Australian Alps Bush Blitz

Terrestrial Gastropoda

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Frank Koehler

Nomenclature and taxonomy used in this report is consistent with:
The Australian Faunal Directory (AFD)

Contents

List of contributors

List of contributors to this report.			
Name	**Institution/affiliation**	**Qualifications/area of expertise**	**Level/form of contribution**
Frank Koehler	***Australian Museum***	***Principal Research Scientist, Malacology***	***Collecting, identifications***

Abstract

Land snails were collected at eleven sites including six remote sites that were accessed by helicopter. We collected 43 specimens representing 15 species and recorded observations of three species. Altogether, we recorded 13 native and 5 exotic species.

The diversity of land snails in the alpine areas was comparatively low when compared to land snail faunas in coastal lowlands of New South Wales. The diversity and abundance of exotic species was highest in vicinity of human settlements and infrastructure but was lower in more remote areas. Moreover, we observed reduced diversity of native snails where exotic species were present in high abundance. Overall, exotic species appear to be good indicators for existing or historical anthropogenic disturbance of natural habitats.

1. Introduction

The primary survey area was the Pilot Wilderness in the southern part of Kosciuszko National Park in NSW including immediately adjacent areas in Victoria. Some additional collections have been undertaken along accessible roads around Jindabyne.

There have been no previous land snail records from the Pilot Wilderness.

The land snail fauna at higher altitudes of the Australian Alps was not expected to be diverse, but the existence of potentially endemic species with affinities to alpine habitats was a distinct possibility. Such alpine species were expected to be rather limited in their distribution and potentially threatened by future climate change.

2. Methods

2.1 Site selection

Survey sites were selected to be on the peak of mountains to capture any alpine species and because these sites were accessible only by helicopter while no previous occurrence records existed. That meant that without access to helicopters such places would be very difficult if not impossible to visit any of these places in the future.

In addition, we selected several survey sites that were accessible by car via the few existing roads in the area to document land snail faunas at lower elevation for comparative purposes.

2.2 Survey techniques

Snails were searched by eye and hand collected. In addition, leaf litter samples were collected to capture any micro-snails, which escape the visual search due to their small size. Leaf litter was collected from sheltered places that were assessed as suitable micro-refugia for snails.

Leaf litter samples were searched under a microscope in the laboratory.

2.2.1 Methods used at standard survey sites

Standard sites have not been surveyed for land snails for the lack of time. Priority was given to surveying remote areas.

2.3 Identifying the collections

All species were identified by Frank Koehler, Principal Research Scientist, Australian Museum.

Literature used:

Stanisic, J.; Shea, M.; Potter, D.; Griffiths, O. (2010). Australian land snails. Volume 1. A field guide to eastern Australian species. Queensland Museum, Brisbane. 596 pp.

Stanisic, J.; Shea, M.; Potter, D.; Griffiths, O. (2018). Australian land snails. Volume 2. A field guide to southern, central and western species. Bioculture Press, Mauritius. 594 pp.

3. Results and Discussion

Appendix 1 lists all terrestrial gastropods recorded during the Bush Blitz. Collections made during this Bush Blitz will result in 142 specimens being added to public collections and 53 records being added to publicly accessible databases.

3.1 Un-named or not formalised taxa

None recorded.

3.2 Putative new species (new to science)

In this report, 'putative new species' means an unnamed species that, as far as can be ascertained, was identified as a new species as a direct result of this Bush Blitz.

None recorded.

3.3 Exotic and pest species

Several exotic slugs and some exotic snails are the most abundant and common gastropods throughout the National Park (and beyond). Among these species in particular the Leopard Slug is of concern. This species is particularly abundant in the vicinity of human settlements and infrastructure (road sides, clearings etc.) and such places this species and other exotic slugs have completely displaced any native species.

The abundance of exotic gastropods has been found to decrease with distance from disturbed areas and in the surveyed wilderness areas these species are either completely absent or rare. Reciprocal, native species are more diverse and more abundant in habitats that are not impacted by humans and in some distance from disturbances (including roads).

In short, where exotic species are abundant, natives are usually absent, whereas where exotic species are missing or rare, native species thrive.

Table 3. Exotic and pest species recorded

Exotic/pest species	Location sighted/observed	Indication of abundance	Comments
Limax maximus	Several sites	*Abundant*	An omnipresent and usually abundant pest
Ambigolimax spp.	Several sites	*Very abundant*	An omnipresent and usually abundant pest; possibly two cryptic

			species, *A. waterstoni* Hutchinson, Reise & Schlitt, 2022 and *A. valentianus* (A. Férussac, 1821)
Oxychilus sp.	Thredbo River Picnic Area	*Rare*	Possibly harmful to native species (carnivorous)
Zonitoides arboreus	The Pilot	*Very abundant*	
Cornu aspersum	Several sites		Common in or near anthropogenic habitats

3.4 Threatened species

None recorded.

3.5 Range extensions

No land snail records have previously been available from the Pilot Wilderness.

Table 5. Range extensions or significant infill in distribution records for species

Species	Location sighted/observed	Distance from nearest known record (km)	Comments
Scelidoropa altior	The Pilot	c. 30 km	few records on ala of this species
Paralaoma annabelli	The Pilot	c. 30 km	
Cystopelta astra	The Pilot	c. 30 km	

3.6 Genetic information

For all species samples that are suitable for genetic sampling are available (ethanol preserved).

4. Information on species lists

Some samples have not been identified to species (e.g., Elsothera sp., Meridithena sp., Ambigolimax sp.) because of difficulties to confidently assign names to samples where cryptic species exist, which can only be identified by means of dissection or detailed study of microscopic shell structure. However, none of these unidentified samples are presumed to represent undescribed species.

5. Information for land managers

The observed patterns of distribution and abundance of exotic species are indicative of the general influence of human-related disturbances, both current and historic. It appears to be critical to avoid introducing disturbances, such as introduction of materials, roads etc., in

remote areas (e.g., wildernesses areas). Such disturbances will be allowing pests species to further advance into native habitats likely to the detriment of the native fauna.

It appears impossible to control exotic gastropods once they are established.

The best way to prevent the spread of exotic gastropods is likely to minimize any new disturbance in pristine areas, such as the transformation of natural vegetation types through weed control, clearing, etc and he introduction of foreign materials (building materials, soil, plant material).

6. Other significant findings

Not applicable.

7. Conclusions

The diversity of native land snails in alpine regions is relatively low. No species was recorded that is found only at higher altitudes as species found in higher altitudes are also represented at lower altitudes.

Exotic species are highly abundant wherever habitats have been influenced by human use or occupation, including infrastructure, and where exotic species are abundant, native species are rare or absent.

Acknowledgements

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References

Stanisic, J.; Shea, M.; Potter, D.; Griffiths, O. (2010). Australian land snails. Volume 1. A field guide to eastern Australian species. Queensland Museum, Brisbane. 596 pp.

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Appendix 1. List of Gastropoda recorded during the Australian Alps Bush Blitz						
Family	**Species**	**Common name**	**Putative new species**	**Threatened (EPBC Act)**	**Threatened (State Act)**	**Exotic/ pest**
Athoracophoridae	Triboniophorus graeffei	Red Triangle Slug	No	No	No	No
Camaenidae	Austrochloritis kosciuszkoensis	Kosciuszko Bristle Snail	No	No	No	No
Charopidae	Elsothera sp.		No	No	No	No
Charopidae	Flammulops excelsior	Oblique-flamed Pinwheel Snail	No	No	No	No
Charopidae	Meredithena sp.		No	No	No	No
Cystopeltidae	Scelidoropa altior	Snowy Mountains Pinwheel Snail	No	No	No	No
Cystopeltidae	Scelidoropa sarahjaneae	Wide-ranging Pinwheel Snail	No	No	No	No
Cystopeltidae	Cystopelta astra	Snowy Mountains Humpback Snail	No	No	No	No
Gastrodontidae	Zonitoides arboreus	Orchid Snail	No	No	No	Yes
Helicidae	Cornu aspersum	Garden Snail	No	No	No	Yes
Limacidae	Limax maximus	Leopard Slug	No	No	No	Yes
Limacidae	Ambigolimax sp.	Threebanded Slug	No	No	No	Yes
Oxychilidae	Oxychilus sp.		No	No	No	Yes
Punctidae	Paralaoma annabelli	Annabell's Pinhead Snail	No	No	No	No
Punctidae	Paralaoma morti		No	No	No	No
Punctidae	Trocholaoma parvissima	Tiny Pinhead Snail	No	No	No	No
Rhytididae	Austrorhytida glaciamans	Kosciuszko Carnivorous Snail	No	No	No	No
Rhytididae	Vitellidelos helmsiana	Snowy Mountains Carnivorous Snail	No	No	No	No