



FrogWatch Census and 2019 Summary



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This report was written using the data collected by over 200 FrogWatch volunteers during October 2019. Many thanks to all of them.

Funding is provided by the ACT Government and Icon Water.

A special shout goes out to Will Osborne and Martin Westgate for supporting the program with scientific guidance and data analysis.

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Please refer to our online resource page to find out more about the FrogWatch program, its objectives, and the materials and methods used for data collection <https://ginninderralandcare.org.au/frogwatch/>

The Canberra Nature Map provides database support to the FrogWatch program. Find all the local FrogWatch data at: <https://frogwatch-act.naturemapr.org/>

Cover photos: CIT students training event (Photo: Liz O'Donnell), *Litoria verreauxii* - green morph (Photo: Woo O'Reilly), Frog-Parking (<https://www.reddit.com/>)

Frog species photos kindly provided by Peter Ormey and John Wombey

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FrogWatch 2019 Highlights

The ACT and Region FrogWatch Program (FrogWatch) is run by the Ginninderra Catchment Group. FrogWatch has been engaging volunteers since 2002 to monitor, restore and protect local frog habitat, and to raise awareness and educate. The program covers the ACT and its surrounding NSW region from Cooma in the South to Gundaroo in the North and from the Cotter River in the West to Captains Flat in the East.

FrogWatch and Waterwatch officially adopted a more formal partnership in June 2019. This will bring together these two highly successful citizen science programs and enable them both to better inform the management on our aquatic habitats and creatures within them.

2019 was busy - so nothing out of the ordinary! FrogWatch started off the year with a great presence at the highly successful "Snakes alive!" exhibition, which is set up annually by the ACT Herpetological Association (ACTHA) in the Australian National Botanic Gardens. Our Green and Golden Bell Frogs and a tank with tadpoles at various stages of development were amongst the stars of the well visited exhibition showcasing Australian herpetofauna (reptiles and amphibians) and raising awareness of their plight.

FrogWatch took part in a High-Tech Biodiversity Rescue planning meeting in March, organised by Dr Marta Yebra at ANU. Experts from different study areas came together to discuss options for acoustic fauna monitoring at Mulligan's Flat Nature Reserve as part of a larger project involving remote sensing habitat data. FrogWatch contributed important information about frog distribution at potential study sites and about experiences gained from developing and working with the FrogPhone (see further below). The involvement in such a project is the result of FrogWatch's successful and highly productive interactions with Canberra's universities and research organisations for a range of citizen science projects. It also shows an increasing recognition of FrogWatch's contribution to better understanding our local environment.

Frogwatch education resources sprang to life during Reconciliation week. Children aged 3-5 from both indigenous and non-indigenous backgrounds got engrossed in frog related activities during story times at various ACT libraries. A frog puppet show, games, models, hands-on activities and picture books were great ways to engage and fascinate even the youngest participant and wake their interest in the natural world around them.



Stony Creek Frog *Litoria lesuerii* seen during FrogCensus 2019
(photo: Woo O'Reilly).



A green morph of the Whistling Tree Frog *Litoria verreauxii* spotted near Corin Forest during FrogCensus 2019 (photo: Woo O'Reilly).

In June, many volunteers felt something was missing. In the previous four years (2015-2018) frog surveys had been done every week between June and October at 15 sites across the ACT as part of the FrogWatch Climate Change Project (funded by the ACT Government). The aim of this study was to closely monitor and track the onset of frog breeding activities (marked by mating calls) for each of the local species and to compare the findings with historic data on frog breeding behaviour for our region. As the data collection had been finalized in late 2018 no more weekly monitoring throughout winter was required in 2019. The office was nevertheless very busy with this project, verifying all data and preparing four years' worth of surveying for the much-awaited analysis. The publication of the findings is planned for late 2020.

The opening day for the Holder Wetlands in August was a great awareness raising event and many interested citizens attended, despite freezing temperatures. Attendees enjoyed guided walks and talks, a QnA session and even frog call imitations. The recently built wetlands are a Water Sensitive Urban Design structure that also provide many important habitat features for our local flora and fauna, including frogs. Many of its attributes, e.g. aquatic and fringe vegetation, connectivity to woodlands etc. will suit a range of frog species and FrogWatch volunteers will monitor their arrival over the coming years. In September, things started to really heat up, with preparations for the two largest annual FrogWatch events: the October FrogCensus and the Tadpole Kits for Schools Program.

Training seminars at the Jerrabomberra wetlands and in Cooma, lots of media attention and surveys kept us busy during the dark hours. Preparing 120 Tadpole Kits to go to schools across the Capital Region for all of school term 4, and coaching students (and teachers) through the amazing experience of observing the development of tadpoles into frogs while in their care, also required all hands on deck.

Last but not least: Frogwatch finished off the year with a big bang: the publication of the paper: The FrogPhone: A novel device for real-time frog call monitoring, in the international online journal Methods in Ecology and Evolution. The paper had been the result of a two-year collaborative project with scientists of the University of Canberra and University of New South Wales to develop the world's first remote acoustic survey device based on mobile phone technology. This caused a bit of media frenzy not only in Australia but around the globe and was a great way to wrap up yet another highly successful year of FrogWatch froggy-fun.

The FrogWatch program would not be possible without our passionate volunteers as well as the generous financial support from both the ACT Government and Icon Water. Many thanks to them.

FrogCensus 2019 Summary

One of the main outputs of the FrogWatch program is to facilitate community engagement through the monitoring of frog populations at local wetlands through the annual FrogCensus. The annual FrogCensus report provides an overview of the distribution of our local frog species, particularly in the urban setting, and aims to detect change over time.

For the first time in 2019, the FrogCensus was extended to cover the entire month of October. FrogWatch also reduced the amount of sites monitored from approximately 500 to around 250 in preparation for the FrogCensus. These actions combined are aimed at boosting detection of species during optimum conditions as well as improving data continuity by ensuring key sites are surveyed every year.

Four training events were run in 2019, three at the Jerrabomberra Wetlands and one in Cooma. In addition, numerous smaller training events were run for keen volunteers, such as Scout groups. An online booking sheet assisted volunteers in choosing their monitoring sites and helped spreading the volunteer effort evenly across all sites.

A total of 366 surveys were submitted for the October 2019 FrogCensus by over 200 trained FrogWatch volunteers. 186 FrogWatch sites were monitored, 161 of which are located in the ACT and the remaining 25 in neighbouring NSW. Sites were visited between one and nine times during the FrogCensus. The average number of visits per site was two. See species distribution maps for site locations and Appendix A for the site codes, names and locations. Appendix B lists all 2019 FrogCensus volunteers.

Many ponds were dry or nearly dry for most of 2019 due to record breaking average daytime temperatures and well below average rainfall. A high proportion of sites were visited only once as a total of 27 sites were dry during the FrogCensus and therefore did not provide optimal frog-breeding conditions (Figure 1).

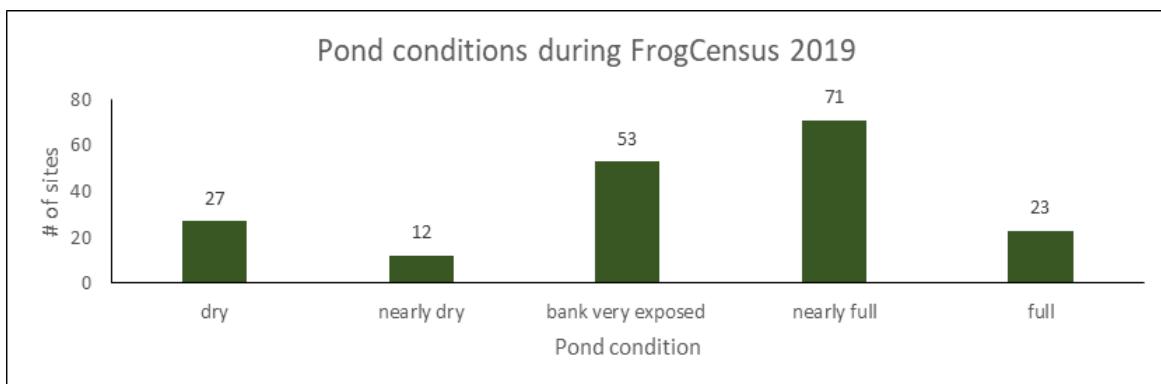


Figure 1: Pond conditions in relation to available water for breeding, October 2019.

Moreover, 66 additional survey sites provided highly unsuitable breeding habitat by being either nearly dry ($n=12$) or having very exposed banks ($n=54$). Only 50% of all surveyed sites were either full or nearly full and therefore provided good breeding conditions in relation to available water for mating and tadpole development.

Subsequently, 92 out of the 366 surveys (25%) did not detect any frogs at all. In comparison, in 2017, a year of higher rainfall, only 31 surveys out of 274 surveys (11%) showed this result.

Site Diversity

A high diversity of frog species at a survey site can indicate the presence of a wide range of frog-habitat features. Identifying these high-value sites and their species-specific habitat provision is important to inform planning and management decisions regarding areas for frog conservation.

The total number of species detected at each survey site is shown in Graph 2. Appendix C lists the scientific and common names of each species of frog found in the FrogCensus. At 42 sites, no frogs were detected at all. As a result, the average number of species detected at the 189 survey sites was 2.25. However, when excluding the 'no-frog sites' from the analysis, the average number of frog species per site increases to 2.9. The two most species rich sites, with seven species each, were CFR200: a private farm dam in the Captains Flat area, and FOR001: Forde Wetland, Gungahlin.

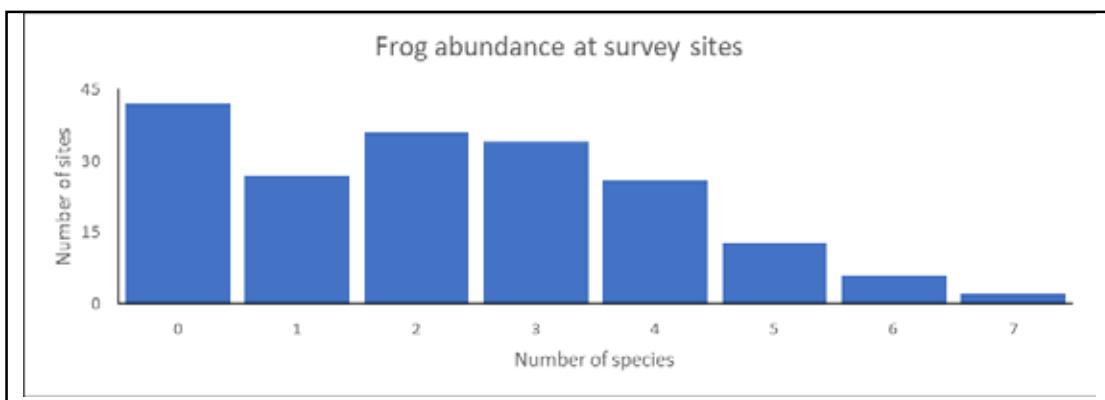


Figure 2: Frog abundance (number of species) across all survey sites (n=186) during the 2019.



CIT students at FrogWatch training event (photo: Liz O'Donnell)

Species Detected

As some sites were monitored more than others, there is a risk that some species are over-represented in the results. Because of this, the detection of each species is presented per individual site rather per survey (Figure 3). A total of nine species were detected during the 2019 FrogCensus. As in previous years, the three most frequently detected species were *Crinia signifera*, *Crinia parinsignifera* and *Limnodynastes tasmaniensis*. The species detected least was *Litoria lesueuri*, which was only found during two surveys.

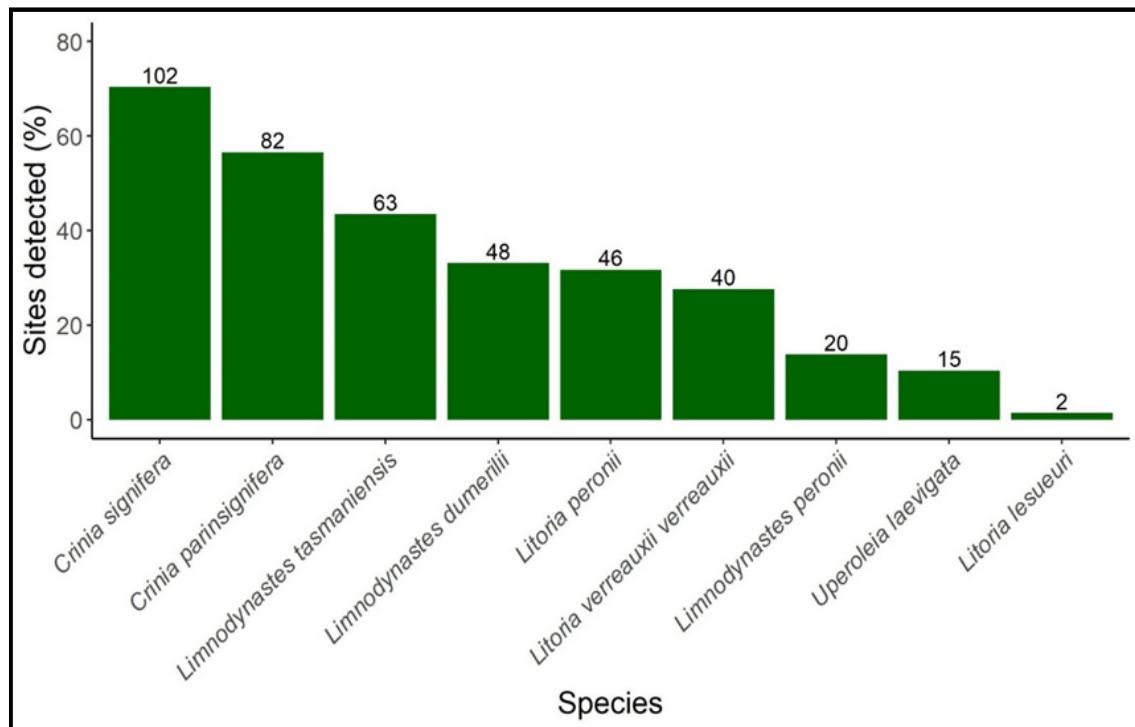


Figure 3: Percentage of sites where species were detected (actual number of sites written above).

Due to the hot and dry conditions, frog numbers were generally low in the 2019 FrogCensus. One of the main observations was the strong negative impact of the dry weather conditions on frog habitat quality. Exposed pond edges, lack of riparian and in-stream vegetation, and the absence of shade trees minimised habitat quality and most likely reduced breeding and survival rates of local frog fauna.



Whistling Tree Frog *Litoria verreauxii* spotted near Corin Forest during FrogCensus 2019 (photo: Woo O'Reilly).



Redbox Images 2017

The Emerald-spotted Tree Frog *Litoria peronii*.



Four species of frog were detected at Banksia St Wetland in O'Connor (BSW001) in the October FrogCensus.

Individual Species results

The following pages will show the findings of the 2019 FrogCensus on a species level. The habitat preference of each species is briefly described¹ and a map shows its distribution. Please note- each map shows all surveyed FrogWatch sites, but sites where a species was detected are shown in colour.

Plains Froglet - *Crinia parinsignifera*



- Highly variable
- Colour ranges from light to dark
- Back can be smooth and unpatterned to strongly marked and raised in longitudinal stripes and bumps
- Length = 25-30mm
- Call = A slight drawn out “wwrreeeeekk”, repeated regularly

The Plains Froglet *Crinia parinsignifera* is often associated with logs and rocks and can be observed sheltering in large numbers in such habitat. This species is a generalist, highly adaptable to disturbed and altered landscapes and has a broad range of breeding habitats.

In our region this species is widespread but can only be found below 800m altitude. In this species, as well as in *Crinia parinsignifera* large numbers of individuals can often be found hiding under the same log or rock to escape the heat of the day and dry conditions.

During the October 2019 FrogCensus *Crinia parinsignifera* was recorded during 135 surveys and at 83 sites.

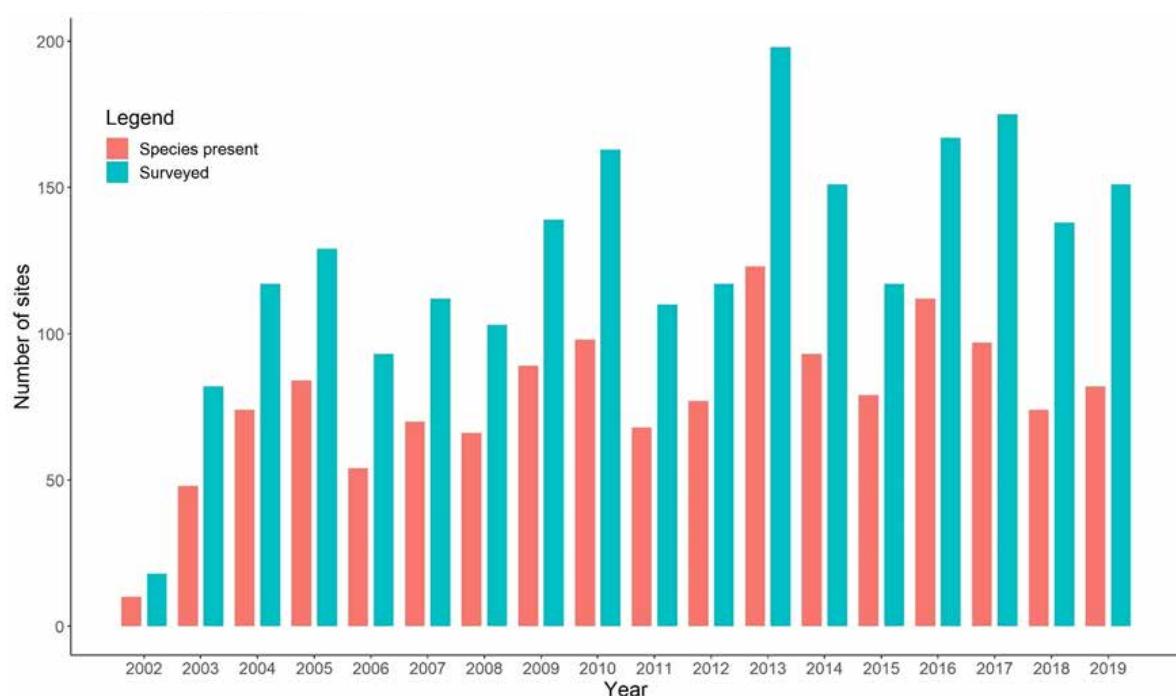
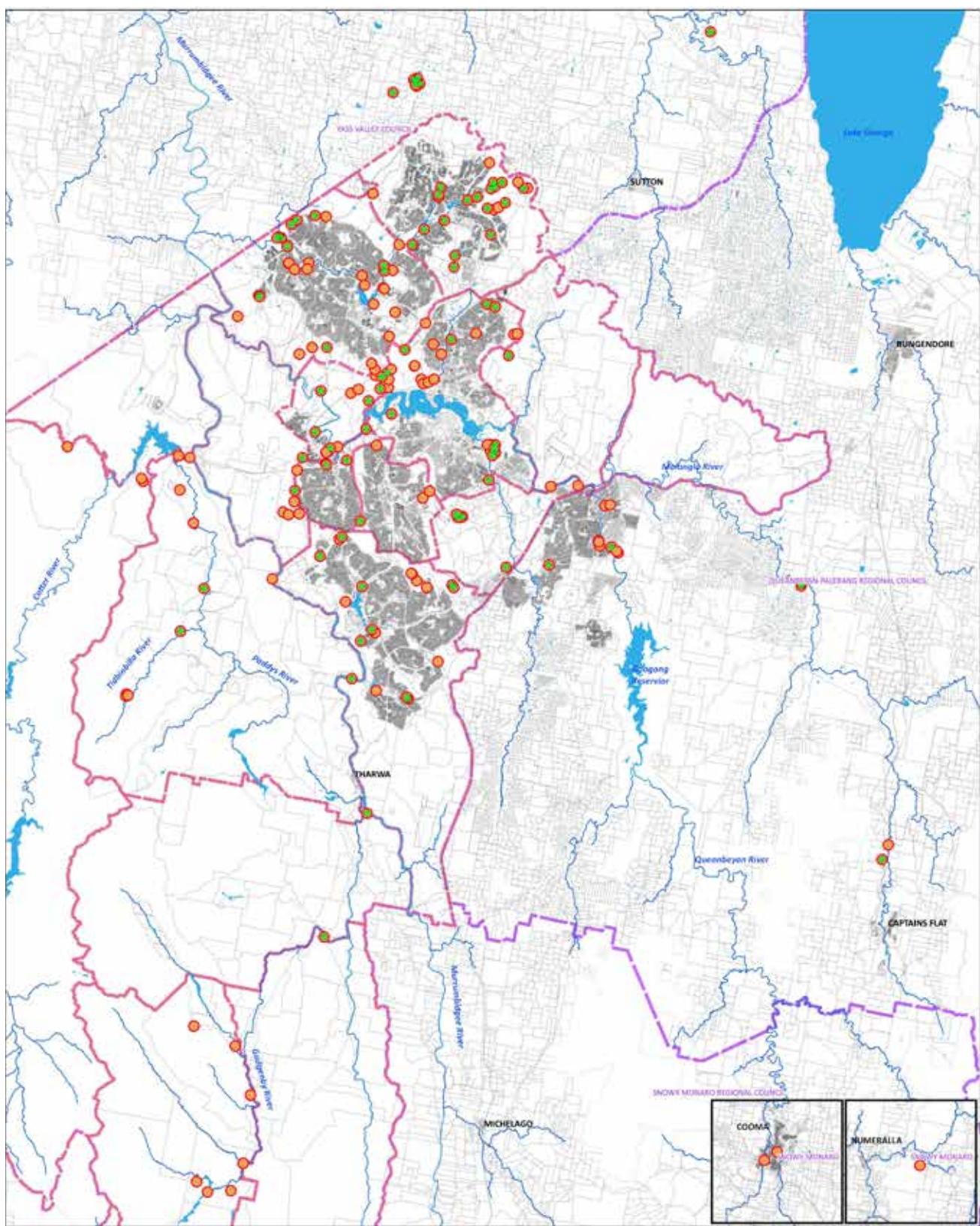


Figure 4: Number of *Crinia parinsignifera* detected vs total number of sites surveyed throughout October

¹ Species information obtained from Hoefer, A. M., and D. Starrs (2016) One pond fits all? Frogs as an indicator of urban wetland health. Final Report to Upper Murrumbidgee Waterwatch. Ginninderra Catchment Group, Canberra (http://www.act.waterwatch.org.au/Files/frogs/Hoefer_Starrings_Wetland_Indicator_Final_Report.pdf).

Species information for *Litoria lesueuri* obtained from Lintermans, M., and W. Osborne (2002) Wet and wild: a field guide to the freshwater animals of the Southern Tablelands and High Country of the ACT and NSW.



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Waterbody
- Watercourse
- Block / Lot Boundaries
- ACT Districts
- NSW LGAs

5 0 5 10 15 20 km

Datum: GDA1994

Notes:

A total of 189 sites were surveyed during the 2019 Frogwatch census. All sites are displayed as 'All Frogwatch Sites 2019'. The distribution of the target species displayed in this map is then shown as an overlay as 'Species Recorded'.

Due to their distance from the majority of sites, the Cooma and Numeralla sites are shown as insets.

Last Updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Plains Froglet

Crinia parinsignifera



All layers sourced from ACT Government's NaturaMap, NSW Government's Open Data Portal, and WRIB Environmental Site Maps

Common Eastern Froglet - *Crinia signifera*



- Highly variable colouration from grey-brown to reddish
- Can be smooth or covered in ridges
- Underside granular with black and white blotches
- Length: 25-30mm
- Call: high pitched crick..crick..crick..crick

Similar to *Crinia parinsignifera*, the Common Eastern Froglet *Crinia signifera* is a generalist species preferring open and disturbed areas. It also likes inhabited natural and constructed water bodies and has a preference for larger ponds with shallow edges.

This species is – true to its name- very common and wide spread. It is one of few species in our region that can be heard calling throughout the day, and it is - with the exception of *Litoria verreauxii* - the only local species starting to call in winter.

In the October 2019 FrogCensus, *Crinia signifera* was recorded during 158 surveys and at 82 sites.

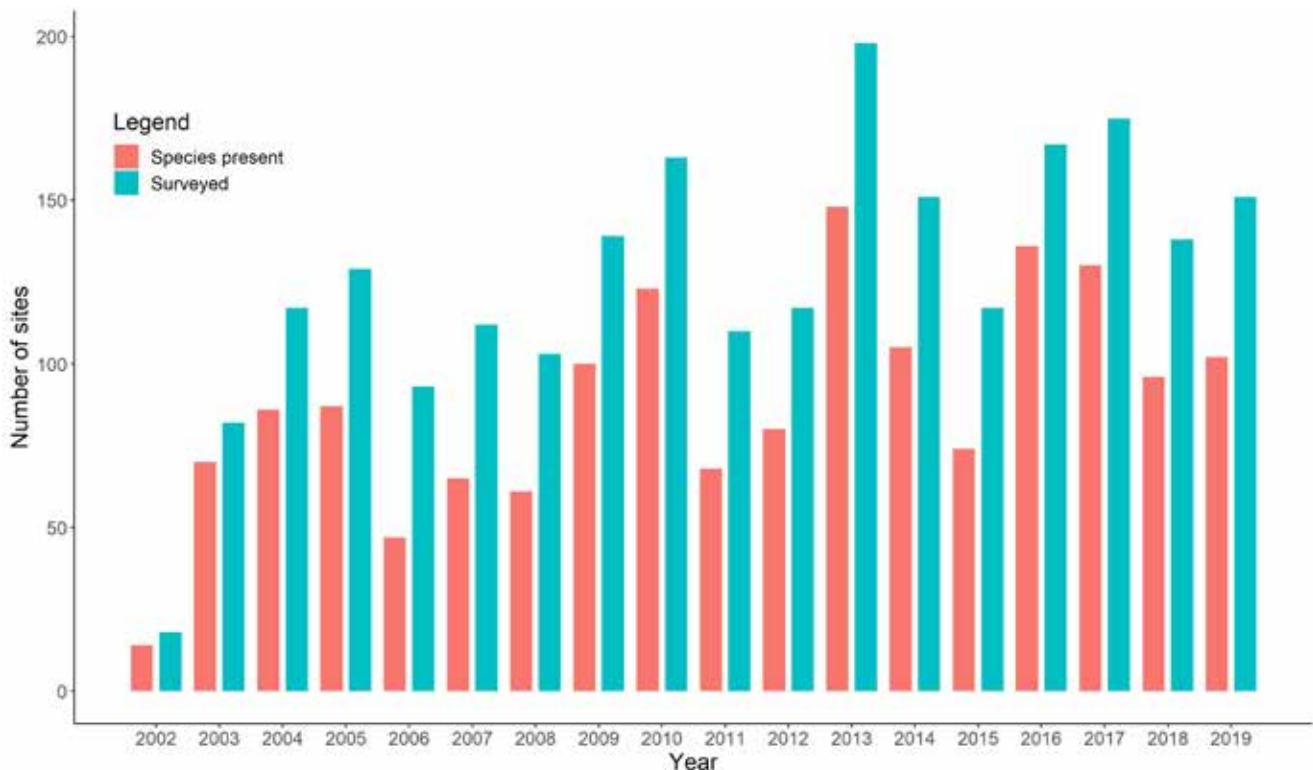
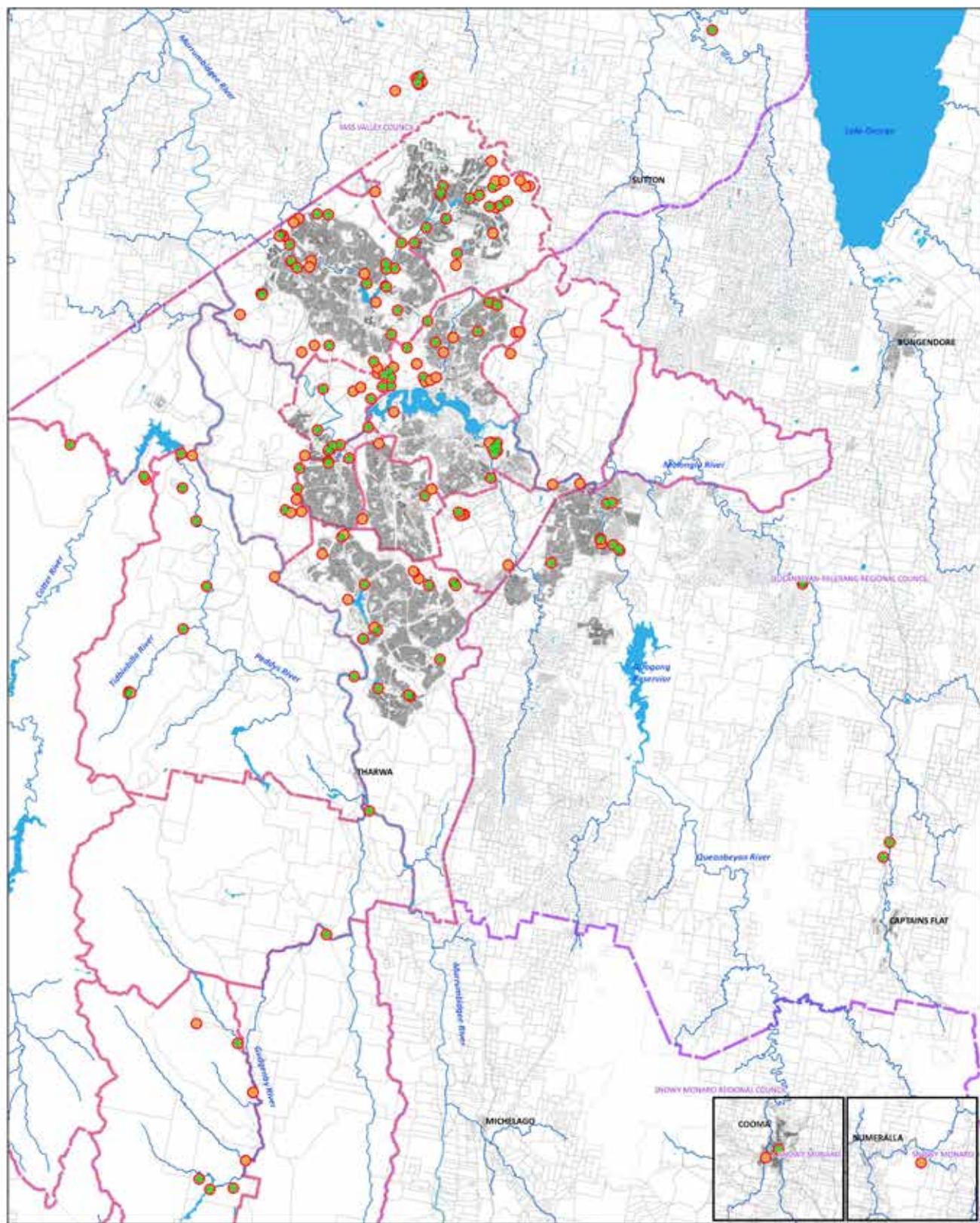


Figure 5: Number of *Crinia signifera* detected vs total number of sites surveyed throughout October



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Block / Lot Boundaries
- ACT Districts
- Waterbody
- Watercourse

5 0 5 10 15 20 km

Datum: GDA1994

Notes:

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Last Updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Common Eastern Froglet

Crinia signifera



All layers sourced from ACT Government's ACTmaps, NSW Government's Open Data Portal, and NSW Government's NSWmap.

Eastern Banjo Frog or Pobblebonk - *Limnodynastes dumerilii*



- Grey-brown in colour with a large glandular stripe running from the top of the shoulder to the mouth
- Blotched markings on sides of body
- Length = up to 85mm
- Call = repeated “bonk” or “thunk” from the water

The Eastern Banjo Frog/Pobblebonk *Limnodynastes dumerilii* prefers ponds with lots of structural complexity in the form of rocks and logs and close to patches of forest $\geq 10\text{Ha}$. The greater the distance from a reserve, the lower the likelihood of detecting this species. In the ACT region, this species is wide spread below 1200m.

In the October 2019 FrogCensus, *Limnodynastes dumerilii* was recorded during 77 surveys and at 48 sites.

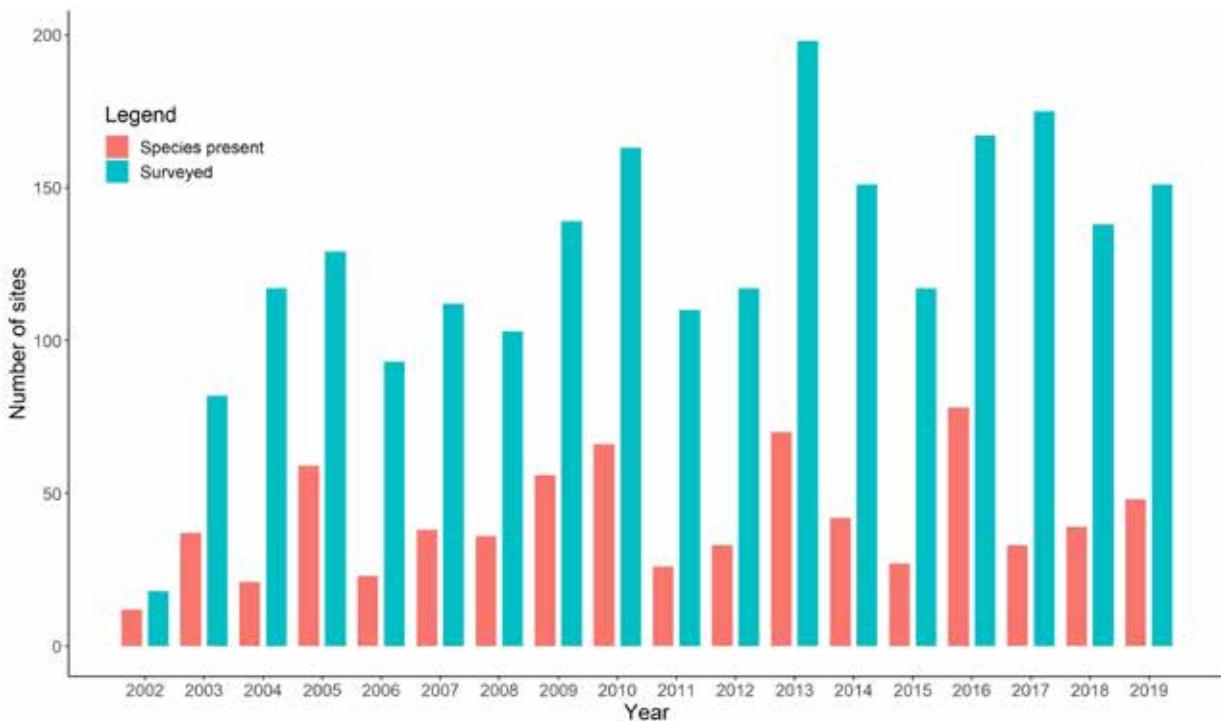
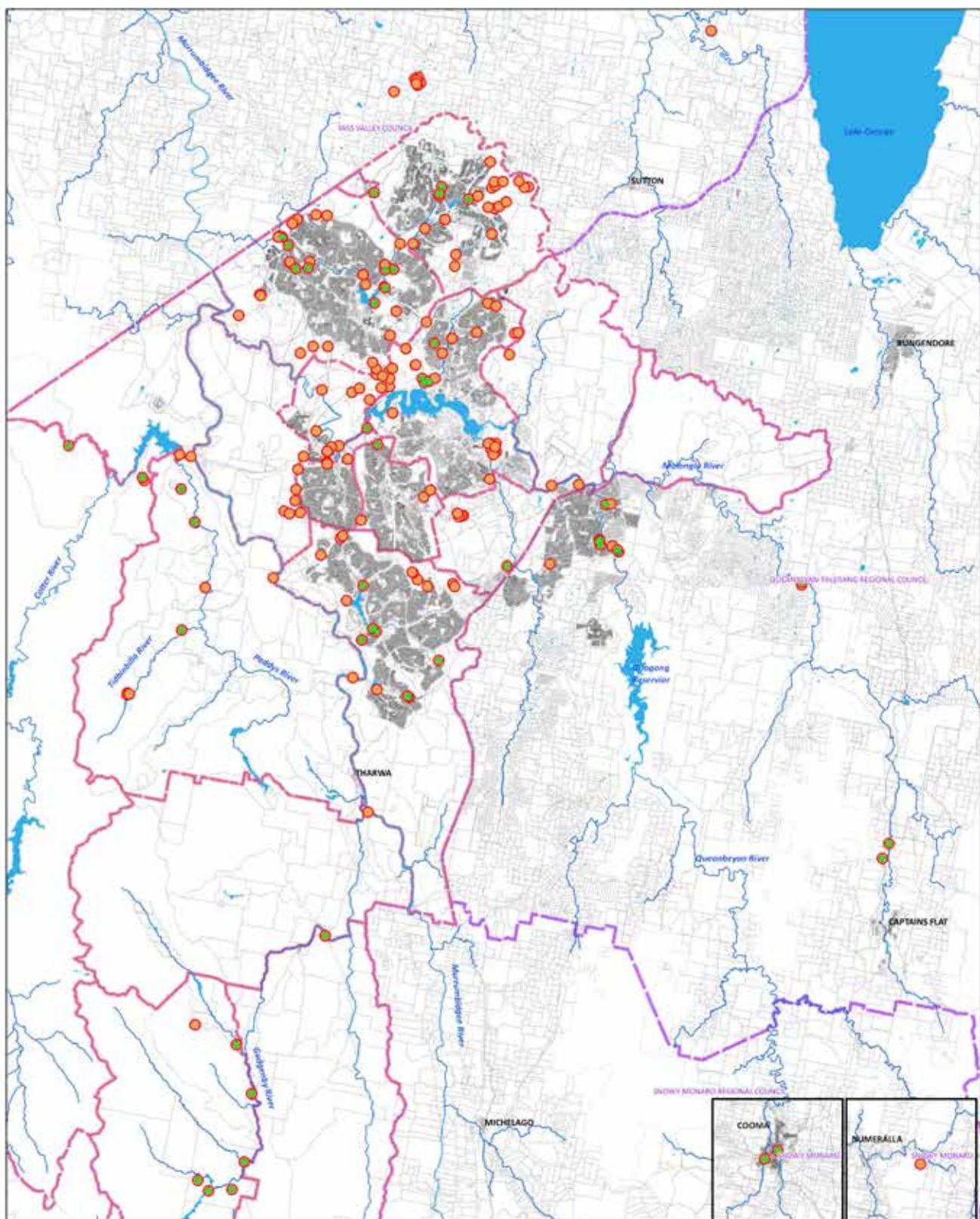


Figure 6: Number of *Limnodynastes dumerilii* detected vs total number of sites surveyed throughout October



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Waterbody
- Watercourse
- Block / Lot Boundaries
- ACT Districts
- NSW LGAs

5 0 5 10 15 20 km

Datum: GDA1994

Notes:

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Due to their distance from the majority of sites, the Cooma and Numeralla sites are shown as insets.

Last updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Eastern Banjo Frog

Limnodynastes dumerili



All layers derived from ACT Government's ACTmap, NSW Government's Open Data Portal, and NSW Government 10k tiles.

Striped Marsh Frog - *Limnodynastes peronii*



- Distinctive light and dark brown stripes on the dorsal surface
- Slightly raised glandular stripe along the mouth and behind the eye
- Length = 70mm
- Call = single “tock” repeated

The Striped Marsh Frog *Limnodynastes peronii* prefer well vegetated ponds. The presence of reeds is especially important for this frog especially when helping it seek refuge when inhabiting the same waterways Eastern gambusia *Gambusia holbrooki*, an introduced predatory fish. This species is less common in our region and often occurs in localized populations, most often in the northern ACT.

During the October 2019 FrogCensus *Limnodynastes peronii* was recorded during 27 surveys and at 19 sites.

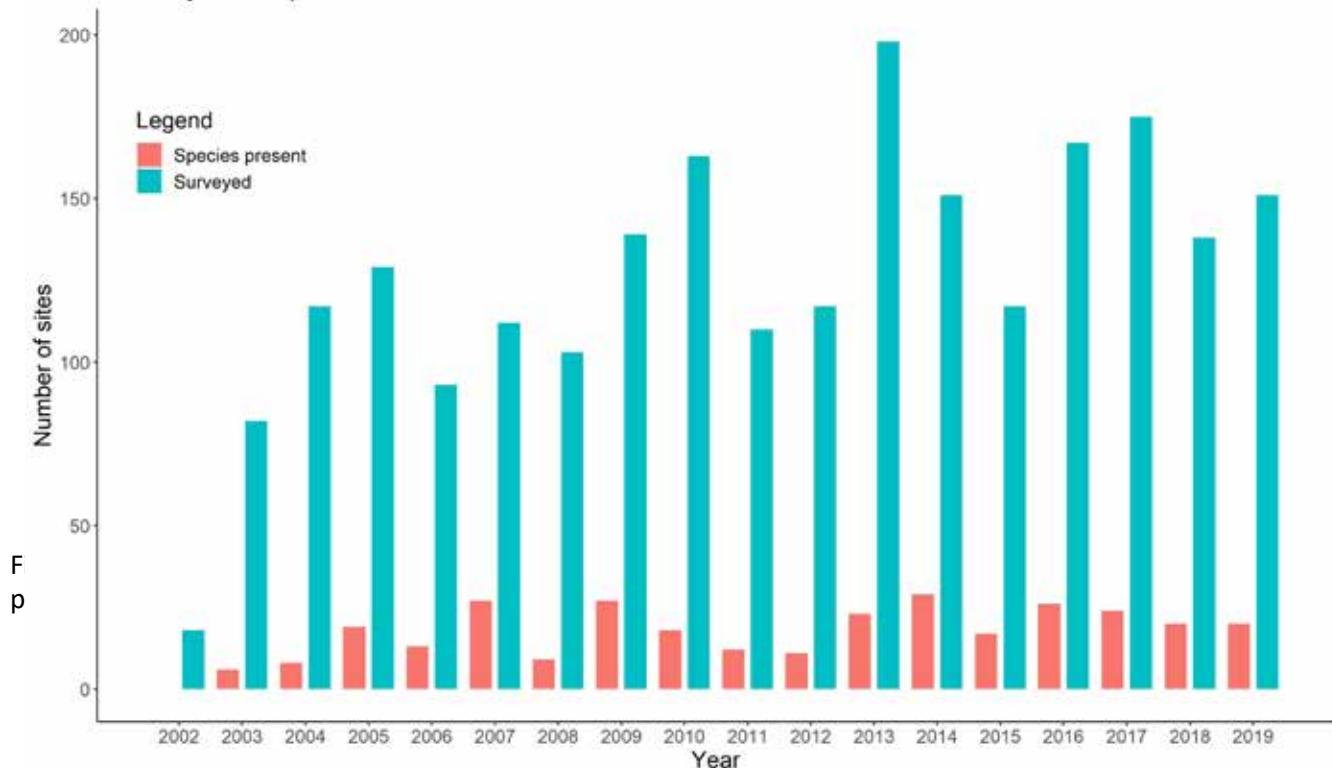
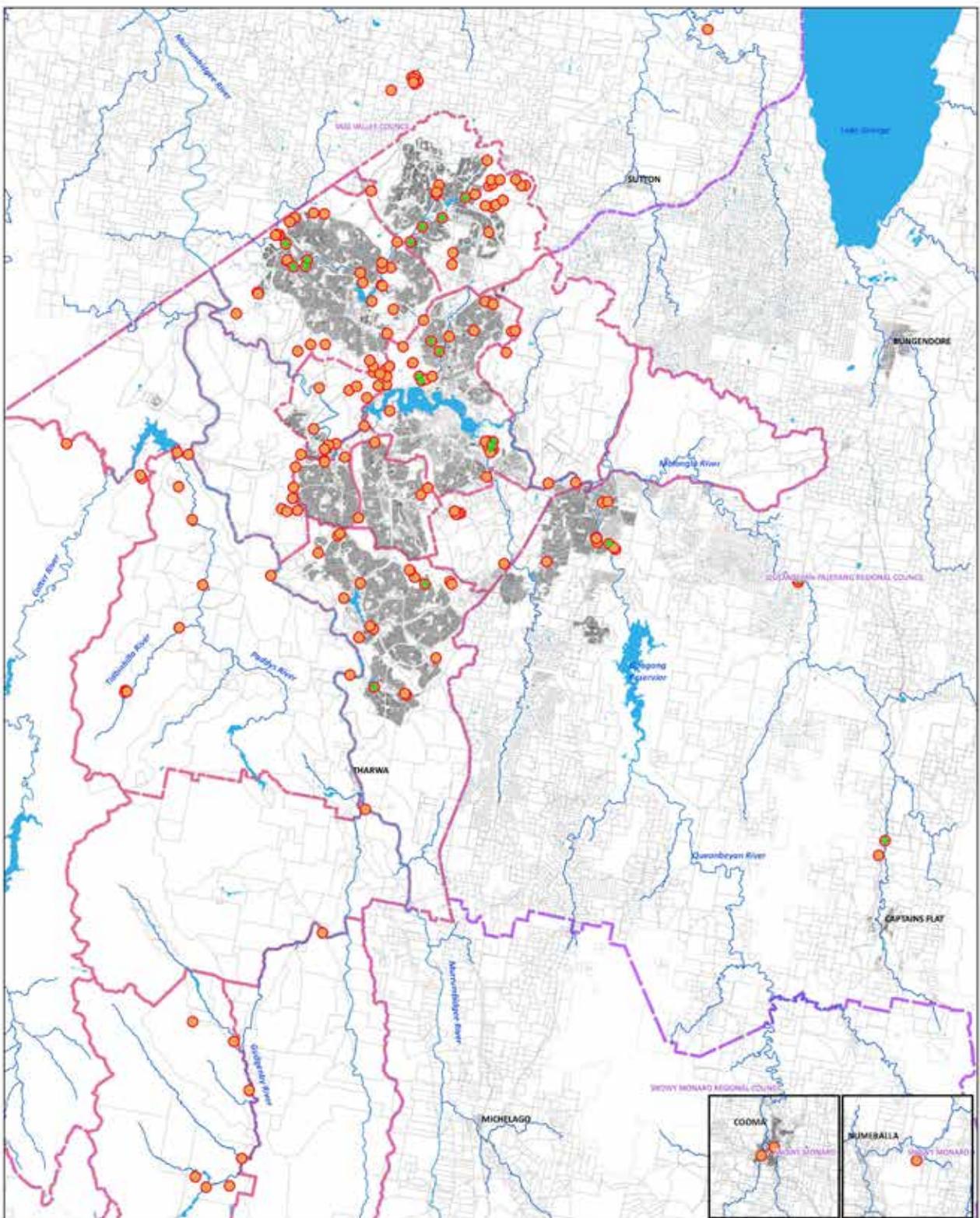


Figure 7: Number of *Limnodynastes peronii* detected vs total number of sites surveyed throughout October.



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Waterbody
- Watercourse
- Block / Lot Boundaries
- ACT Districts
- NSW LGAs

5 0 5 10 15 20 km

Datum: GDA1994

Notes:

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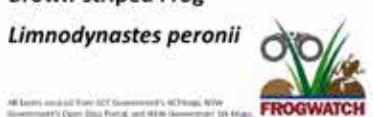
Due to their distance from the majority of sites, the Cooma and Numeralla sites are shown as insets.

Last Updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Brown-striped Frog

Limnodynastes peronii



Spotted Grass Frog - *Limnodynastes tasmaniensis*



- Blotched appearance with dark & light markings
- often with red or orange stripe along spine
- Length = up to 50mm
- Call = “uck, uck, uck”

The Spotted Grass Frog, *Limnodynastes tasmaniensis* is a generalist with very little habitat preferences. This species needs emergent vegetation to attach their egg masses to and has shown a strong preference for fish-free ponds. This species is wide spread below 900 m in our region, and one of the most commonly encountered frogs. Due to its call it is often referred to as ‘machine gun frog’. Like all members of the Genus *Limnodynastes*, females of this species produce foamy egg masses, often attached to floating or emerging aquatic vegetation.

During the October 2019 FrogCensus *Limnodynastes tasmaniensis* was recorded during 106 surveys and at 63 sites.

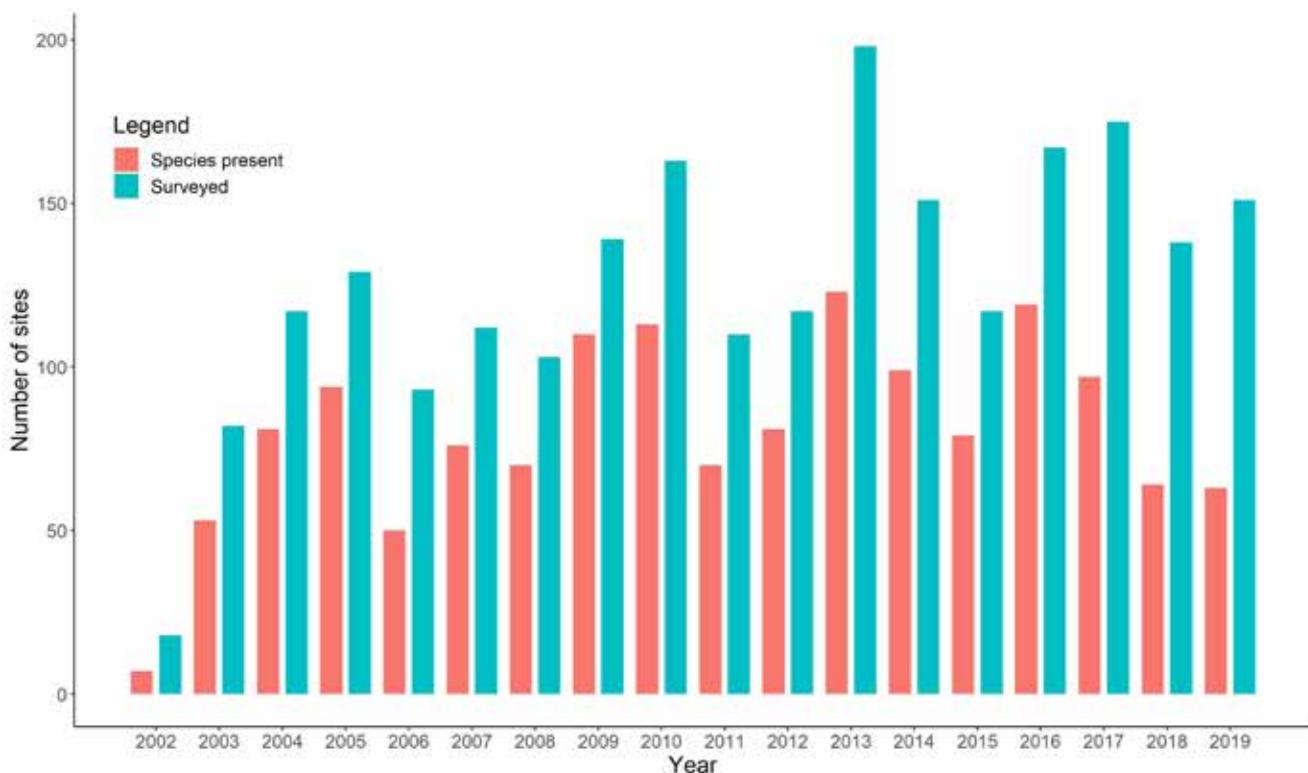
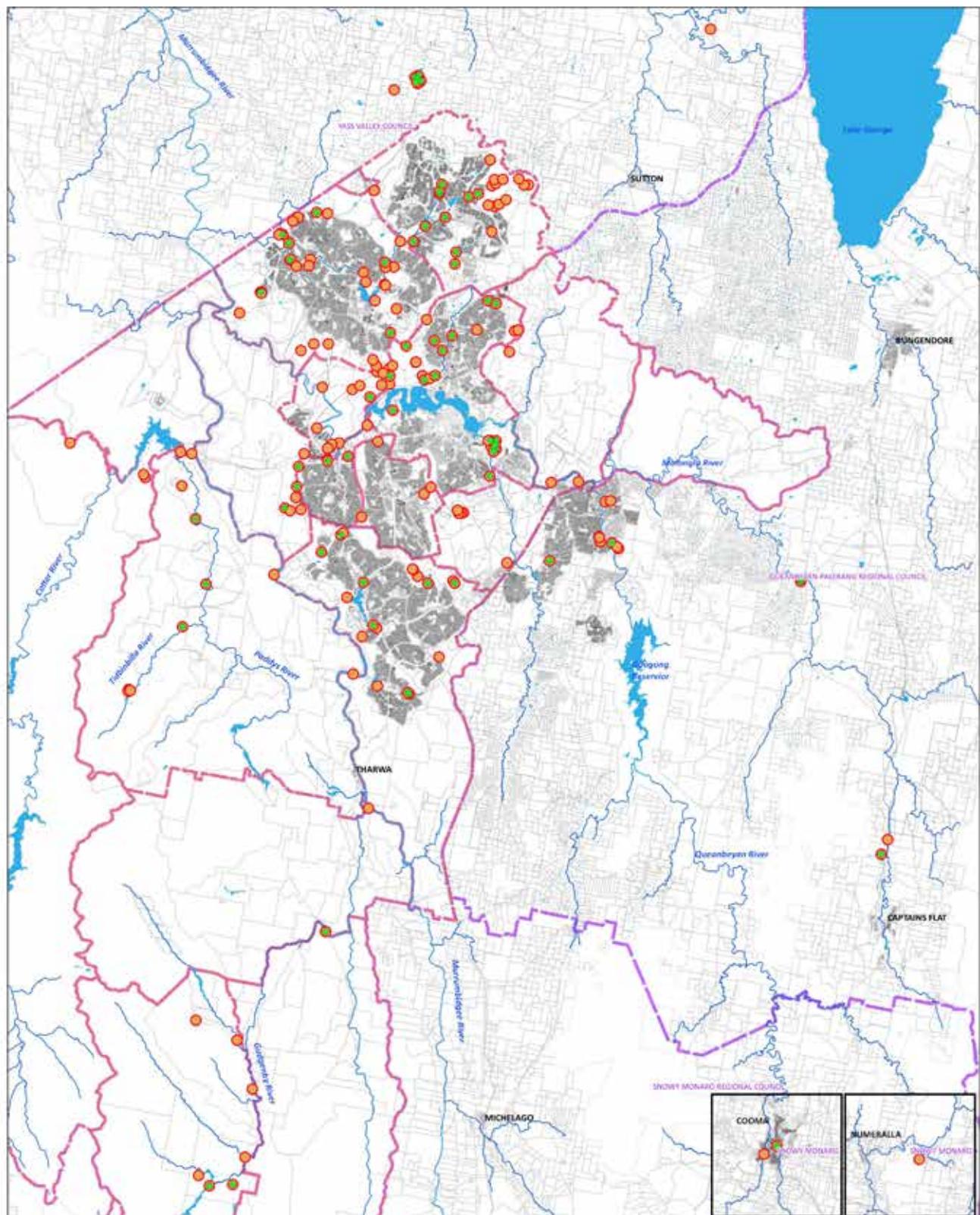


Figure 8: Number of *Limnodynastes tasmaniensis* detected vs total number of sites surveyed throughout October.



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Waterbody
- Watercourse
- Block / Lot Boundaries
- ACT Districts
- NSW LGAs

5 0 5 10 15 20 km
← ↑
Datum: GDA1994

Notes:

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Last Updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Spotted Grass Frog

Limnodynastes tasmaniensis



Stony Creek Frog - *Litoria lesueurii*



- Grey or brown in colour
- Black stripe from nostril, through the eye, to the shoulder
- Groin and hind sides of thighs mottled in black and yellow or grey-blue
- Males turn bright yellow during the breeding season
- Length = up to 65mm
- Call = series of repeated “craww”, “craww”, “craww”

The Stony Creek Frog *Litoria lesueurii* is a stream-dependent species that breeds in permanent rivers, particularly where there is ample rocky habitat. It can occupy streams flowing through cleared pastures, grasslands, woodlands and forests. In the ACT *Litoria lesueurii* is strongly associated with Murrumbidgee and Cotter Rivers.

In the October 2019 FrogCensus *Litoria lesueurii* was recorded during two surveys and at two sites.

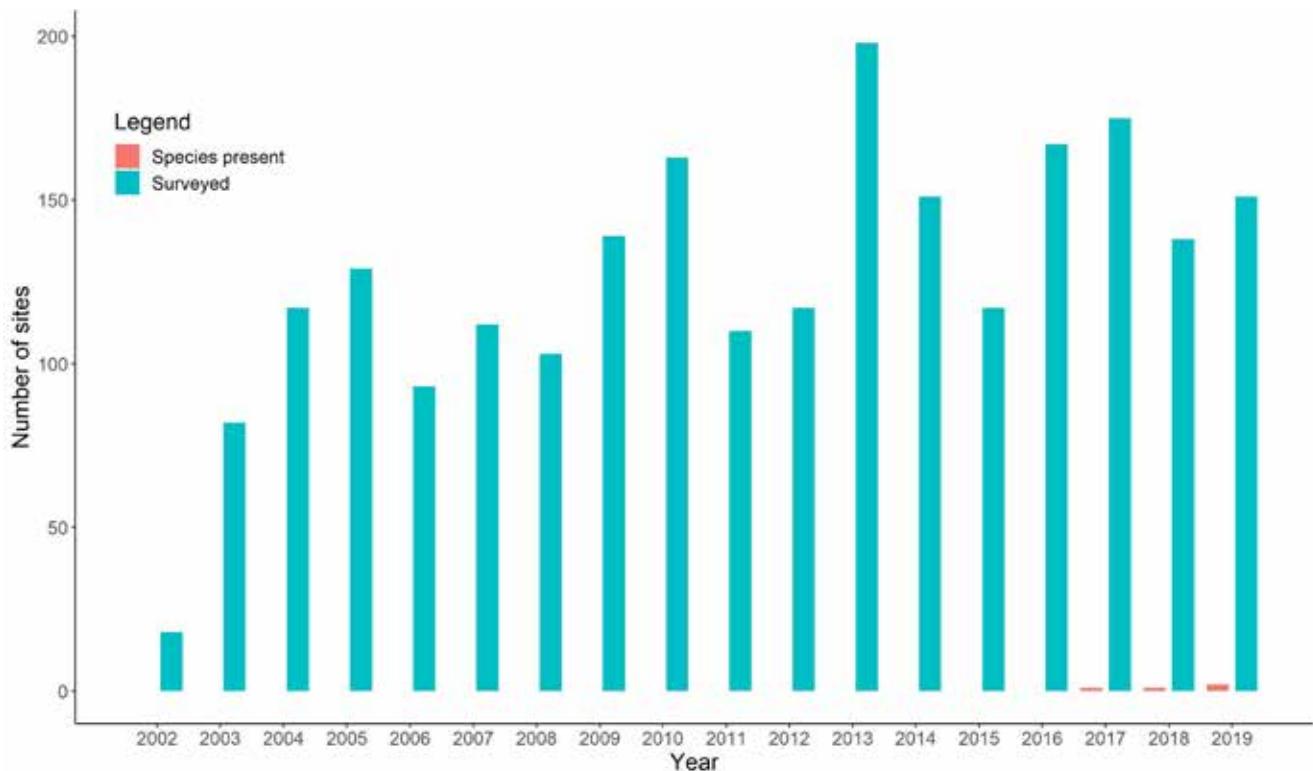
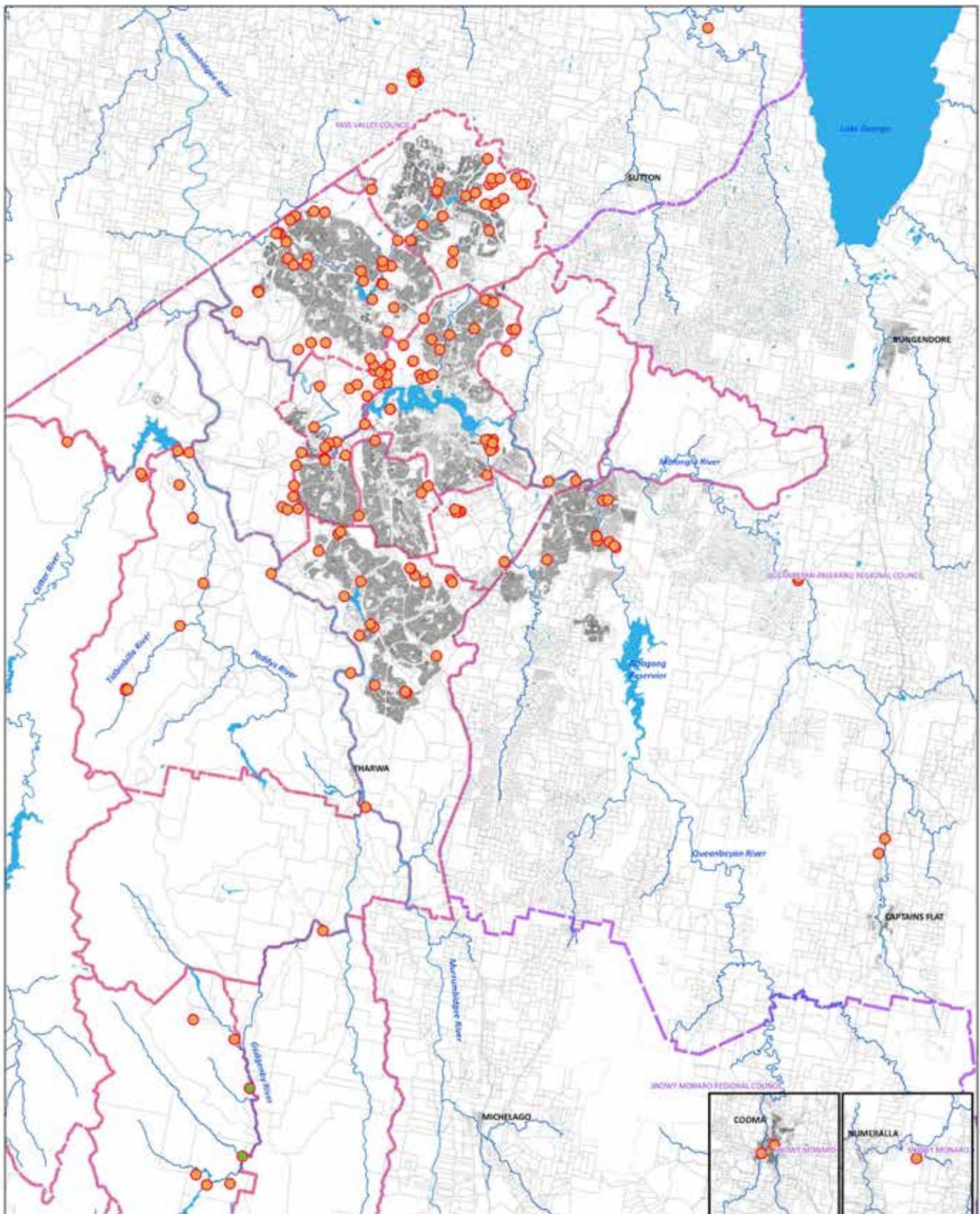


Figure 9: Number of *Litoria lesueurii* detected vs total number of sites surveyed throughout October.



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Waterbody
- Watercourse
- Block / Lot Boundaries
- ACT Districts
- NSW LGAs

5 0 5 10 15 20 km

Notes:

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2019 Frogwatch Survey Results - Species Distribution

Lesueur's Tree-frog

Litoria lesueuri



All layers sourced from ACT Government's AllMaps AROW (Government's Open Data Portal), and NSW Government's AllMaps

Emerald-spotted Tree Frog - *Litoria peronii*



- Broad round toe discs
- Yellow and black mottling behind the back leg
- Tiny emerald flecks on the dorsal surface
- + shaped pupils
- Length = 50mm
- Call = loud, descending rattle or cackle

The occurrence of the Emerald-spotted Tree Frog *Litoria peronii* is strongly associated with good riparian zone conditions. This includes the presence of fallen logs, reeds and sedges, as well as the absence of mowing. This species is a true climber and well known for hiding in water tanks or toilet cisterns.

The October 2019 FrogCensus *Litoria peronii* was recorded during 80 surveys and at 45 sites.

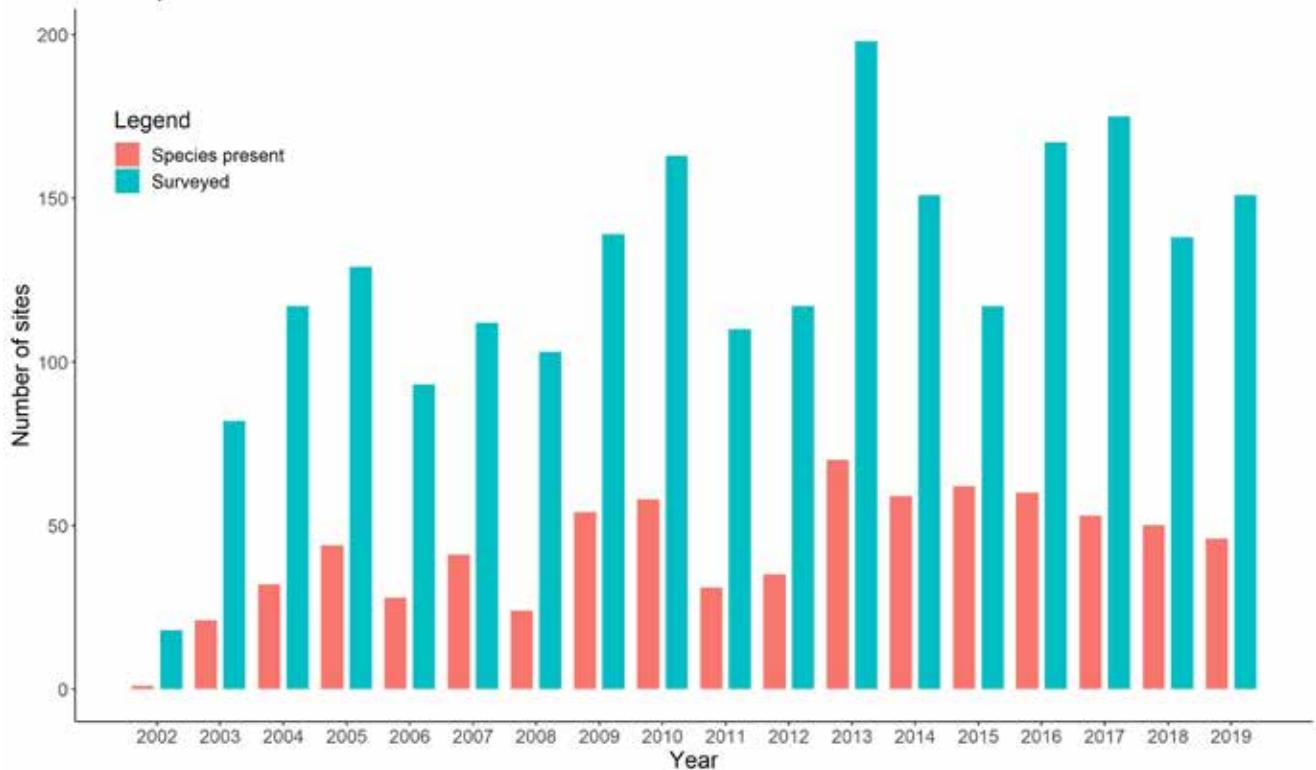
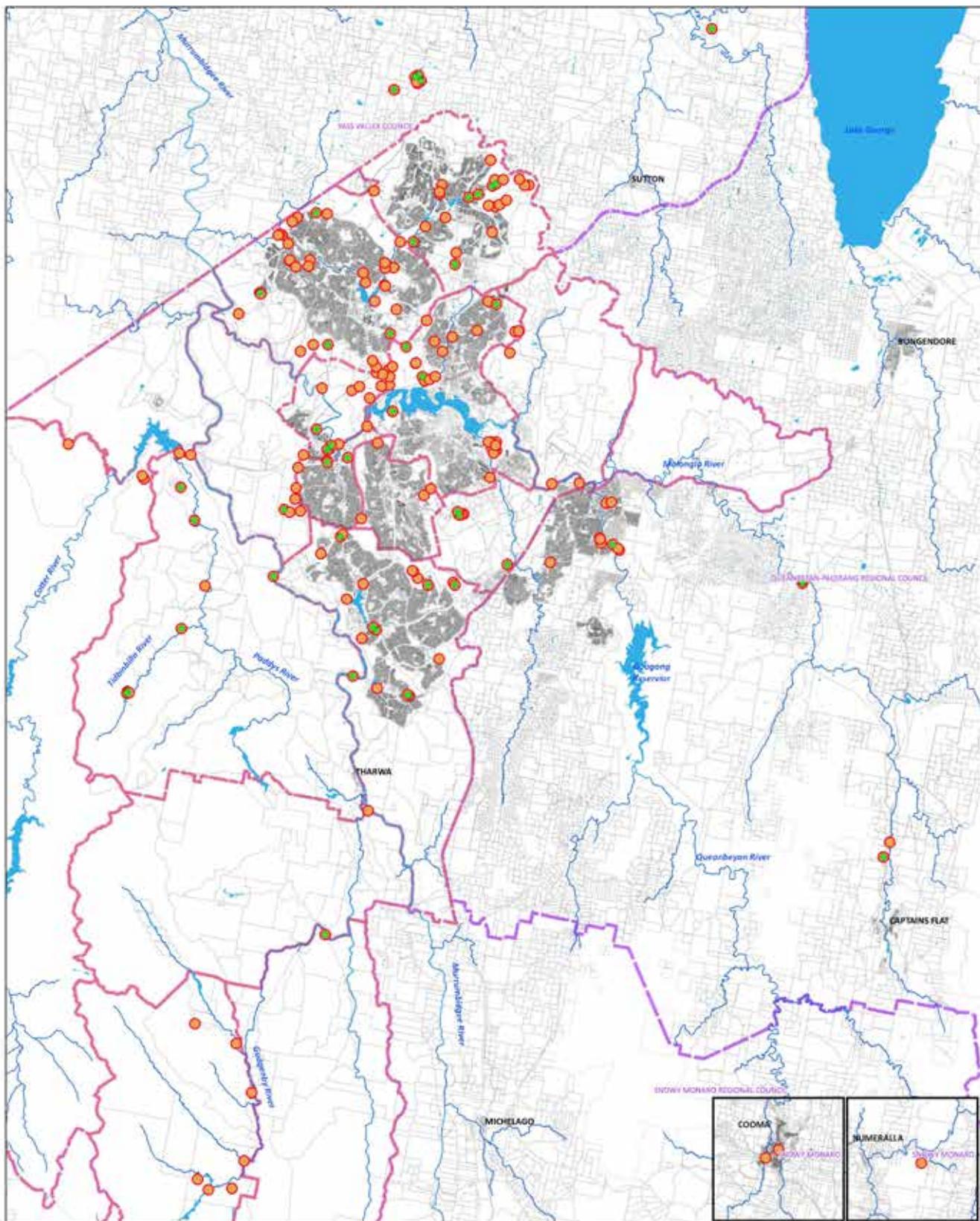


Figure 10: Number of *Litoria peronii* detected vs total number of sites surveyed throughout October.



Legend

- | | |
|----------------------------|------------------------|
| • Species Recorded | Block / Lot Boundaries |
| ● All Frogwatch Sites 2019 | ACT Districts |
| ■ Waterbody | NSW LGAs |
| — Watercourse | |

5 0 5 10 15 20 km

Datum: GDA1994

Notes:

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Last Updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Peron's Tree-frog

Litoria peronii



All layers sourced from ACT Government's NCEmap, NSW Government's Open Data Portal, and RATM Geospatial Service. 100 Kilometres

Whistling Tree Frog - *Litoria verreauxii*



- Dark brown or black stripe in front of the eye to the base of the forelimb
- Broad brownish mid-dorsal marking
- Length = 30mm
- Call = repeated whistling “cree..., cree..., cree...”

The Whistling Tree Frog s *Litoria verreauxii* significantly declined over the past 20 years, most likely caused by the emergence of the chytridiomycosis fungus in the ACT during the 1990s. This species is now re-expanding its distribution and prefers well established and well vegetated riparian zones. .

In the October 2019 FrogCensus *Litoria verreauxii* was recorded during 77 surveys and at 40 sites.

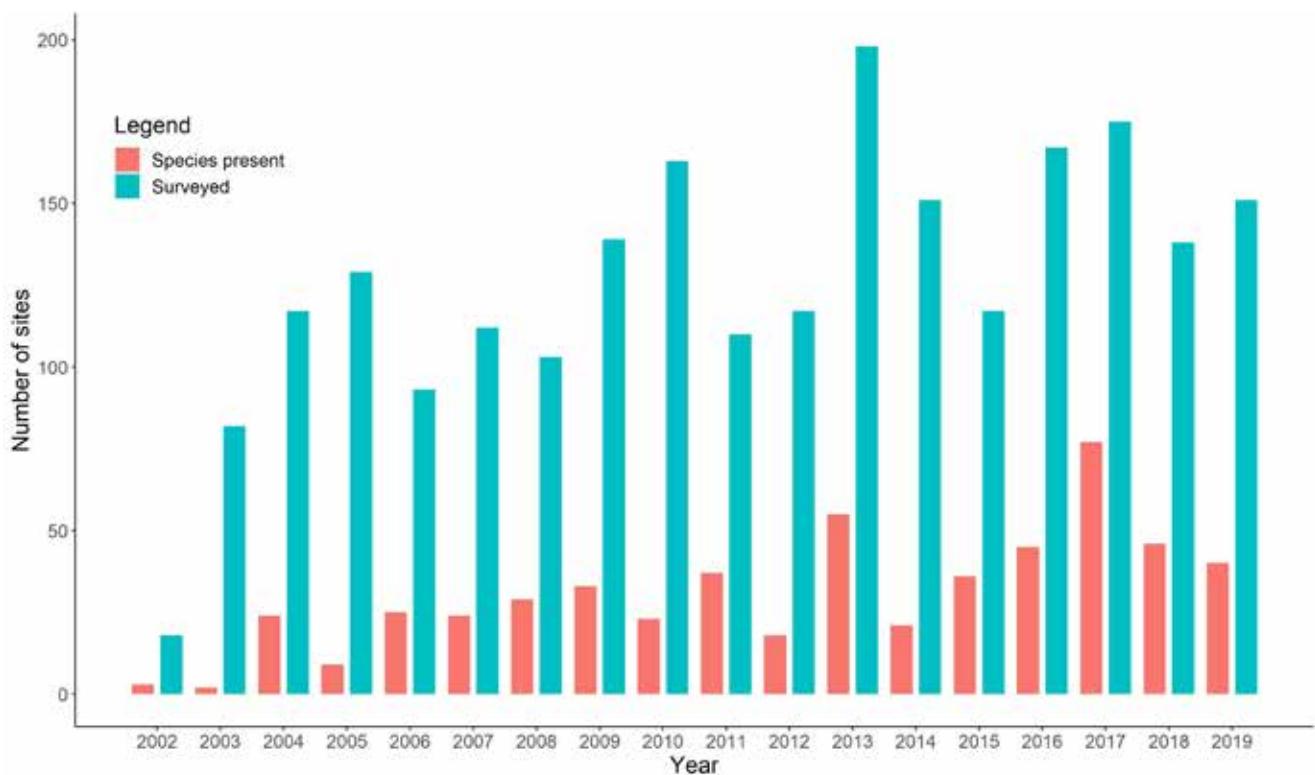
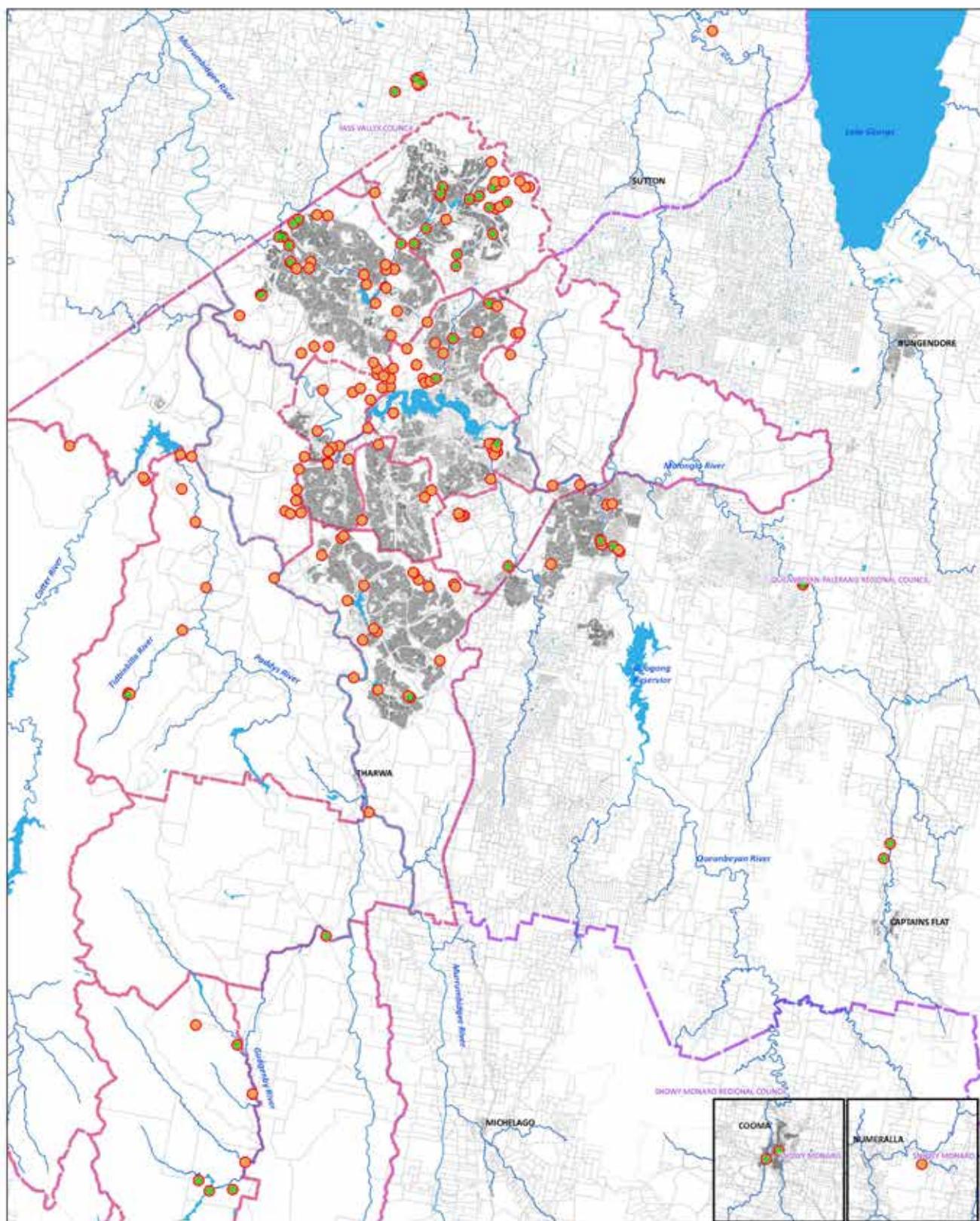


Figure 11: Number of *Litoria verreauxii* detected vs total number of sites surveyed throughout October.



Legend

- Species Recorded
- All Frogwatch Sites 2019
- Waterbody
- Watercourse
- Block / Lot Boundaries
- ACT Districts
- NSW LGAs

5 0 5 10 15 20 km

Notes:

A total of 189 sites were surveyed during the 2019 Frogwatch census. All sites are displayed as 'All Frogwatch Sites 2019'. The distribution of the target species displayed in this map is then shown as an overlay as 'Species Recorded'.

Due to their distance from the majority of sites, the Cooma and Numeralla sites are shown as insets.

Last Updated: 23 February 2020

2019 Frogwatch Survey Results - Species Distribution

Whistling Tree-frog

Litoria verreauxii verreauxii



All layers sourced from ACT Government's All Targets WGS84
Government's Digital Data Portal, and NSW Government's Map

Smooth Toadlet - *Uperoleia laevigata*



- Warty appearance with an orange patch behind & in front of each thigh.
- Pale triangular patch between the eyes.
- Length = 25mm
- Call = low pitched, drawn out “wwhhrrkkkk”

The Smooth Toadlet *Uperoleia laevigata* prefers sites that have good connectivity to forests, have unmown edges, logs in the riparian zone and are free of Eastern gambusia *Gambusia holbrooki*, an introduced predatory fish. In addition, it is believed this species has a strong preference for ponds with low electrical conductivity. This is especially true of urban sites where the majority of the FrogWatch sites occur.

The October 2019 FrogCensus *Uperoleia laevigata* was recorded during 30 surveys and at 15 sites.

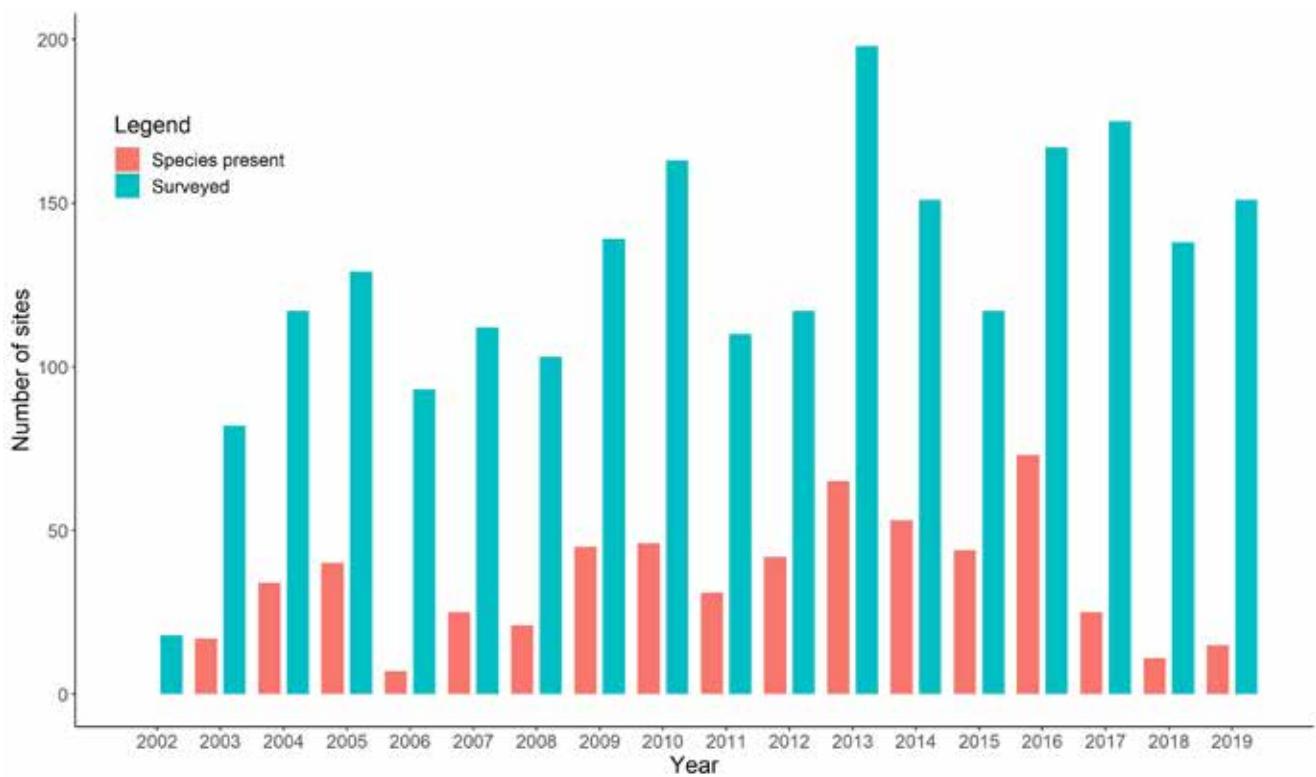
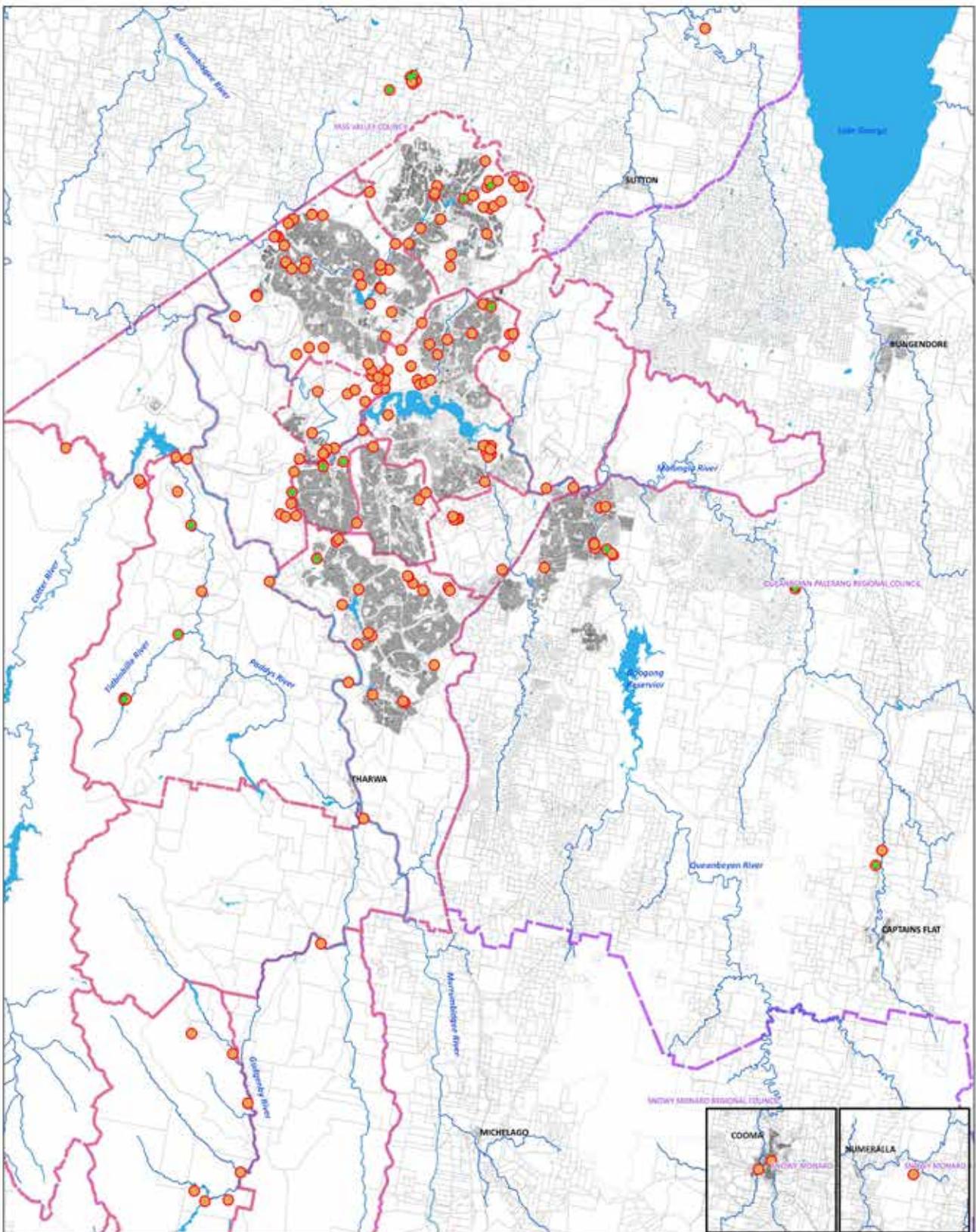


Figure 12: Number of *Uperoleia laevigata* detected vs total number of sites surveyed throughout October.



Legend

- ◆ Species Recorded
- ◆ Block / Lot Boundaries
- All Frogwatch Sites 2019
- ACT Districts
- Waterbody
- Watercourse

5 0 5 10 15 20 km
Datum: GDA1994

Notes:

A total of 189 sites were surveyed during the 2019 Frogwatch census. All sites are displayed as 'All Frogwatch Sites 2019'. The distribution of the target species displayed in this map is then shown as an overlay as 'Species Recorded'.

Due to their distance from the majority of sites, the Cooma and Numeralla sites are shown as insets.

Last Updated: 28 February 2020

2019 Frogwatch Survey Results - Species Distribution

Smooth Toadlet

Uperoleia laevigata



All layers sourced from ACT Government's ACTmap, NSW Government's Open Data Portal, and 50m Government 50K Maps.

Appendix A: Table of all FrogWatch sites monitored during the 2019 FrogCensus.

including the pond level, the number of site surveys and the number of species detected at each site. Pond level: 1=Dry; 2=nearly dry; 3=bank very exposed; 4=nearly full; 5=Full. Frog species: A=*Crinia parinsignifera*; B=*Crinia parinsignifera*; C=*Limnodynastes dumerilii*; D=*Lim. peronii*; E=*Lim. tasmaniensis*; F=*Litoria lesueuri*; G=*Lit. peronii*; H=*Lit. verreauxii*; I=*Uperoleia laevigata*.

Location	Latitude	Longitude	State	Pond Level	# of surveys	# of species	species
AMA100: Upper Ginninderra Creek, Amaroa Pond	-35.1672	149.1209	ACT	4	2	5	A, B, C, E, H
ANB100: National Botanic Gardens	-35.2781	149.1101	ACT	4	2	4	B, C, D, G
ANU012: Dickson Rd/Clunies Ross Str dam	-35.2805	149.1117	ACT	3	2	3	C, D, E
ANU019: Sullivan's Creek near corner of Daley Rd and Ward Rd	-35.2797	149.1151	ACT	4	2	1	C
ANU021: Creek, next to building 45.	-35.2779	149.1191	ACT	3	2	2	E, H
ARA100: Aranda Paddock Dam, adjacent to William Hovell Drive.	-35.2764	149.0779	ACT	1	1	0	
ARA200: Dam near gate on Bindubi Street and straight N of ARA100	-35.2730	149.0775	ACT	1	1	0	
ARA300: Aranda bush dam	-35.2747	149.0853	ACT	3	3	2	A, B
BIL100: Billabong Park stormwater retention pond, Watson	-35.2340	149.1553	ACT	4	2	4	A, B, E, H
BMT100: Black Mountain Dam SW	-35.2726	149.0890	ACT	1	1	0	
BON200: Stranger Pond Bonython at BBQ shelter	-35.4296	149.0714	ACT	5	1	3	A, B, C
BON300 Upper Stranger Pond Bonython	-35.4246	149.0814	ACT	4	1	3	B, C, G
BSW001: Banksia Street Wetland - O'Connor	-35.2576	149.1180	ACT	4	2	4	B, C, D, E
CAV100: Caves Quarry Dam, Pierce's Creek Forest	-35.3447	148.9420	ACT	4	2	3	B, C, G
CBR001: Callum Brae Site 1	-35.3567	149.1412	ACT	3	1	1	A
CBR002: Callum Brae Site 2	-35.3571	149.1398	ACT	1	1	0	
CBR003: Callum Brae Site 3	-35.3573	149.1379	ACT	3	1	2	A, G
CBR004: Callum Brae Site 4	-35.3555	149.1370	ACT	3	1	3	A, B, G
CEQ100: Canberra Equestrian Park, Pond 1, Chapman.	-35.3563	149.0150	ACT	4	2	3	B, E, G
CEQ200: Canberra Equestrian Park, Pond 2, Chapman.	-35.3577	149.0188	ACT	3	1	0	
CFR200: Hodgman Property, large dam	-35.35487	149.4420	NSW	3	2	7	A, B, C, E, G, H, I
CFR300: Molonglo River, just off Captains Flat Rd	-35.5401	149.4463	NSW	1	2	4	B, C, D, H
CGH050: Hospital Creek, Namadgi National Park	-35.7481	148.9879	ACT	4	1	4	C, D, E, H
CHC300: Calvary Hospital Ponds	-35.2537	149.0859	ACT	4	2	3	B, E, G
CMC100: Cooleman Ridge, Old Dam	-35.3570	149.0253	ACT	1	2	0	
CMC600: Mount Neighbor Horse Paddock Dam	-35.3813	149.0414	ACT	3	2	3	A, E, I
CMC700: Vikings BMX Park, Kambah	-35.3712	149.0549	ACT	4	2	3	B, E, G
CMC750: Fisher Dam, Fisher	-35.3699	149.0555	ACT	3	2	1	A

CMM200: Stormwater Settling Pond, Gordon	-35.4581	149.0830	ACT	4	2	2	B, D
CON100: Conder Wetlands, pond A	-35.4622	149.1057	ACT	4	4	6	A, B, C, E, G, H
CON110: Conder Wetlands, pond B	-35.4615	149.1046	ACT	4	2	5	A, B, C, E, G
C00013: Cooma Back Creek at Lambie Gorge	-36.2413	149.1163	NSW	3	2	2	C, H
C00100: Cooleman Ridge, North-west Dam, off Kathner Street	-35.3501	149.0226	ACT	1	2	0	
C00580: Cooma Creek at Skatepark	-36.2341	149.1295	NSW	4	1	4	B, C, E, H
CRA300: Crace, Wells Station and Gungahlin Dr	-35.2062	149.1319	ACT	4	1	2	A, H
CRW001: Crace Wetland Pond 1	-35.2005	149.1017	ACT	5	2	6	A, B, D, E, G, H
CTP450: Murrays Corner	-35.3636	148.9521	ACT	3	1	5	B, C, E, G, I
CTP500: Tanners Flat Creek Bridge	-35.4012	148.9604	ACT	3	1	3	A, B, E
CTP510: Tidbinbilla River on Paddy's River Road	-35.4261	148.9444	ACT	3	1	6	A, B, C, E, G, I
CTT100: Lower Tuggeranong Creek	-35.4072	149.0601	ACT	4	2	0	
CTT300: Upper Tuggeranong Creek, Theodore	-35.4405	149.1261	ACT	4	3	2	B, C
DGP001: Dunlop Grasslands Dam	-35.1850	149.0332	ACT	5	2	4	A, B, D, G
DIW100: Dickson Wetland, Hawdon Street	-35.2508	149.1479	ACT	4	2	1	B
DUF100: Narrabundah Hill, Southern dam	-35.3437	149.0230	ACT	3	3	4	A, B, E, I
DUFF200: Narrabundah Hill, North Dam	-35.3320	149.0241	ACT	2	2	2	B, E
DUF300: Dam near bushfire memorial	-35.3246	149.0278	ACT	2	3	1	A
FAD100: Fadden Hills Silt Pond	-35.3980	149.1170	ACT	4	3	4	B, D, E, G
FAD300: Wanniassa Hills Dam	-35.3942	149.1098	ACT	1	2	0	
FAR001: Farrer Ridge Dam 1	-35.3904	149.1066	ACT	1	1	0	
FAR002: Farrer Ridge Dam 2	-35.3901	149.1060	ACT	1	1	0	
FBM100: Glenloch interchange dam	-35.2833	149.0871	ACT	4	2	0	
FBM200: Black Mountain Storage Yard Pool	-35.2705	149.1051	ACT	1	2	0	
FBM300: Black Mountain Path Pool	-35.2703	149.1053	ACT	1	1	0	
FBM400: Black Mountain Dam Belconnen Way	-35.2612	149.0982	ACT	3	4	4	A, B, E, G
FBM500: Black Mountain, Fire Trail dam SW	-35.2786	149.0872	ACT	1	1	0	
FBP001: West Belconnen Pond, GPT Outflow Point	-35.1879	149.0201	ACT	5	2	2	A, H
FER100: Fernhill Technology Park pond, Bruce	-35.2397	149.0908	ACT	4	2	1	B
FGC009: Jarramlee Pond Dunlop	-35.2031	149.0140	ACT	5	4	6	A, B, C, D, E, H
FGC010: Lake Ginninderra and College Creek Junction, Lawson	-35.2258	149.0821	ACT	4	1	0	
FGC020: College Creek, Lawson	-35.2263	149.0828	ACT	2	1	2	B, C
FGC029: Fassifern pond	-35.1981	149.0096	ACT	4	4	4	A, C, E, H

FGC030: Gooromon Ponds Creek, Dunlop	-35.1976	149.0078	ACT	3	4	3	A, B, H
FGC031: Ginninderra Creek above confluence with Gooromon Ponds Creek	-35.1983	149.0068	ACT	4	2	2	A, H
FGC040: Diddam's Close beach, Lake G	-35.2246	149.0689	ACT	5	1	0	
FGC090: Ginninderra Creek Billabong, at Macgregor, via Crago Place	-35.2128	149.0151	ACT	4	3	3	B, E, H
FGD005: John Knight Park Pond, Belconnen	-35.2125	149.0154	ACT	1	1	0	
FGD020: O'Connor Ridge Dam	-35.2353	149.0755	ACT	4	4	1	C
FGD040: Aranda Bushland Dam	-35.2456	149.1123	ACT	3	2	1	B
FGG010: Giralang Pond, Giralang	-35.2772	149.0823	ACT	4	3	2	A, B
FGW100: Umbagog Park, Latham, Eastern Boardwalk Bog	-35.2156	149.0883	ACT	4	2	2	B, C
FMC020: Queanbeyan River at River Reserve Barracks Flat	-35.3718	149.2381	NSW	3	1	1	C
FMC040: Buttle's Creek, Queanbeyan aka BUT095	-35.3486	149.2412	NSW	2	3	2	B, C
FMC045: Buttle's Creek Queanbeyan	-35.3480	149.2448	NSW	2	2	1	B
FMC200: Mt Majura Dam, bottom, via McKenzie St.	-35.2510	149.1745	ACT	3	1	0	
FMC210: Mt Majura Nature Reserve, top dam, via McKenzie St	-35.2506	149.1769	ACT	3	2	0	
FMC230: Mt Majura dam at saddle - Doogie Dam	-35.2632	149.1710	ACT	3	1	1	A
FMF320: Justice Robert Hope Park Dam	-35.2355	149.1610	ACT	3	2	5	A, B, E, G, I
FMW010: David St Wetland, O'Connor	-35.2633	149.1239	ACT	4	3	2	D, E
FOR001: Forde Wetland between Horse Park Drive and Neil Harris Crescent	-35.1742	149.1399	ACT	3	3	7	A, B, C, D, E, H, I
FOR002: Forde Pond	-35.1723	149.1466	ACT	4	3	5	A, B, E, G, H
FRA201: Halls Creek, Fraser	-35.1854	149.0409	ACT	4	1	1	B
FTB010: Bogong Creek, Namadgi National Park	-35.7491	148.9713	ACT	3	2	4	B, C, E, H
FTD015: Tidbinbilla Nature Reserve, Vets Centre	-35.4630	148.9072	ACT	2	1	1	B
FTD120: Tidbinbilla Nature Reserve, Boardwalk Pond	-35.4641	148.9069	ACT	4	1	2	B, H
FTP100: Isabella Pond	-35.4636	148.9084	ACT	1	1	0	
GCC100: Condor Creek on Brindabella Road Bridge	-35.3210	148.8624	ACT	3	1	2	B, C
GIN002: Amaroo, Footbridge at Mirrabei Drive	-35.1727	149.1194	ACT	5	2	2	B, E
GIN007: Ginninderra Creek d/s of Barton Highway, Giralang	-35.2007	149.0925	ACT	3	4	2	B, H
GIN009: Ginninderra Creek, downstream of Lake Ginninderra dam wall	-35.2190	149.0670	ACT	5	2	0	
GIN024: Ginninderra Creek at Umbagog Stepping Stones, Latham	-35.2158	149.0284	ACT	3	2	2	C, D
GUN001: Gungahlin Pond	-35.1916	149.1099	ACT	4	3	3	A, B, D
GUN100: Gungahlin Scout Hall Dam	-35.1861	149.1238	ACT	5	2	4	A, B, D, E

GUN110: Gungahlin Scout Hall Dam EAST,	-35.1862	149.1239	ACT	5	2	3	A, B, E
HAL001: Halls Creek Showground Bridge, Hall	-35.1716	149.0735	ACT	2	1	1	C
HAR001: Harrison pond	-35.1940	149.1568	ACT	5	2	2	A, H
HMD000: O'Malley Pond, Hindmarsh Drive	-35.3464	149.1130	ACT	5	2	1	B
HOL100: Holder drainage channel	-35.3277	149.0443	ACT	2	1	1	B
HOL110: Holder wetlands site, btw Cotter Rd and Dixon Dr	-35.3286	149.0446	ACT	4	2	5	A, B, E, G, I
JER020: Jerrabomberra Creek, Lanyon Drive Bridge	-35.3853	149.1726	NSW	3	2	4	A, C, G, H
JER300: Jerrabomberra Dairy Creek - Mill Creek	-35.3353	149.1591	NSW	3	2	3	A, B, E
JER500: JWs - Kelly's swamp @ Bittern Bird hide, WL#19	-35.3148	149.1630	ACT	5	2	5	A, B, D, E, H
JER510: JWs - East of billabong, WL#22	-35.3196	149.1632	ACT	4	2	3	A, B, E
JER520: JWs - Billabong, WL#21	-35.3189	149.1617	ACT	4	2	4	A, B, D, E
JER530: JWs - Silt trap north, WL#18	-35.3180	149.1597	ACT	5	2	1	B
JER540: JWs - between billabong and industrial estate, WL#24	-35.3211	149.1613	ACT	4	2	3	A, B, E
JER550: JWs - Jerra Creek Bridge done from board walk, WL#17	-35.3148	149.1592	ACT	5	2	1	E
JER560: JWs - Fulica Hide, WL#16	-35.3149	149.1576	ACT	5	2	0	
JER570: JWs - Kelly's swamp, southern end, WL#19	-35.3167	149.1625	ACT	4	2	4	A, B, D, E,
KAM150: North Kama, south dam	-35.2610	149.0330	ACT	1	1	0	
KAM200: Kama Horse Paddocks Dam 2, off William Hovell Drive	-35.2650	149.0241	ACT	1	1	0	
KIP001: Kippax Creek, Holt	-35.2163	149.0196	ACT	2	2	3	B, C, D
LDM100: Lookout Dam, Holt	-35.2440	148.9802	ACT	1	2	0	
LWP100: Little Whiskers Rd, Pond Site	-35.3921	149.3804	NSW	4	9	5	A, B, E, G, I
LWR100: Little Whiskers Rd, River Site	-35.3907	149.3807	NSW	3	7	6	B, C, D, E, G, H
LYW010: Lyneham Wetland	-35.2547	149.1305	ACT	4	3	3	A, C, H
MCW001: McKellar wetland, constructed 2000	-35.2160	149.0826	ACT	4	2	3	A, B, C
MCW002: McKellar wetland, constructed 2004	-35.2130	149.0821	ACT	4	3	3	A, B, E
MFL002: Second pond from entrance	-35.1674	149.1562	ACT	4	2	4	A, B, G, H
MFL003: Shearing Shed Dam	-35.1661	149.1588	ACT	3	3	3	A, G, I
MFL005:	-35.1638	149.1578	ACT	1	3	1	A
MFL007: Mulligans Flat Site 7	-35.1636	149.1638	ACT	3	2	1	A
MFL008: In northern section of park,	-35.1525	149.1547	ACT	1	1	0	
MFL011: Large dam near southern border	-35.1793	149.1584	ACT	2	3	0	
MFL012: near bird site number 8	-35.1780	149.1615	ACT	1	3	0	
MFL013: Dam in SE of reserve near bird site 7	-35.1753	149.1664	ACT	3	3	2	A, H

MFL014: most easterly dam in park	-35.1664	149.1819	ACT	3	2	0	
MFL016: Eastern end of reserve	-35.1666	149.1789	ACT	3	2	1	A
MFL017: Eastern side of reserve	-35.1631	149.1751	ACT	1	2	0	
MFL023: Daisy Gate Small dam	-35.1787	149.1539	ACT	3	3	1	A
MIR100: Drain into Ginninderra Creek	-35.1714	149.1194	ACT	4	2	5	A, B, C, E, H
MIT100: Gungahlin Cemetery, Mitchell	-35.2130	149.1314	ACT	4	2	4	A, E, G, H
MOL250: Clos Crossing	-35.3180	149.0524	ACT	5	2	1	B
MOL350: Misery Point	-35.3188	149.0471	ACT	5	2	3	A, B, G
MOL360: Happy Point	-35.3097	149.0365	ACT	5	2	3	A, B, G
MOL400: Coppin's Crossing	-35.2859	149.0398	ACT	3	1	2	A, B
MOL602: Beard Creek 1	-35.3382	149.2026	ACT	2	2	0	
MOL605: Molonglo River Downstream at Oaks Estate Rd Causeway	-35.3374	149.2219	ACT	3	2	0	
MYA050: Yarralumla Creek	-35.3074	149.0720	ACT	4	1	3	A, B, C
MYA100: Yarralumla Ck, Curtin Oval	-35.3167	149.0797	ACT	3	1	1	C
NAD011: National Arboretum Dam	-35.2911	149.0734	ACT	3	3	3	A, B, E
NAD034: National Arboretum Dam near Cork oak Lot 34	-35.2840	149.0814	ACT	1	2	0	
NAD036: National Arboretum Larch Dam Forest 36	-35.2869	149.0608	ACT	3	3	0	
NAS100: Southern Tablelands Enviro Park	-35.2846	149.0661	ACT	4	3	0	
NBP001: Southern pond at Nursery Inlet	-35.2985	149.0897	ACT	3	2	1	E
NBP002: Northern pond at Nursery Inlet	-35.2984	149.0897	ACT	4	2	2	A, G
ORA002: Orana School Dam	-35.3256	149.0589	ACT	3	4	5	A, B, E, G, I
ORR100: Orroral Valley: Rock waterfall Stream, Namadgi NP	-35.6646	148.9889	ACT	5	1	3	B, C, H
ORR200: Orroral Valley, Nursery Swamp Trail.	-35.6536	148.9594	ACT	1	1	0	
OSR001: Dam 1. Front gate	-35.1076	149.1047	NSW	4	1	4	A, E, G, H
OSR002: Dam 2	-35.1045	149.1028	NSW	4	1	5	A, B, E, G, H
OSR003: Dam 3. Big back dam	-35.1055	149.1004	NSW	4	1	4	B, E, G, H, I
OSR004: Dam 4 Swim Dam	-35.1062	149.1019	NSW	4	1	2	A, E
OSR005: Dam 5. Hidden Dam	-35.1092	149.1024	NSW	2	1	0	
OSR006: Dam 6	-35.1083	149.1016	NSW	4	1	3	A, B, E
PA100: Mt Painter, Wildflower Triangle Dam	-35.2695	149.0749	ACT	1	2	0	
PCF000: Cotter River at Thompsons Flat	-35.3250	148.9405	ACT	3	1	1	B
PCF001: Dam near Pierces Creek	-35.3402	148.9160	ACT	1	2	0	
PCF002: Pierces Creek	-35.3385	148.9148	ACT	3	2	0	

PIN100: Pinnacle Dam, Hawker	-35.2608	149.0433	ACT	3	2	3	A, B, G
PIP010: Pipeline Creek Reserve, Jerrabomberra	-35.3835	149.2027	NSW	5	1	3	A, B, E
QBN010: 33 Lonergan Drive, Greenleigh	-35.3724	149.2464	NSW	3	5	4	B, E, G, I
QBN450: Queanbeyan River at Doeberl Reserve	-35.3756	149.2511	NSW	4	1	2	B, C
QBN455: Queanbeyan River adj Barracks Flat Drive east of Doerbel St.	-35.3746	149.2501	NSW	4	1	2	B, C
QBN465: Queanbeyan River adj Dane St	-35.3689	149.2373	NSW	4	2	2	B, C
QBN466: Queanbeyan River adj Dane St	-35.3694	149.2375	NSW	4	2	3	B, C, H
RCD001: Rose Cottage horse paddock 8 and Dam	-35.3963	149.1348	ACT	4	1	2	A, B
RCD002: Rose Cottage paddock 7 dam	-35.3978	149.1361	ACT	3	1	4	A, B, E, G
RED100: Red Hill nature park	-35.3425	149.1177	ACT	1	1	0	
SFF100: Stromlo Forest Retention Dam	-35.3215	149.0443	ACT	4	2	2	B, G
SFF101: Stromlo Forest Retention Dam	-35.3213	149.0444	ACT	4	2	2	B, G
STR100: Strathnairn Gallery Main Pond	-35.2317	148.9947	ACT	4	2	5	A, B, E, G, H
STP150: Strathnairn Gallery Southern pond	-35.2324	148.9953	ACT	3	2	2	A, B
STW009: West Belconnen Pond Inflow	-35.1903	149.0166	ACT	5	2	2	B, H
TAV200: Mt Taylor Dam 2	-35.3606	149.0692	ACT	4	1	1	A
TGC100: Glendale Crossing, Namadgi NP	-35.6926	149.0004	ACT	4	1	2	C, F
TGN200: Gudgenby River below Naas Crossing	-35.6007	149.0500	ACT	4	1	6	A, B, C, E, G, H
TMC100: Middle Creek, Namadgi NP	-35.7433	148.9635	ACT	4	1	3	B, C, H
TRA100: Travica property, Gundaroo, Lower Dam	-35.0740	149.3076	NSW	3	3	3	A, B, G
TRC100: Rendezvous' Creek, Namadgi NP	-35.7321	148.9961	ACT	4	1	2	C, F
TUG100: North-East Lake Tuggeronong	-35.3983	149.0716	ACT	3	1	4	A, B, C, E
UMD004: Tharwa Sandwash, Tharwa	-35.5289	149.0785	ACT	4	2	2	A, B
UMD005: Point Hut Crossing, Gordon	-35.4515	149.0657	ACT	4	2	3	A, B, G
UMD006: Kambah Pool, Kambah	-35.3949	149.0083	ACT	4	1	1	G
WEE100: Weemalla, Fairview Rd	-35.1131	149.0860	NSW	3	2	4	A, G, H, I

Appendix B: List of all trained volunteers that contributed to the 2019 FrogCensus.

Please note: Volunteers always work in teams of at least two. Therefore, for every listed volunteer, at least one other unnamed volunteer contributed to the program.

Alannah Alley Freeman	Jenny Clarke	Peter Watson
Anke Maria Hoefer	Jeremy Wisbey- team	Philip Dunne
Antia Brademan	Jess F	R Peterson
Ann Milligan	Jim Arnold	Renee Gonlag
ANU Green Team	John B	Renee Gonlag
Brett	John Schmidt	Ro McFarlane
Brett Goyne	Karen Ward	Robert Gifford
Bruce Cowell	Kathy Eyles	Rodney Ubrihien
Cameron Whitnall	Kati Gorgenyi	Roger Hnatiuk
Cedric Bear	Kerry Webber	Rosemary R
Chris FitzGerald	Keyama-Mio Hoefer-Dunne	Ross Benton
Chris Taylor	Lachlan Duncan	Ross Robinson
Cooma Waterwatch	Landcarers from Cooma	Ruby McFarlane
Danial Stratford and son	Lauren Smith	Ryu Callaway
Danielle Murphy	Leone Janson	S Peterson
Danswell Starrs	Lesley Henstridge	Samantha
Darcy O'Rourke	Lily Watson	Samuel Jones
Deb Kellock	Linda Beverage	Sarah Hnatiuk
Dianna Fitzsimons	Lola-Lee-Lou Hoefer-Dunne	Sharon Koh
Emily Brooks	Luke	Shelley Owen
Emma Keightley	Mark Smith	Skye
Evan	Martin Lind and family	Stef Benton
Felix McFarlane	Maxine Webber	Tasha
Fiona Spier	Melissa Parker	Tim Yiu
Fleur Horan	Michael Bedingfield	Tom McElroy
Frances FitzGibbon	Milou Hoffman	Tony Tsai
Friends of Black Mountain	Mt Majura Scouts group	Tony Webber
Friends of Jerrabomberra Wetlands	Nadia Travica	various property owners
Friends of Mulligans Flat	Nat O'Rourke	Vera Kurz
Friends of Tidbinbilla	Nicholas Loades	Wendy Hodgman
Gavin Holmes	Nick Loades	Wendy Schmidt
Helen Austin	Nina McLean	Woo O'Reilly
Helen Cross	Paul	Xantia McFarlane
Jeanine Godkin	Paula Banks	
Jenny Berget and children	Penelope Lilley	
	Penny	

Appendix C: Scientific and common names of local frog species.

Scientific name	Common name
<i>Crinia parinsignifera</i>	Plains Froglet
<i>Crinia signifera</i>	Common Eastern Froglet
<i>Limnodynastes dumerilii</i>	Pobblebonk, Eastern Banjo Frog
<i>Limnodynastes peronii</i>	Brown/Striped Marsh Frog
<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog
<i>Litoria lesueuri</i>	Stony Creek Frog
<i>Litoria peronii</i>	Emerald-spotted Tree Frog
<i>Litoria verreauxii</i>	Whistling Tree Frog
<i>Uperoleia laevigata</i>	Smooth Toadlet

