

Terrestrial and Aquatic Ecology Monitoring

2019

Terrestrial and Aquatic Ecology Monitoring

Under the bulk entitlement for the Anglesea borefield, Barwon Water has established a comprehensive Monitoring and Assessment Program (MAP) that has been reviewed by independent experts and approved by the Minister for Water. The objective of the MAP is to protect environmental values and the health of groundwater dependent ecosystems, whilst also continuing to collect data to build our understanding of the long-term sustainability of groundwater resources in the Anglesea area.

The terrestrial and aquatic ecology monitoring component of the MAP consists of vegetation, frog, fish, and macroinvertebrate surveys. We capture information over time to assess any changes and to ensure operation of the Anglesea borefield is not having detrimental impacts on ecology.



Picture 1: Anglesea Swamp, October 2019 (Ecology Australia, 2019)

What we are doing

We undertake aquatic ecology monitoring annually in spring.

We conduct terrestrial ecology monitoring annually if the borefield is operating, and every second year when the borefield is not operating.



Picture 2: Ecology Australia conducts its terrestrial and aquatic ecology surveys near Anglesea.



Picture 3: Endangered Otway Bush Yabby *Geocharax tasmanicus* is discovered during Ecology Australia's aquatic and ecology survey last year.

Ecology Australia has completed the terrestrial and aquatic ecology surveys for 2019. Surveys were undertaken from spring to early-summer 2019. This included monitoring in both the Anglesea Swamp and Anglesea Estuary. The surveys included:

- Vegetation surveys along six permanent transects in the swamp and four permanent transects in the estuary. Data collected included plant species, ecological vegetation classes (EVCs), plant functional groups, bare ground cover and water depth.
- Frog survey data collected at eight sites in the Anglesea Swamp and four sites in the Anglesea Estuary included species richness (the number of different species), abundance, water quality and habitat attributes.
- Aquatic monitoring included targeted surveys for Southern Pygmy Perch at two sites and macroinvertebrate sampling at three sites. Diversity, abundance, biometrics (length and weight of fish), water quality and habitat attributes were all recorded.

What we have found

Vegetation has remained largely unchanged in the Anglesea Swamp and Anglesea Estuary.

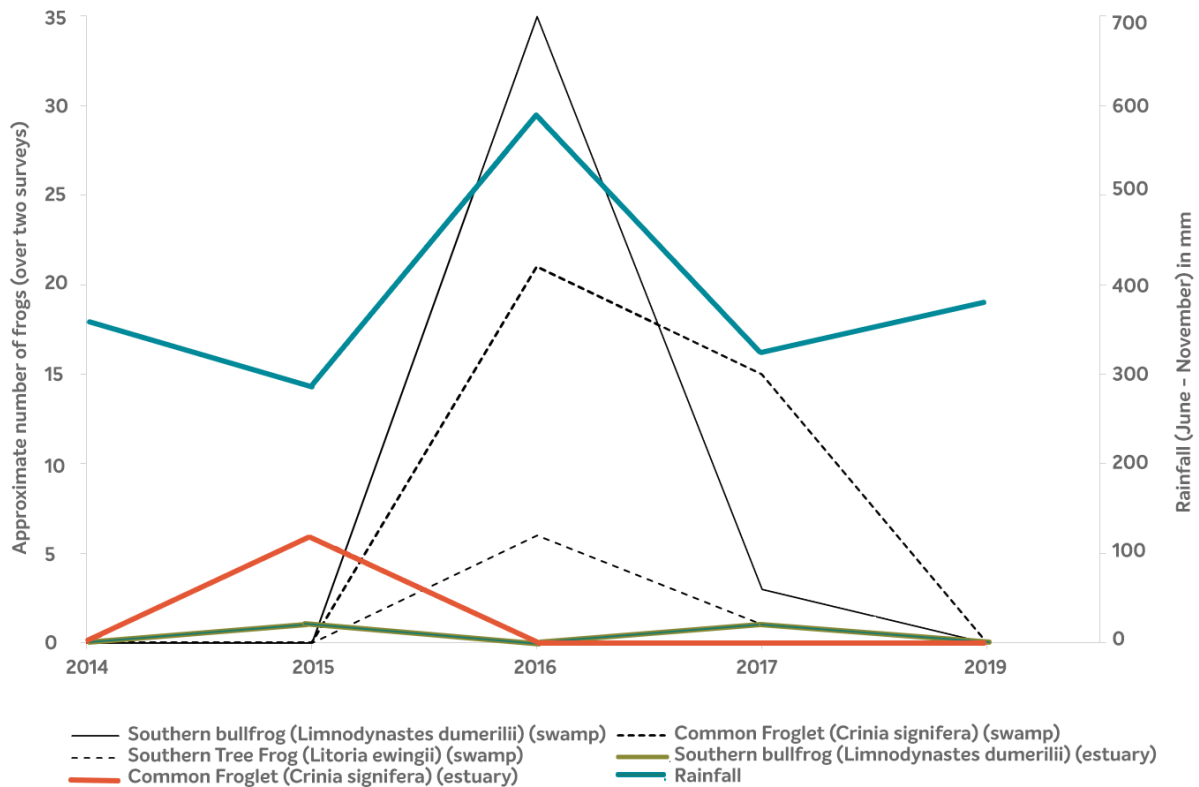
No weed species were recorded in the swamp. Weed species were recorded in the estuary; however, there were higher numbers of native species than weed species and the number of different weed species in the estuary has not increased significantly since 2015. The presence of weed species in the estuary and not the swamp is likely to be a result of increased public accessibility and recreational activities in this area.

Native species richness (the number of different species) at any one site ranged from 8–16 in the swamp and 8–13 in the estuary.

Frog survey results were similar to previous years with low numbers and diversity of frogs in both the swamp and estuary. Only one frog, a Southern Bullfrog, was sighted during surveys.

However, other frogs were heard calling at least 100 m from the survey sites, indicating that there are frogs in the broader area. Little standing water and high acidity - typical for this area - can reduce frog reproduction, so areas within the Anglesea catchment are unlikely to be favourable for frog reproduction.

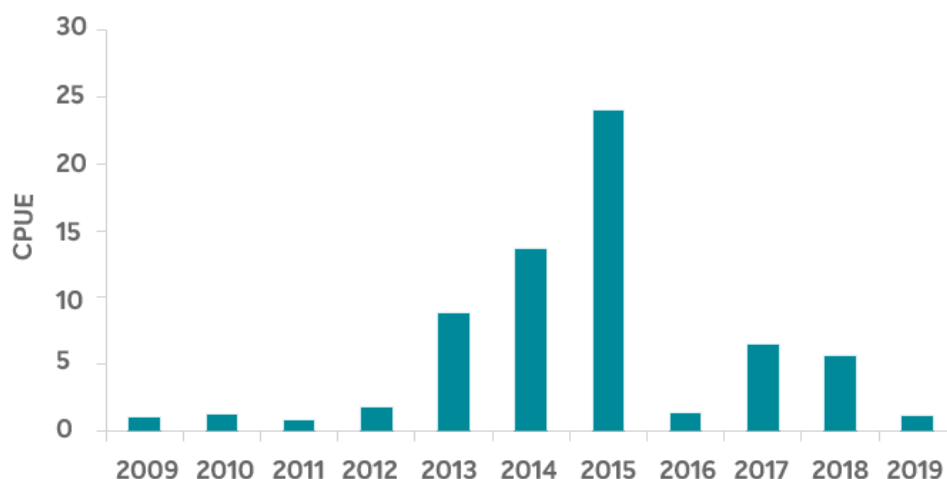
Since 2014, recorded frog numbers have been low and largely reflective of rainfall. Greatest numbers were recorded in 2016 when rainfall was above average and standing water was observed at some sites. Without longer-term data, we do not know if this has always been the case. We need longer-term data to determine whether this lack of frog habitat is a long-term situation.



Graph 1: Approximate number of frogs recorded in spring surveys at all monitoring sites

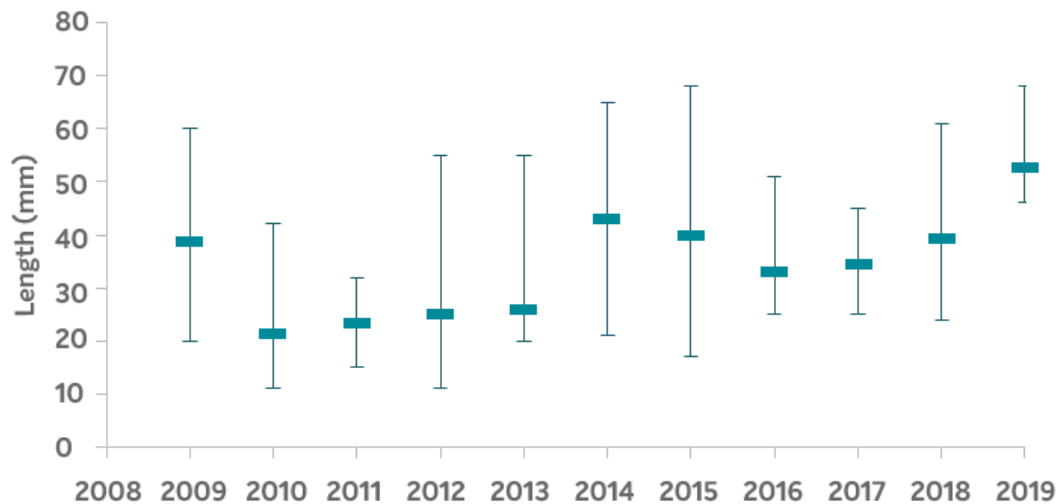
Two surveys were undertaken in each year, except for 2014, when sites were surveyed once.

Southern Pygmy Perch were observed in one of the two monitoring sites. No recruitment (breeding and survival of young fish) was detected and fish length measurements suggest the population is dominated by older fish. While recruitment is more reliably detected in autumn (not spring), previous monitoring undertaken in autumn in the Anglesea catchment has not been as successful as spring monitoring due to the lack of surface water for sampling following the dry summer period.



Graph 2: Southern Pygmy Perch recorded at Salt Creek

This graph shows the Catch Per Unit Effort (CPUE) and variation in the number of Southern Pygmy Perch recorded from 2009 to 2019. This can be attributed to factors such as natural variation in climatic conditions.



Graph 3: Mean (teal bars), minimum and maximum lengths of Southern Pygmy Perch recorded at Salt Creek

Otway Bush Yabby - The most notable result from the aquatic ecological monitoring in recent years has been the detection of the endangered Otway Bush Yabby. This species had been previously recorded in Salt Creek back in 2007; however, 2017 was the first time it was recorded as part of our monitoring program and the species has been observed each year since. Based on the abundance and size ranges encountered, the population appears to be stable.



Pictured left: Endangered Otway Bush Yabby *Geocharax tasmanicus* observed in Breakfast Creek tributary. Pictured right: Southern Bullfrog *Limnodonastes dumerilii* observed at the Anglesea estuary. (Ecology Australia, 2019)

More information

For more information about the Anglesea borefield Monitoring and Assessment Program, please visit our web page: www.yoursay.barwonwater.vic.gov.au/anglesea-borefield

You can also contact a member of the project team at Barwon Water on 1300 656 007 or by emailing: info@barwonwater.vic.gov.au