Waterway revitalisation and biodiversity enhancement along Silver Creek – Wetland and Pond section, 2018

Final report - Amphibian and arboreal mammal survey and field day

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Introduction

This report provides results of surveys focussing on amphibians, but also including arboreal mammals, along Silver Creek and an adjacent wetland located near Lake Sambell Caravan Park at Beechworth Victoria in 2018. The report provides information about species which potentially occur in the area, some general discussion regarding threats to biodiversity, and recommendations for future actions.

Figure 1: (a) Wetland showing good frog habitat including reeds, fallen timber, trees, leaf litter and variable water levels (shallow and deeper water), with revegetation, (b) Silver Creek, showing some eroded edges, but also ground-storey vegetation suitable for frogs. (Photos: Alexandra Knight)

What species might occur at Beechworth?

The Atlas of Living Australia and the Victorian Biodiversity Atlas show records for 9 amphibian species within 10km of central Beechworth (Table 1).

Table 1: Amphibian species previously recorded within 10 km of Beechworth (Atlas of Living Australia and Victorian Biodiversity Atlas extracts, 13 January 2019) with details of year of most recent recording and general notes.

Common name	Species name	Last recorded	Notes
Plains' Froglet or Eastern Sign-bearing Frog	*Crinia parinsignifera*	1997	Beechworth is close to the eastern edge of its distribution – more commonly associated with woodlands and floodplains.
Common eastern Froglet	*Crinia signifera*	2011	Common and widespread in region
Eastern Banjo Frog or pobblebonk	*Limnodynastes dumerilii*	2011	Burrowing frog. Considered widespread, but may be limited by

			suitable soil conditions for burrowing. Different subspecies occurring in different regions.
Spotted Marsh Frog	*Limnodynastes tasmaniensis*	2011	Common and widespread in region
Brown Tree Frog	*Litoria ewingi*	2011	This record is from Lake Sambell Caravan Park. This may be a mistaken ID, as usually ewingi is located in more coastal areas, and paraewingi in more inland area
Victorian Tree Frog	*Litoria paraewingi*	1998	Common around Wodonga, little survey effort
Peron's Tree Frog	*Litoria peronii*	2017	Common and widespread in region
Southern Bell Frog	*Litoria raniformis*	1973	Extremely rare, severe population declines across its range since 1970s, now nationally listed as Vulnerable
Bibron's Toadlet	*Pseudophryne bibronii*	1974	Suspected to be in decline Listed as threatened under the Victorian FFG Act 1988. Surveys post 2009 fires found very few.

Figure 2: Southern Bell Frog *(Litoria raniformis)* used to be widespread in NE Vic and was previously recorded at Beechworth, but is now extremely rare and federally listed as Vulnerable. (Photo: Geoff Heard).

The list of amphibian species that can potentially be found in north-eastern Victoria includes approximately 21 species in total (www.frogs.org.au), but many of these occur in specialised habitats that are not present in the Beechworth area.

The Atlas of Living Australia has records of 36 mammal species occurring within 10km of Beechworth including several arboreal species (Table 2).

Table 2 Arboreal mammal species previously recorded within 10 km of Beechworth (Atlas of Living Australia extract, 13 January 2019) with details of year of most recent recording.

Common name	Species name	Last recorded
Feathertail glider	Acrobates pygmaeus	1973
Greater glider	Petauroides volans	1996
Sugar glider	Petaurus breviceps breviceps	2010
Squirrel glider	Petaurus norfolcensis	2005
Koala	Phascolarctos cinereus	2015
Common Ringtail Possum	Pseudocheirus peregrinus	2011
Mountain Brushtail Possum	Trichosurus cunninghami	1995
Australian Brushtail possum	Trichosurus vulpecula	2011

These extracts of records from the Atlas of Living Australia and the VBA reveal that there are very few recent public records of amphibians and arboreal mammals. In particular, lack of interest and funding for surveys means that we still have very little or even basic information about which species occur where. The lack of basic knowledge makes it difficult to ascertain if species are being affected by developments, other threats, or if they are in decline. More systematic surveys are required. It seems highly likely that local field naturalists are observing both amphibians and mammals, but are failing to make their records available publically. I would strongly encourage Landcare members to make their records available through the Victorian Biodiversity Atlas https://www.environment.vic.gov.au/biodiversity/victorian-biodiversity-atlas and the Atlas of Living Australia. These databases are used to help guide local, state and national policy and development decisions.

Methods

Three surveys were undertaken: one in late Winter, one in early Spring and one in late Spring in order to locate the variety of species active at different times of year. Surveys were undertaken just on dusk and into the evening. Amphibian surveys were undertaken by listening for calls and spotlighting along the water's edge, and only catching and releasing frogs if there was a doubt about the identification of the species or to provide information about the species to community members. Arboreal mammals were surveyed by spotlighting into the trees. The surveys were undertaken according to the conditions of CSU Animal ethics approval A18073.

Results

Only one mammal was located during the spotlights – the Common Brushtail, *Trichosurus vulpecula* with 7 individuals seen during one spotlight walk. A community member mentioned that a Koala had been sighted adjacent to the survey area in October.

Figure 3: Brushtail possums were abundant at the site (Photo: A. Knight)

Five species of amphibians were recorded (Table 3).

Table 3. Amphibian species recorded at Silver Creek wetland.

Species name	**Common name**	**Seen or heard**	**Approximate number**	**Notes**
Crinia signifera	Common eastern froglet	Both	>100	Creek and dam Winter and Spring
Limnodynastes tasmaniensis	Spotted Marsh Frog	Both	>20	Dam Spring only
Limnodynastes dumerilii	Eastern Banjo Frog	Heard	~5	Dam Late Spring only
Litoria peronii	Peron's tree frog	Both	>30	On tree trunks adjacent to dam Late Spring only
Litoria paraewingi	Victorian tree frog	Both	>30	Winter and Spring In reeds in dam Many egg masses. **Fungus on eggs**

Discussion

Globally, amphibians are the most endangered vertebrate group and in Australia approximately 50 species or 23% are considered threatened or have become extinct recently (Hero et al. 2006).

Habitat loss and modification is a major threat to amphibians and other biodiversity. Loss of vegetation, leaf litter and logs, changes in the length of time water is present and changes in water quality due to agricultural practices and urban pollution have all contributed to the reduction in numbers and diversity. Habitat loss due to agricultural activity is the "single most important human activity" causing lowland amphibian declines (Mann et al., 2009). After habitat loss, pollution is the next major factor (Mann et al., 2009). It is also possible that for many of our burrowing frogs changes in both soil structure and chemistry have affected frog diversity and abundance. Furthermore, the introduction of predators such as gambusia and carp has impacted frog populations (Kats and Ferrer, 2003; Hamer and Parris, 2013).

Waterway revitalisation and restoration projects such as this one are essential for the ongoing well-being of amphibians as well as other Australian biodiversity.

In addition to habitat loss, frogs are also susceptible to disease. Chytridiomycosis, caused by the chytrid fungus *Batrachochytrium dendrobatidis*, has caused the decline of many frog species including the iconic Southern Corroboree Frog of the nearby Snowy Mountains (Hunter, 2009). It has been assumed that this disease has only impacted upon frogs in cooler elevated areas around the world and although it is known to be present in other frog populations, no research has as yet been undertaken to quantify or investigate the effect of the disease in other regions (Blaustein and Johnson, 2010) including inland Australia. It does seem likely that the Southern Bell Frog, common in the 1970s in the region, has declined due to this disease.

The egg masses of *Litoria paraewingii* observed at this site all seemed to be covered in a fungus and most likely were unviable. There is little research into disease in amphibian eggs and tadpoles in

Australia. It would be very worthwhile to follow up on this and see if it occurs again next year, determine its nature, and investigate if it affects amphibian numbers.

Recommendations

Recommendations for the site

1. Weed control should continue. Use cut and paste techniques where possible to reduce potential overspray into aquatic habitats. Use amphibian-friendly herbicides where possible.
2. Restoration of overstorey and mid-storey. Planting in patches is recommended. Amphibians require areas where they can bask in the sun. Basking is essential for thermoregulation. Completely shaded waterways and ponds can inhibit amphibians. Leave unshaded areas where the sun can penetrate to the water and the water's edges.
3. Understorey restoration. While understorey restoration is very difficult, it adds greatly to site diversity and provides essential habitat for invertebrates and other ground-dwelling fauna. Strategically building on existing areas of native grasses and forbs is a good approach, while trying to reduce the overall introduced grassy weed burden.
4. Aquatic vegetation. The wetland shows a good mix of aquatic vegetation. Different amphibians have different niches. It's important to have both larger broader-stemmed reeds and small stem-diameter reeds. I recommend the addition of some *Eleocharis acuta* for those species reliant on small stem-diameter reeds.
5. Coarse woody debris. The dam has sufficient logs and fallen branches in it. It's important to maintain these as refugia and homes for both amphibians and mammals.
6. Consider using carton guards rather than plastic guards which may get washed downstream or become a waste hazard.

Recommendations for BULS

1. Encourage fauna and flora identification and recording activities and events to ensure there is better information about the biodiversity of Beechworth on the public record.
2. Consider a 'BioBlitz'. (I suggest you ask Sam Niedra to a meeting to talk about this).
3. Consider providing training for members and the community in fauna and flora observation and recording. A/Prof Rachel Whitsed and myself provided a trial training program for Wodonga Urban Landcare Group '*NatureMapping*' in 2018 and after positive and helpful feedback have now updated the training program. We would be happy to provide it in Beechworth.
4. Investigate the apparent fungal condition of the egg masses of *Litoria paraewingii*. Consider partnering with a researcher or university to work out what is going on and if it will have an impact on amphibian numbers at the site. Feel welcome to give me a ring regarding this.

References

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