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Our Ref: 2318c

1 December 2023

Matt Apostola
Development Manager
The GPT Group
Level 10 Melbourne Central Tower
360 Elizabeth Street
Melbourne VIC 3000

Dear Matt,

**Re: Growling Grass Frog Targeted Surveys,
485 Cooper Street, Epping, Victoria**

Background

Ecolink Consulting Pty Ltd was engaged by The GPT Group, on behalf of the landowner, to undertake a targeted survey for Growling Grass Frogs *Litoria raniformis* at 485 Cooper Street Epping, Victoria (the study area; Figure 1).

It is understood that the project was referred to the Department of Climate Change, Energy, the Environment and Water for potentially significant impacts to a Matter of National Environmental Significance under *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). The DCCEEW has sought additional information relating to Growling Grass Frog due to an inadequate survey effort completed to date.

The current report presents the results of a new survey for Growling Grass Frog

The purpose of this assessment is to:

- Identify the presence or absence of Growling Grass Frogs within the study area; and
- Recommend appropriate mitigation measures and implications based on relevant legislation and policies.

Growling Grass Frog *Litoria raniformis* Conservation Status and Biology

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The Growling Grass Frog is listed as Vulnerable on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Victorian *Flora and Fauna Guarantee Act 1988* Threatened List (Department of Environment Land Water and Planning 2023a).

The Growling Grass Frog is a relatively large and mobile species that inhabits a diverse range of wetlands such as swamps, marshes, slow flowing rivers/streams, lakes, drainage lines and artificial waterbodies (e.g. farm dams, reservoirs and former quarry pits) (Plate 1). The species generally breeds in permanent or near-permanent waterbodies, but has also been recorded breeding regularly in ephemeral waterbodies, where they hold sufficient water during the breeding season (Heard et al. 2004; Ecology Australia 2006).



Plate 1. Growling Grass Frog *Litoria raniformis* (Ecolink Consulting Pty Ltd).

Several key habitat attributes significantly influence the presence and/or breeding success of the Growling Grass Frog, including:

- Connectivity to occupied sites;
- Hydroperiod (i.e. water permanence);
- Cover of aquatic vegetation;
- Water quality, particularly salinity;
- Terrestrial vegetation, including overshadowing by trees and shrubs; and
- Absence of predatory fish (Ecology Australia Pty Ltd 2006; Heard et al. 2004; Heard and Scroggie 2009; Heard et al. 2010; Heard et al. 2012).

With regard to the hydroperiod of waterbodies, larger and more permanent waterbodies are more likely to be occupied and sustain populations over a longer period. The Growling Grass Frog is a highly aquatic frog. As such, the drying out of waterbodies can increase the chance of local extinctions (Heard and Scroggie 2009); however, periodic drying of wetlands can also be potentially beneficial through reducing impacts from predatory fish and/or amphibian chytrid fungus *Batrachochytrium*

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dendrobatidis, which has caused the decline of amphibians worldwide, including the Growing Grass Frog (Clemann and Gillespie 2012).

The cover of aquatic vegetation has a strong positive relationship with habitat occupancy; aquatic vegetation is characterised as submerged, floating or emergent vegetation types. The microhabitat provided by the vegetation is important for the Growing Grass Frog (Heard and Scroggie 2009), with the species showing marked preferential use of submerged and floating vegetation during nocturnal activity (Heard et al. 2008), while emergent vegetation provides sheltered perching sites for basking during the day and for ambushing prey (Pyke 2002). These plants also provide important microhabitat for aquatic larvae and are likely to serve as a refuge from predatory fish (Heard and Scroggie 2009; Webb and Joss 1997).

A number of studies have demonstrated that connectivity is a critical factor for the ongoing persistence of Growing Grass Frog populations in a given area (e.g. Heard and Scroggie 2009; Heard et al. 2010). The likelihood of a site being colonised by the species is strongly linked to connectivity, specifically the number of suitable wetlands in close proximity to the site (e.g. within approximately 1,000 m). This connectivity is essential as the species has been shown to operate under a 'metapopulation' paradigm, where sites vary in occupancy year to year, driven by local conditions and the processes of localised extinction and colonisation (Heard et al. 2013).

The Growing Grass Frog spends the non-breeding season (approximately May to September) sheltering in terrestrial environments (e.g. rocks, fallen timber, soil cracks or dense ground vegetation) some distance from water (Pyke 2002; Wassens et al. 2008; Wilson 2003). Terrestrial habitat surrounding waterbodies is important not only for providing shelter and over-wintering refuge, but also to provide a buffer from surrounding land uses (existing and future); a minimum buffer area of 200 metres is recommended around occupied wetlands (DEWHA 2009), however, subsequent modelling suggests buffers of 200 metres or less may materially increase the risk of local extinction in certain situations (Heard and McCarthy 2011). Buffer distances aim to account for distances moved by the frog during foraging at night and also movement to over-wintering sites.

The presence of predatory fish, such as Eastern Gambusia *Gambusia holbrooki*, has been implicated in the decline of Growing Grass Frogs, although, waterbodies with an extensive cover of aquatic vegetation may provide sufficient refuge and shelter for aquatic larvae to persist even in the presence of predatory fish (Heard and Scroggie 2009).

Methods

Desktop Assessment

A desktop assessment was undertaken to determine the historic occurrence of Growing Grass Frogs in the vicinity of, the study area. This involved a search of records for the species in the Department of Energy, Environment and Climate Action's (DEECA) Victorian Biodiversity Atlas (VBA) (Department of Environment Land Water and Planning 2023b).

Field Assessment

The targeted Growing Grass Frog survey included a diurnal survey and two nocturnal surveys. The diurnal survey and the first nocturnal survey were undertaken on 8 November 2023, and the second

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nocturnal survey was undertaken on 23 November 2023. The survey effort is adequate as Heard *et al* (2010) demonstrates that a threshold of 95% detection probability, at least two surveys are required when surveys are conducted in October–December, whereas three surveys are required if undertaken during January–March.

Two Survey Sites were established: one at the ephemeral wetland in the north-eastern corner of the study area and one near the ephemeral wetland in the north-western corner of the study area, both areas are artificial depressions created by previous quarries (Figure 1). Merri Creek, which extends along the western boundary of the study area provides habitat for Growling Grass Frogs, however, it will not be impacted by the proposed development, and hence was not surveyed. The survey locations ensured that the entire study area was assessed, as any calling frog could be detected at any location within the study area.

Each survey was undertaken by a single experienced assessor (Table 1). The survey effort at each of the two survey sites included active searching and call playback:

- Active surveys included the assessor actively searching on and under floating debris and organic matter, down cracks and under rocks surrounding the fringes of the wetland.
- The call playback survey methodology meant that the assessors undertook ten minutes of quiet listening, followed by approximately five minutes of call playback/mimicry followed by a further ten minutes of quiet listening.

The frog species and the number of observed individuals, as well as the approximate numbers of calling males, were recorded during each survey.

Weather conditions were suitable for frog detection with warm to mild and humid weather on each of the survey days (Table 1).

Table 1. Weather conditions during diurnal and nocturnal frog surveys at the study area.

Survey #	Diurnal	Nocturnal 1	Nocturnal 2
Date	8 Nov 2023	8 Nov 2023	23 Nov 2023
Start time	16:00	21:00	23:00
Finish time	18:30	23:30	01:00
Temperature (°C)	25.4	17.8	22.2
Humidity (%)	36	41	61
Wind speed average (km/h)	12.6	7.2	14.8
Wind direction	SSW	SSW	SSW
Rain (mm)	3.2	3.2	0
Cloud cover (Octaves)	5/8	5/8	7/8
Preceding 24 hour rain (mm)	0	0	0

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Survey Hygiene

To reduce the risk of infection and spread of amphibian disease, particularly chytrid fungus, the handling, collection and preservation was to follow standards used by the NSW National Parks and Wildlife Service (Department of Environment and Climate Change (NSW) 2008).

Habitat Assessment

The following habitat variables were measured and recorded during a Habitat conditions at the ponds were measured during the final diurnal survey:

- The location of potentially suitable habitat (Australian Map Grid co-ordinates);
- An analysis of the percentage cover of emergent, submerged, floating and fringing vegetation and terrestrial vegetation at both occupied (including sites where successful breeding is occurring) and unoccupied sites;
- Percentage cover and composition of terrestrial refuge sites (e.g. rocks, logs, debris) surrounding waterways and wetlands;
- Basic water chemistry analysis (dissolved oxygen, electrical conductivity, pH, turbidity, temperature, salinity);
- Information regarding water levels at sites;
- The type of surrounding habitat within 30 metres of each site;
- The location of potential dispersal routes and linked habitat; and,
- The presence and overall abundance of aquatic (Plague Minnow and other fish) and terrestrial predators (e.g. foxes, cats, birds).

General comments on the presence of pollutants, rubbish, refuse, or other threatening processes were made. A photograph of the survey location was taken.

Water quality

In situ water quality data was collected at each site using a YSI Pro-Plus Water Quality Meter and a HACH Q1000 Turbidity Meter. Water quality parameters measured include dissolved oxygen (mg/l and % saturation), Conductivity ($\mu\text{s}/\text{cm}$) and Specific Conductivity ($\mu\text{s}/\text{cm}$), temperature ($^{\circ}\text{C}$), pH and turbidity (ntu).

Results

The Victorian Biodiversity Atlas identifies many historical records of Growling Grass Frogs within three kilometres of the study area, this is largely attributed to the Merri Creek. None have been recorded within the areas proposed for development within the study area (Figure 2) (Department of Environment Land Water and Planning 2023b).

Survey Site 1 was located at the bottom of the eastern quarry, occurring in a slight depression across approximately 100 square metres. This depression was observed to be poor habitat for Growling Grass Frog due to the lack of standing water (and we note that the area experienced above average rainfall throughout Spring associated with the La Nina event). It was fringed by semi-aquatic vegetation, including Common Bog Sedge *Schoenus apogon* and Finger Rush *Juncus subsecundus*. Internally

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Broad-leaf Cumbungi *Typha domingensis* dominated, before a rise in the centre, gave way to more Common Bog Sedge and Finger Rush. No open water was present at the time of the survey, and in turn, submerged and emergent vegetation did not occur. The northern side of the depression was ringed by large boulders which may provide cover for some frog species. As there was no standing water, no aquatic predators were observed, Little Ravens *Corvus mellori* and Australian Magpies *Gymnorhina tibicen* were observed and would likely predate upon frogs if utilising the area, it is likely foxes and cats also depredate any frogs (Appendix 1), (Plate 2).

Survey Site 2 was located at the bottom of the western quarry, only approximately 21 square metres in area. It also, is no more than a depression, although with dimensions slightly deeper and smaller than Site 1. Historic aerial photography shows that the study area does not hold permanent water (Nearmap 2023). Survey Site 2 provides poor quality habitat for Growling Grass Frogs. Vegetation consisted, mostly of Broad-leaf Cumbungi and Common Spike-rush *Eleocharis acuta* and did not exhibit suitable conditions for breeding (Plate 3). It is expected that the depression would have dried out shortly after the surveys were complete, and this would preclude Growling Grass Frog breeding. Furthermore the pH of the water exceeded the target values for Growling Grass Frog wetland standards (Department of Environment Land Water and Planning 2017). Little Ravens were observed utilising the site and these birds may depredate any frogs.



Plate 2. Survey Site 1.

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Plate 3. Survey Site 2.

In accordance with the poor habitat recorded on site, no Growling Grass Frog tadpoles were recorded during the assessment (Table 2). Low numbers of two other frog species were heard during the surveys (Table 2). Both of these species are common to the local area, and throughout the majority of Victoria.

Table 2. Results of frog surveys at the study area.

Common Name	Species	Survey site 1*	Survey site 2*
Growling Grass Frog	<i>Litoria raniformis</i>	0	0
Striped Marsh Frog	<i>Limnodynastes peronii</i>	0	3
Common Eastern Froglet	<i>Crinia signifera</i>	8	12

Discussion

The quality of habitats for frogs at Survey Sites 1 and 2 was poor, no Growling Grass Frogs were detected during the current surveys. These habitats are generally unsuitable for Growling Grass Frogs as they are ephemeral, and are unlikely to retain water for substantial durations during the breeding season.

There are myriad records of Growling Grass Frog within the vicinity of the study area, along Merri Creek, however, none have been observed within the study area itself.

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Surveys were undertaken on nights that are suitable for the detection of the frog, being mild to warm nights, in early summer, when Growling Grass Frogs are at their most vocal and most easily observed. Despite this, no Growling Grass Frogs were recorded and the number of other frog species recorded during this assessment was relatively low.

It is concluded, on the basis of the both the desktop assessment and current survey, that it is extremely unlikely that Growling Grass Frogs occur within the areas designated for development within the study area, and no specific mitigation measures are made in relation to this species. Growling Grass Frogs would therefore not preclude the proposed development and this report should be provide to DCCEEW in support of the current referral and approval process.

I trust the above is clear, but please call me if you have any queries (Mobile phone no: 0460 897 443).

Kind regards,

A handwritten signature in black ink, appearing to read 'Liam McCormack'.

Liam McCormack
Botanist/Ecologist
Ecolink Consulting Pty Ltd

References

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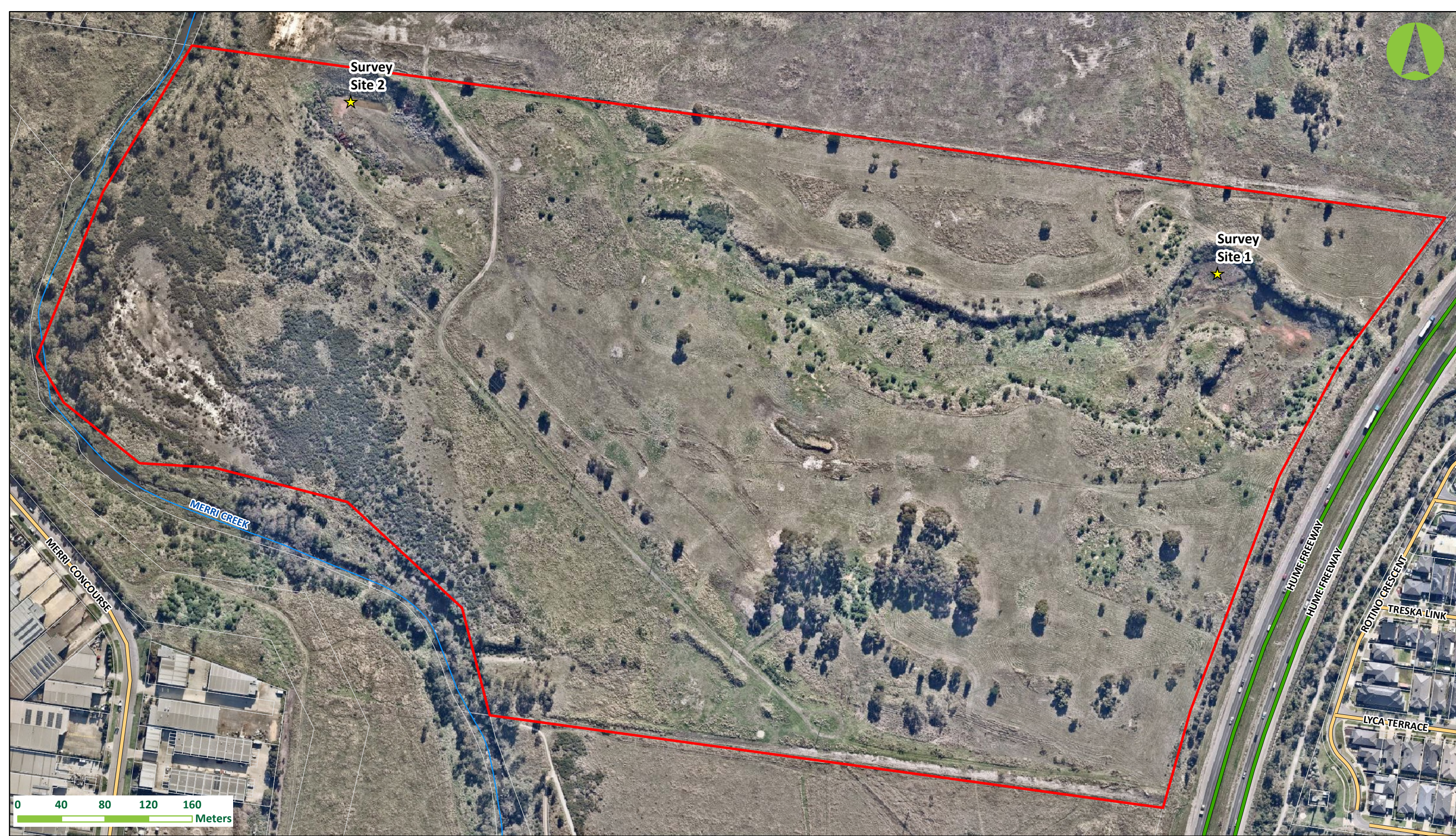


Figure 1: Growling Grass Frog Survey Locations
 485 Cooper Street, Epping, Victoria

- Legend**
- Study Area
 - ★ Survey Site Locations



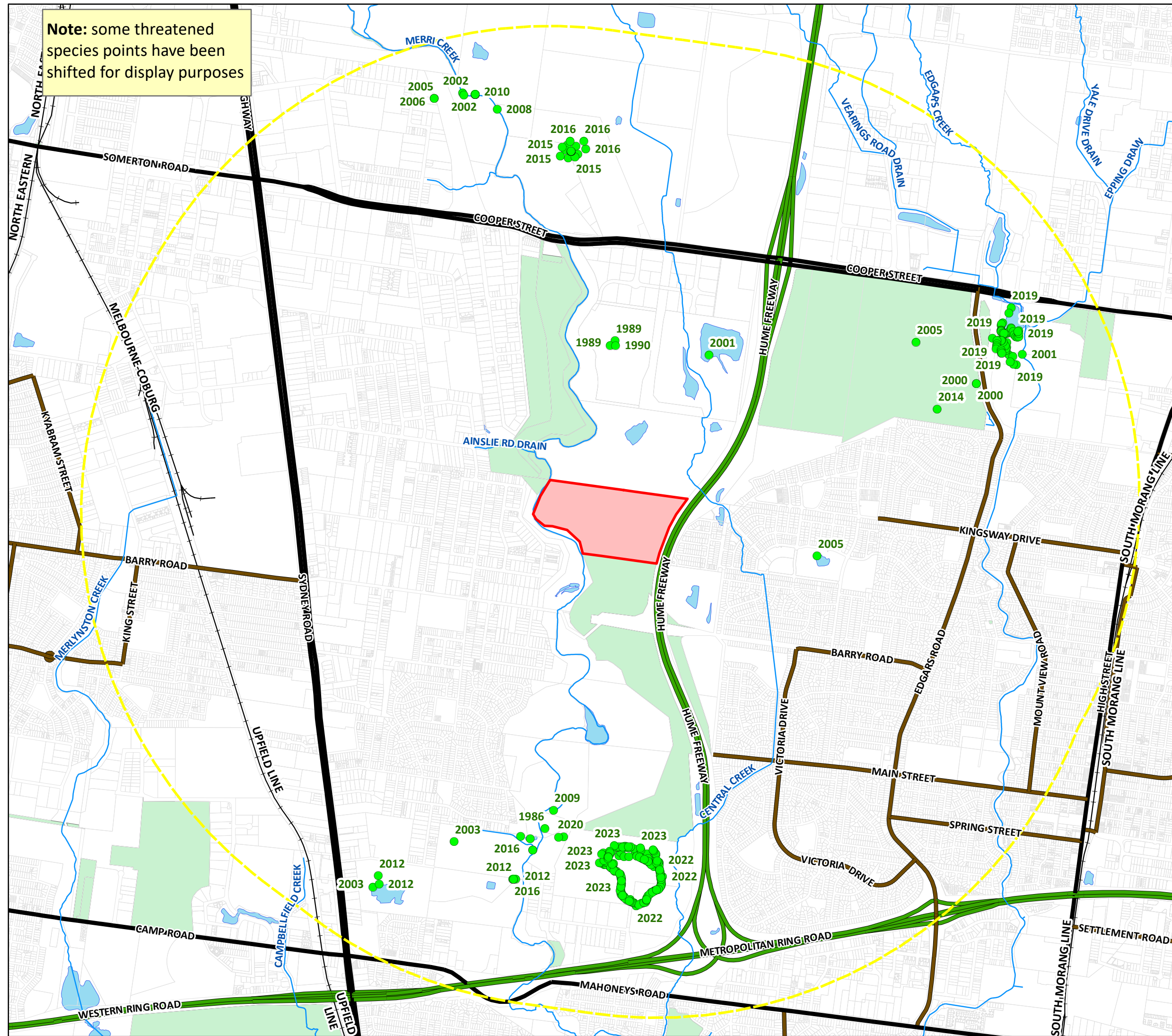
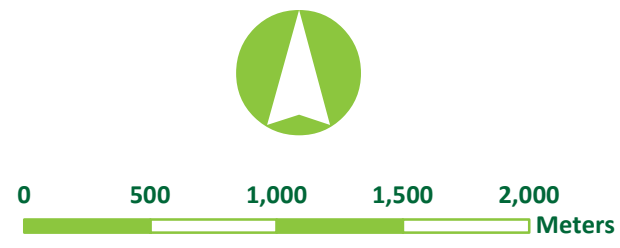
Figure 2. Historic Records of Growling Grass Frog within 3kms of the Study Area

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Legend

- Study Area
- 3km Study Area Buffer
- Growling Grass Frog Observations
- Public Land

Note: some threatened species points have been shifted for display purposes



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Appendix 1. Habitat variables measured to determine the suitability of dams at the study area.

Dam	Variable measured	Survey Site 1	Survey Site 2
Description	Approx. size	150 m ²	21 m ²
	Type of waterbody	Moist depression	Small pond
	Water level %	None	40
Aquatic vegetation	Floating vegetation %	None	None
	Submerged vegetation %	None	3
	Emergent vegetation %	None	8
	Fringing vegetation %	40	20
	Terrestrial vegetation %	50	3
	Terrestrial refuge sites (% cover)	20	5
Water chemistry	Dissolved oxygen (mg/L)	No water	2.6
	Electrical conductivity (mS/cm)	No water	2.32
	pH	No water	9.41
	Turbidity (FTU)	No water	30
	Temperature (°C)	No water	23.8
	Salinity (ppt)	No water	0.11
Predators	Aquatic	No	No
	Terrestrial	Yes	Yes