

## **Terrestrial Mollusk Surveys in Glacier National Park (GLAC-00125): 2008 Summary**

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### **Objectives**

Status of the land mollusk fauna of Montana has been largely ignored during the last 30 years. In 2003, with support of the U.S. Forest Service Northern Region, the Montana Natural Heritage Program began reviewing the status of more than 70 land snail and slug species reported for the state. This status review has been followed by nearly-annual field surveys since 2005, again with USFS support, to fill distribution gaps and sample intensively those habitats (such as mature and old-growth cedar-hemlock-grand fir forest) that appear to support the greatest diversity of species. Status review and surveys resulted in a list of 11 native land snails and 8 native slugs placed on the Montana Animal Species of Concern (SOC) List. Results of the USFS surveys were encouraging. Three native slugs and one snail were documented for the first time in Montana, and Global Ranks of five SOC species dropped from “at high risk” to a lesser status rank. The increased survey coverage also provided a foundation for the development of predictive distribution maps, which will guide future survey efforts by identifying landscapes likely to support SOC mollusks.

One of the areas lacking recent land snail surveys is Glacier National Park. No study of the terrestrial mollusk fauna has been undertaken in the park since the production of a mollusk checklist in the mid 1960's (Sterkiana 26:1-5, 1967), and only one study of the terrestrial mollusk fauna of Glacier National Park was conducted prior to the production of the 1967 checklist: a brief survey in August 1916 (Proceedings of the Academy of Natural Sciences, Philadelphia 71:195-205, 1919). MNHP surveys on Forest Service lands during 2005-2007 indicated that several SOC taxa, none of which are on the 1967 checklist, were likely to occur within the boundaries of the park, and underscored the need for additional inventory to approach completeness of the Glacier National Park checklist. In addition, significant land cover changes (wildfire in particular) have occurred in Glacier National Park since the production of the 1967 checklist, and current status of all terrestrial mollusk species in response to this change is unknown.

The work conducted in 2008 was intended as a pilot study to determine the possible presence of several SOC land snail species likely to occur in Glacier National Park, as well as to determine the continued presence of taxa appearing on the 1967 checklist. The work plan included training of Park Service personnel in survey and inventory techniques, as well as field identification of taxa encountered, so that the park could undertake additional survey work if and when resources became available. All survey sites were to be geo-referenced through use of a GPS, documented with digital imagery, added to the MNHP databases, and made available for Park Service use.

## Findings and Status

Twenty sites were surveyed for land snails during 13-18 October 2008 (Appendix 1). Elevation of sites was 3151-4100 ft, with 15 sites in or near the McDonald Creek drainage and five sites in the North Fork Flathead River drainage. Duration of surveys ranged from 30-150 person-minutes (mean = 69 person-minutes). Surveys were limited to west of the Continental Divide to avoid using valuable survey time in accessing the east side of the park (base of operations was Park Headquarters near West Glacier). Despite the lateness of the season, with early-morning frost most days, the surveys proved very productive in terms of species diversity, ranging from 0-9 species/site (mean = 4.3 species), and only one site with no land snails detected. This was due in part because sites with cottonwood and other deciduous canopy species were especially targeted.

Of the 14 terrestrial species included in the 1967 checklist, 12 of these were detected in 2008 (Table 1). Species previously reported and not detected in 2008 were Cross Vertigo (*Vertigo modesta*) and Shiny Tightcoil (*Pristiloma wascoense*). Seven new species were added to the park checklist, a 50% increase in the land snail fauna reported from Glacier National Park, and included the state SOC Reticulate Taildropper (*Prophysaon andersoni*), a G5 S1S2 slug known only from two other locations in Montana west of Noxon, Lincoln County.

Table 1. Land snails and slugs encountered west of the Continental Divide in Glacier National during October 2008. An asterisk indicates a species new to the 1967 checklist.

Common Name	Scientific Name	Total Sites	Total Individuals
<b>Snails</b>			
Suboval Ambersnail	<i>Catinella vermeta</i>	1	7
Glossy Pillar	<i>Cochlicopa lubrica</i> *	2	6
Toothless Column	<i>Columella edentula</i>	2	2
Forest Disc	<i>Discus whitneyi</i>	12	108
Brown Hive	<i>Euconulus fulvus</i>	12	44
Spruce Snail	<i>Microphysula ingersollii</i>	2	3
Blue Glass	<i>Nesovitrea binneyana</i>	6	9
Subalpine Mountainsnail	<i>Oreohelix subrudis</i>	8	61
Conical Spot	<i>Punctum randolphii</i>	5	7
Northwest Striate	<i>Striatura pugetensis</i>	2	3
Lovely Vallonia	<i>Vallonia pulchella</i> *	1	3
Western Glass-snail	<i>Vitrina pellucida</i>	7	17
Quick Gloss	<i>Zonitoides arboreus</i>	7	29
<b>Slugs</b>			
Brown-banded Arion	<i>Arion circumscriptus</i> *	5	29
Chocolate Arion	<i>Arion rufus</i> *	[1]	-
Dusky Arion	<i>Arion subfuscus</i> *	1	2
Meadow Slug	<i>Derocerus laeve</i> *	5	11
Giant Gardenslug	<i>Limax maximus</i>	1	1
Reticulate Taildropper (SOC)	<i>Prophysaon andersoni</i> *	7	27
<b>Total Species and Individuals</b>		<b>19</b>	<b>369</b>

Four of the species new to the park checklist are non-natives, one of which (Chocolate Arion, *Arion rufus*) is based on a verbal description by park personnel (sighted in the residential area of Park Headquarters at West Glacier) that could only be this large, dark to black slug. Other non-native species in the park include Lovely Vallonia (*Vallonia pulchella*), Brown-banded Arion (*Arion circumscriptus*), Dusky Arion (*Arion subfuscus*), and Giant Gardenslug (*Limax maximus*). Thus, 23.8 % of the land snail species documented in Glacier National Park to date are exotics, and 80 % of these are slugs, probably introduced originally and inadvertently in the soil of ornamental plantings and possibly animal feed.

Additional species are still likely to be found in Glacier National Park. Foremost would be the native and SOC Fir Pinwheel (*Radiodiscus abietum*) and Smoky Taildropper (*Prophysaon humile*), each of which has been documented near the park boundary on the Flathead National Forest, and perhaps a high elevation species of mountainsnail (*Oreohelix*) associated with limestone outcrops. Additional exotics are also likely to occur.

Survey results have been entered into the Montana Natural Heritage Program's Animal Point Observation Database and can be viewed at the TRACKER website at: <http://mtnhp.org/Tracker>. Copies of field dataforms, digital images of survey sites and animals, and a database spreadsheet will be provided to Glacier National Park upon the completion of this project, along with a final report. The field assistance of Steve Gniadek and Tim Goddard (Glacier National Park) is greatly appreciated, as are the efforts of Steve to see this project succeed.

Appendix 1. Survey locations for land snails in Glacier National Park, Montana, 2008. Montana Animal Species of Concern land snails are bolded.

Site Coordinates	Site Name	Elev (ft)	Date	Taxa <sup>a</sup>
N48.50050, W113.96706	“West Glacier Creek”	3250	13 Oct	Diwh (2), Eufu (2), Orsu (32), Zoar (2)
N48.50771, W113.96458	“Upper West Glacier Creek”	3720	13 Oct	Diwh (1), Eufu (10), Miin (2), Pura (1), Stpu (2)
N48.63719, W113.85593	Johns Lake	3310	14 Oct	Zoar (3)
N48.63512, W113.85655	“Johns Lake pothole”	3390	14 Oct	Pura (2)
N48.64842, W113.84022	Moose Country seeps	3300	14 Oct	Arci (9), Coed (1), Eufu (4), Orsu (1), <b>Pran (4)</b> , Stpu (1), Vipe (1)
N48.74191, W113.77263	Alder Creek	3740	14 Oct	Diwh (3), Eufu (1), Nebi (3), Orsu (4), Zoar (2)
N48.71974, W113.77158	Logan Creek toilet	3550	14 Oct	Dela (2), Diwh (7), Eufu (5), Nebi (1), Orsu (1),
N48.91677, W114.36862	Kintla Creek	3800	15 Oct	Coed (1), Diwh (4), Eufu (1), Orsu (15)
N48.85683, W114.34785	0.4 mi SE of Round Prairie	3700	15 Oct	Dela (2), Diwh (15), Eufu (3), Nebi (1), Orsu (5), Vipe (1), Zoar (14)
N48.59821, W114.03924	McGee Creek	3850	15 Oct	No mollusks found
N48.67940, W113.81650	Avalanche Creek boardwalk	3440	16 Oct	Arci (6), Diwh (2), Eufu (8), Lima (1), Miin(1), Nebi(2), Orsu (1), <b>Pran (5)</b> , Pura (1)
N48.66070, W113.79152	Avalanche Lake	3970	16 Oct	Eufu (4), Zoar (1)
N48.66889, W113.82250	Avalanche Trail	3400	16 Oct	Eufu (1), <b>Pran (2)</b> , Pura (2)
N48.60630, W113.88437	Sprague Creek Campground	3180	16 Oct	Eufu (3), <b>Pran (4)</b>
N48.50840, W114.00529	Quarter Circle Bridge	3151	17 Oct	Arci (2), Colu (1), Dela (1), Diwh (62), <b>Pran (1)</b> , Vapu (3), Vipe (3)
N48.54665, W113.98308	Fish Creek Campground	3160	17 Oct	Arci (1), Nebi (1), Orsu (2), Pura (1), Zoar (1)
N48.52616, W113.99825	“Apgar Bridge”	3160	17 Oct	Arci (11), Colu (5), Dela (5), Diwh (4), <b>Pran (6)</b> , Vipe (1)
N48.93384, W114.35709	wetland 0.5 mi W of Kintla Lake	4100	18 Oct	Cave (7), Diwh (6)
N48.82681, W114.20193	Bowman Lake Campground	4065	18 Oct	Arsu (2), Diwh (1), Nebi (1), <b>Pran (5)</b> , Vipe (4)
N48.74749, W114.24960	Lone Pine Prairie	3600	18 Oct	Dela (1), Diwh (1), Eufu (2), Vipe (3)

<sup>a</sup> Taxon codes: **Arci** (Brown-banded Arion, *Arion circumscriptus*), **Arsu** (Dusky Arion, *Arion subfuscus*), **Cave** (Suboval Ambershell, *Catinella vermeta*), **Colu** (Glossy Pillar, *Cochlicopa lubrica*), **Coed** (Toothless Column, *Columella edentula*), **Dela**

(Meadow Slug, *Derocerus laeve*), **Diwh** (Forest Disc, *Discus whitneyi*), **Eufu** (Brown Hive, *Euconulus fulvus*), **Lima** (Giant Gardenslug, *Limax maximus*), **Miin** (Spruce Snail, *Microphysula ingersollii*), **Nebi** (Blue Glass, *Nesovitria binneyana*), **Orsu** (Subalpine Mountainsnail, *Oreohelix subrudis*), **Pran** (Reticulate Taildropper, *Prophysaon andersoni*), **Pura** (Conical Spot, *Punctum randolphii*), **Stpu** (Northwest Striate, *Striatura pugetensis*), **Vapu** (Lovely Vallonia, *Vallonia pulchella*), **Vipe** (Western Glass-snail, *Vitrina pellucida*), **Zoar** (Quick Gloss, *Zonitoides arboreus*).