crossing	Pine	soil	yes
14	Centennial Trailhead east of Horse Camp at 2 nd creek crossing	Riparian	hand	no
15	Cicero Fire	Burn	soil	yes
16	Badger Hole	Aspen	soil	yes
17	Lame Johnny Creek	Riparian	soil	yes
18	West and North of Wildlife Loop Road between turnoffs for Park Rd6 and 16	Grassland	soil	no
19	East Wildlife Loop Road Slope	Mt. Mahagony	soil	yes
20	Sheep Draw	Aspen	both	yes

21	Spokane Creek	Riparian	both	yes
22	Meadow NE of 16A	Grassland	soil	no
23	Harney Trail	Spruce	soil	no
24	SE side of Needles Hwy	Riparian	soil	yes
25	North Fork Bear Gulch	Oak	soil	yes
26	Little Squaw creek	Pine/Birch	hand	no
27	Mt. Coolidge Lookout	Pine/Birch Talus	soil	no

Table 2. Species identified at Custer State Park

Species (Common Name ¹)	Sites
<i>Catinella sp.</i> ²	4,15
<i>Cionella lubrica</i> (glossy pillar)	4,17,21
<i>Discus catskillensis</i> (angular disc)	20,21,24
<i>Discus whitneyi</i> (forest disc)	4,24
<i>Euconulus fulvus</i> (brown hive)	4,6,21,20
<i>Gastrocopta armifera</i> (armed snaggletooth)	6
<i>Gastrocopta holzingeri</i> (lambda snaggletooth)	6,9,15,19,21
<i>Hawaiiia minuscula</i> (minute gem)	4,16,20,21
<i>Nesovitrea binneyana</i> (blue glass)	4,11,13,17,20,21,25
<i>Nesovitrea electrina</i> (amber glass)	4
<i>Pupilla muscorum</i> (widespread column)	19
<i>Vallonia gracilicosta</i> (multirib vallonia)	6,9,17,19,21
<i>Vallonia parvula</i> (trumpet vallonia)	6,17
<i>Vitrina alaskana</i> ³	4

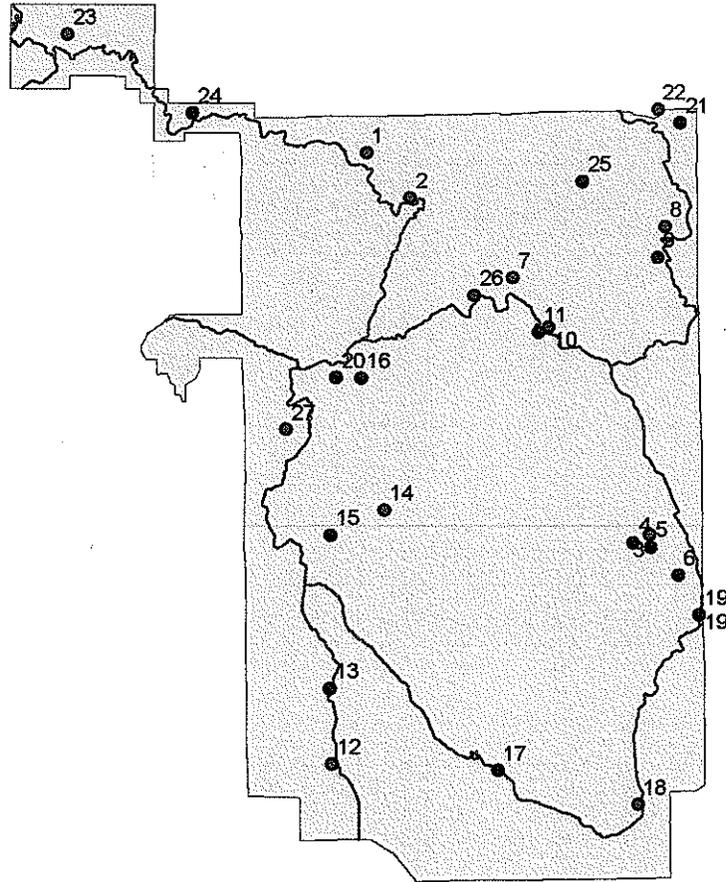
1 Common names are according to Turgeon *et al.* (1998).

2 *Catinella* are virtually impossible to identify without internal anatomy, so these are identified to genus only.

3 *Vitrina alaskana* is not listed in Turgeon *et al.* (1998). Instead Turgeon *et al.* (1998) list *Vitrina pellucida* as the "western glass-snail". However, Pilsbry (1946) considered South Dakota specimens to be *V. alaskana* and that convention is followed here.

Figure 1.

Sampling Locations in Custer State Park



Locations where samples were obtained. Sites that had snails present are shown in blue while sites without snails are recorded in red. Numbers refer to site identification numbers. Descriptions of sites are listed in Table 1.

Figure 2. Representative Photographs of Snails and Their Habitats

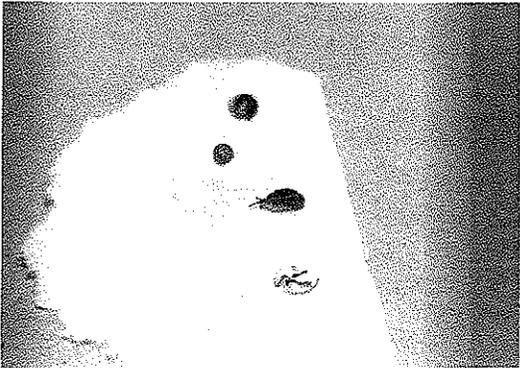
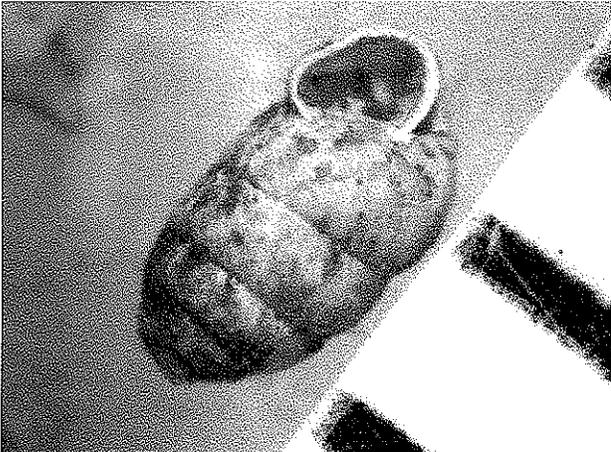
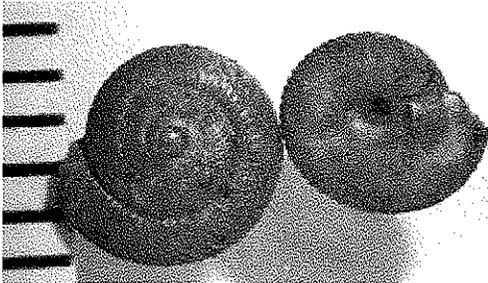
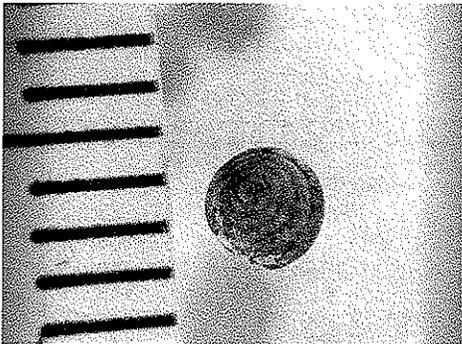


Figure 3. Example of species description to be included in field guide.

Pupilla muscorum (Linnaeus, 1758), the widespread column, has a brown shell with minute sculpturing, but no ribs. This species is 1.6 to 1.7 mm diameter and 2.8 to 4 mm tall with 5.5 to 7.5 whorls. The shell is elongate, as the other *Pupilla*, but has a distinct whitish crest behind the lip. Typically no teeth are present in the aperture, but up to three small teeth are present in some varieties. (Pilsbry 1948; Burch 1962)

Distribution: Canada and northeastern U.S. south to New Jersey in the east all the way west to Alaska and Oregon. In the central U.S., the range extends south to include Texas and Arizona. In the rest of the world, the species occurs in the northern latitudes. (Pilsbry 1948)

Habitat: Grasslands and moist leaf litter. (Hubricht 1985; Beetle 1989)