Targeted fauna surveys at Beaconsfield Reservoir

Waterbirds, Growling Grass Frog, Southern Toadlet and Swamp Skink

D. Bryant, D. Purdey and G.W. Brown

May 2022

Arthur Rylah Institute for Environmental Research
Unpublished Client Report for Melbourne Water

Arthur Rylah Institute for environmental research

VICTORIA State Government | Environment, Land, Water and Planning

Acknowledgement

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.

Arthur Rylah Institute for Environmental Research
Department of Environment, Land, Water and Planning
PO Box 137
Heidelberg, Victoria 3084
Phone (03) 9450 8600
Website: www.ari.vic.gov.au

Citation: Bryant, D., Purdey, D. and Brown, G.W. (2022). Targeted fauna surveys at Beaconsfield Reservoir: Waterbirds, Growling Grass Frog, Southern Toadlet and Swamp Skink. Unpublished Client Report for Melbourne Water. Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

Front cover photos. Main: Beaconsfield Reservoir (Phoebe Macak), Insets (top to bottom): Little Pied Cormorant (Nevil Amos), Growling Grass Frog (Geoff Heard), Swamp Skink (Nick Clemann), Southern Toadlet (Katie Howard).

Acknowledgements

We thank Fin Adamson and Sian Conn (both Melbourne Water), who commissioned this project and served as the principal contact for project staff, respectively.

We also thank Meghan Lindsay (Cardinia Environment Coalition) who facilitated access to the Beaconsfield Nature Conservation Reserve.

Louise Durkin, Lachlan Francis and Peter Griffioen (all Arthur Rylah Institute for Environmental Research) contributed to this project through the collation, analysis and (part) validation of the frog call data.

Phoebe Macak (Arthur Rylah Institute for Environmental Research) provided valuable comments on a draft of this report.

These surveys were performed under ARI's *National Parks Act* 1975 and *Flora and Fauna Guarantee Act* 1988 Research Permit (Permit No.10008640), and ARI's Animal Ethics Permit for Surveys of Victorian Terrestrial Wildlife using Observational and Catch-and-Release Techniques (Permit No. 19-003).

Contents

Acknowledgements ii
Summary 1
1 Introduction 2
2 Methods 3
2.1 Field surveys of waterbirds and select herpetofauna 3
2.1.1 Study Area 3
2.1.2 Waterbirds 3
2.1.3 Growling Grass Frog 4
2.1.4 Swamp Skink 6
2.1.5 Southern Toadlet 6
3 Results 8
3.1 Waterbirds 8
3.2 Swamp Skink 9
3.3 Growling Grass Frog 9
3.4 Southern Toadlet 9
4 Discussion 11
4.1 Waterbirds 11
4.2 Growling Grass Frog 11
4.3 Swamp Skink 11
4.4 Southern Toadlet 12
References 13
Appendix 1 14

Summary

Context: This work addresses a recommendation from a desktop assessment (Shelley et al. 2021) of the expected impact on resident flora and fauna of the proposed lowering of the Beaconsfield Reservoir water level. The principal recommendation of the desktop assessment was to conduct targeted surveys of waterbirds and select herpetofaunal species of significance to determine their presence or the likelihood of their presence at the Beaconsfield Reservoir location. Melbourne Water committed to assessing the potential occurrence of the target herpetofaunal species at the Beaconsfield Reservoir site, despite the lack of records of those target species there.

Aims: To conduct targeted surveys for waterbirds, Growling Grass Frog *Litoria raniformis*, Southern Toadlet *Pseudophryne semimarmorata* and Swamp Skink *Lissolepis coventryi* to determine their presence and prospects of them occurring at Beaconsfield Reservoir.

Methods: Surveys incorporated a mix of on-site and remote data collection. Observational surveys were conducted for waterbirds and Swamp Skink, remote cameras were employed to survey Swamp Skink, acoustic recorders were utilised to survey Growling Grass Frog, and nocturnal surveys were performed for the Growling Grass Frog and Southern Toadlet.

Results: Aside from waterbirds, no target species were detected as part of these surveys. Fifteen species of waterbirds were detected across all surveys, none listed as being of conservation concern. Non-target fauna species recorded during these surveys included at least nine mammal species. Three frog species were recorded during nocturnal spotlight surveys and potentially eight species overall recorded on acoustic recorders, although only possible calls of the Growling Grass Frog were validated.

Conclusions: These targeted surveys addressed a limitation of the broader impact assessment of lowering the water level of Beaconsfield Reservoir, that being the paucity of vertebrate fauna survey data from the Reservoir location. It is likely that there are no populations of the target species currently at the site. It is also likely that lowering the water level as planned will not adversely affect the resident fauna.

1 Introduction

Melbourne Water proposes to reduce the carrying capacity of Beaconsfield Reservoir which will result in an overall reduction of waterbody size and depth (Shelley et al. 2021). The proposed activities would reduce the coverage of shallow water depths (< 1.5 m) from 18,500 to 11,300 m^2, although shallow water will account for a higher proportion of the proposed reservoir. The Reservoir lies within the Beaconsfield Nature Conservation Reserve (BNCR), which harbours flora and fauna that are, to varying degrees, reliant on the habitat provided by the waterbody. As such, Melbourne Water engaged the Arthur Rylah Institute for Environmental Research and Dellbotany to assess potential environmental impacts of the proposed activities on these communities (Shelley et al. 2021). This desktop assessment included recommendations relating to the impact of the proposed reduction in water-holding capacity.

One key recommendation was the targeted survey of waterbirds and select herpetofaunal species of significance, to help inform an evaluation of the presence – or likely presence – of these species in the BNCR. The targeted herpetofaunal species were Growling Grass Frog (GGF) *Litoria raniformis*, Southern Toadlet *Pseudophryne semimarmorata* and Swamp Skink *Lissolepis coventryi*. In response to this recommendation Melbourne Water engaged the Arthur Rylah Institute for Environmental Research to conduct surveys within the BNCR for these taxa, the results of which are reported here. Comments are also provided on the potential impacts on the target taxa of the reservoir drawdown.

2 Methods

2.1 Field surveys of waterbirds and select herpetofauna

2.1.1 Study Area

Beaconsfield Reservoir is in the upper catchment of Haunted Gully Creek within Beaconsfield Nature Conservation Reserve, in the suburb of Officer approximately 45 km southeast of Melbourne (Fig. 1). A history of the Reservoir can be found in Shelley et al. (2021). Ecological Vegetation Classes (EVC's) surrounding the reservoir are dominated by a fringe of Aquatic Sedgeland, dominated by Tall Spike-sedge, within a broader band of Lowland Forest/Grassy Forest. Two shallow arms of the Reservoir support a more complex mosaic of EVC's, typically comprising Aquatic Sedgeland, Aquatic Herbland, Riparian Scrub and Swampy Riparian Woodland (Figs. 2, 3).

2.1.2 Waterbirds

Diurnal surveys for waterbirds were undertaken across the extent of the reservoir using binoculars and spotting scope with species observed and abundances recorded (Fig. 4). Three surveys were undertaken on separate occasions to increase the detection of transient species as well as provide a greater temporal spread of survey effort. A full circumnavigation of the Reservoir was made during each survey and encompassed observations opportunistically from locations that provided a clear view of open water, fringing vegetation and trees surrounding the Reservoir. This amounted to a comprehensive survey of the entire waterbody. Surveys were conducted on the following dates: 13th December 2021, 20th January 2022, and 12th April 2022.

For the purposes of this report, the definition of waterbirds follows Maher (1991), as being species that are dependent on free-standing water for feeding (by swimming, diving or wading), or for the provision of nest sites.

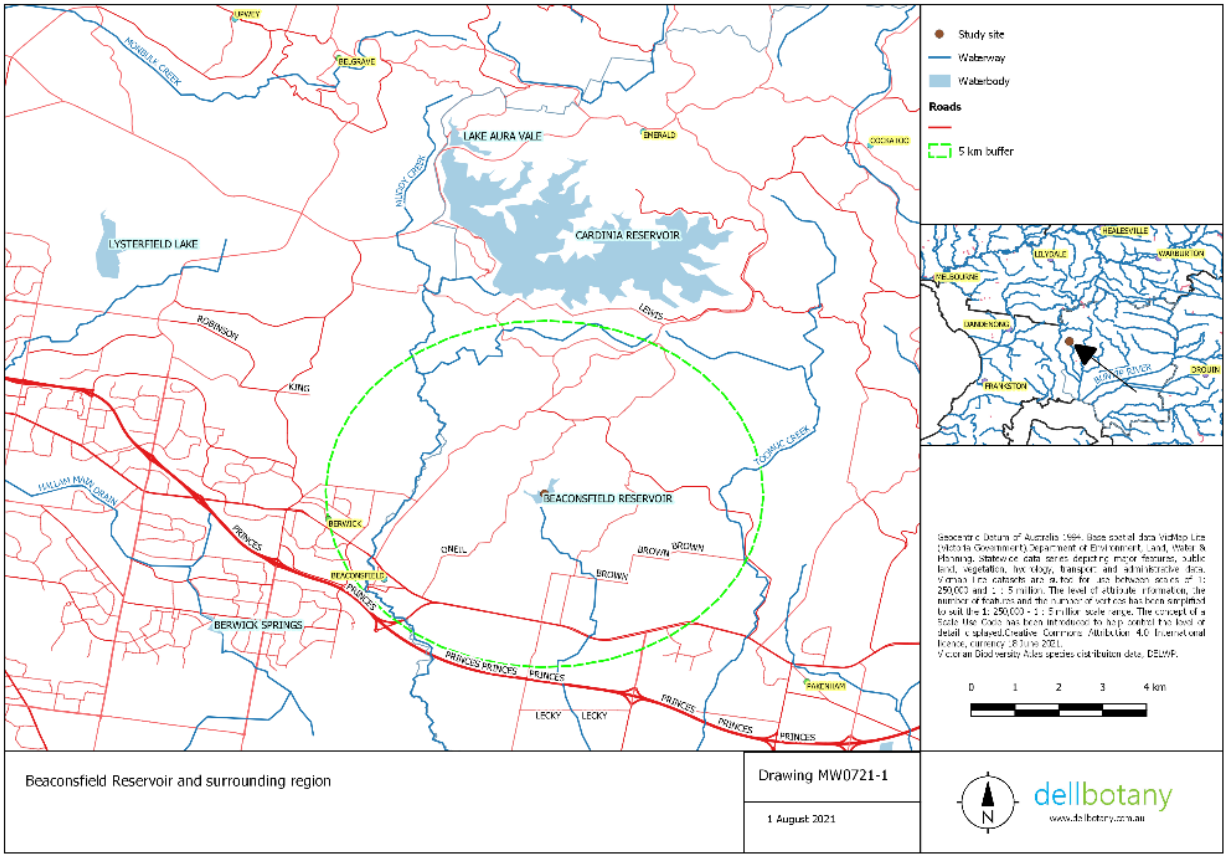

Figure 1. Beaconsfield Reservoir and the surrounding area (from Shelley et al. 2021).

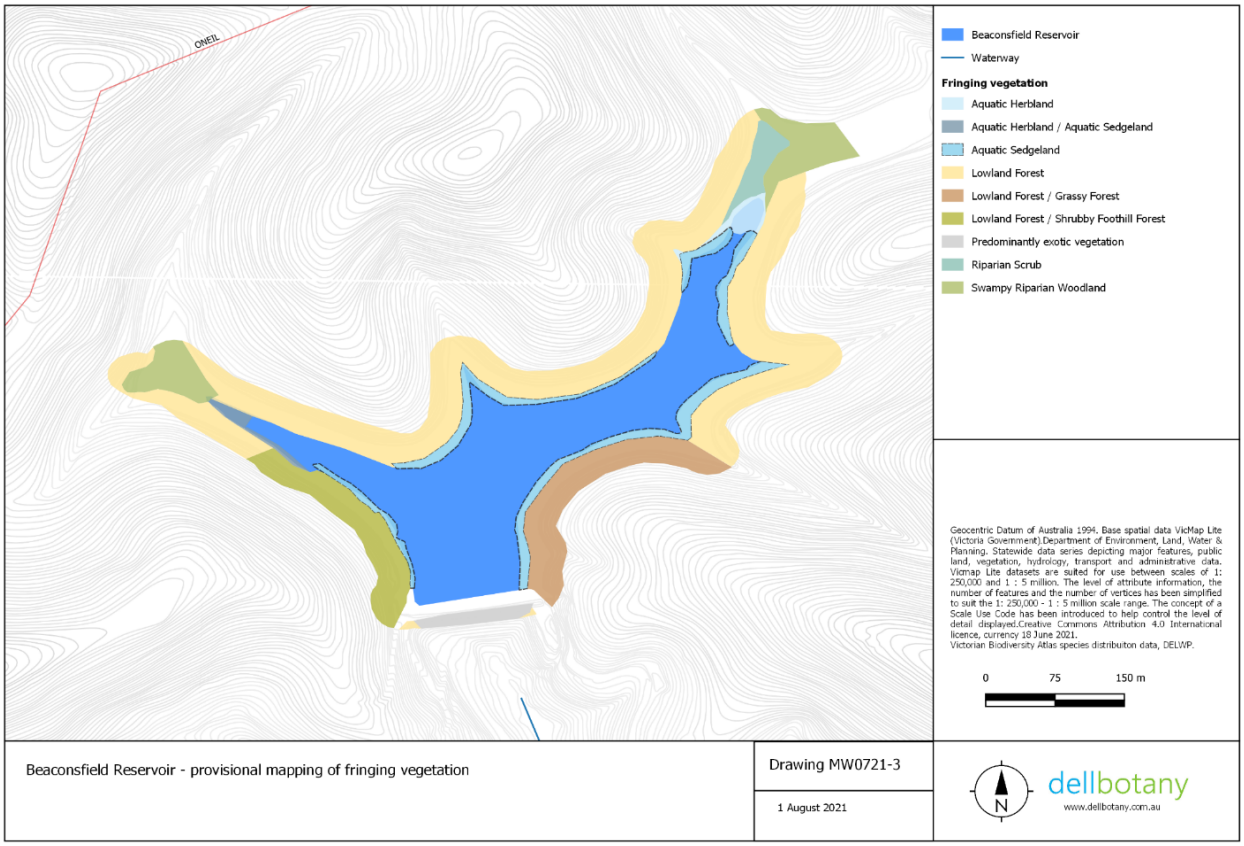

Figure 2. Ecological Vegetation Classes around Beaconsfield Reservoir (from Shelley et al. 2021).

2.1.3 Growling Grass Frog

An acoustic survey for Growling Grass Frog was carried out using AudioMoth acoustic recorders (https://www.openacousticdevices.info/AudioMoth). This survey type was chosen as these acoustic recorders can remain in situ over an extended period, maximising the chance of detecting this species, which has a relatively loud and distinctive call.

Acoustic recorders were deployed at eight locations (Figs. 5, 6) characterised by shallow areas with submerged vegetation (Aquatic Herbland) and Tall Spike-sedge fringe (Aquatic Sedgeland) (Fig. 2). Acoustic recorders, programmed to record for five minutes every hour over 9 hours, were installed on December 13th, 2021, and retrieved on January 20th, 2022.

Recordings, saved as .wav files, were digitally scanned for Growling Grass Frog calls using AI software recently developed by ARI. A subset of spectrograms was also scanned visually; any potential calls observed were listened to using headphones as a secondary check.

Spotlight surveys for GGF were conducted at the two shallow arms of the Reservoir with submerged vegetation. Each survey involved two observers scanning the surface water, water's edge and bank with torches (Klarus LED), looking for eyeshine and direct observation of frogs.

Figure 3. Examples of the dominant aquatic vegetated habitats along the perimeter of Beaconsfield Reservoir, A) Tall Spike-sedge fringe, and B) shallow water with submerged aquatic vegetation.

Figure 4. Undertaking waterbird survey using spotting scope (inset).

Figure 5. Locations of nocturnal GGF and Southern Toadlet surveys, Beaconsfield Reservoir.

2.1.4 Swamp Skink

Remote cameras and active searches were employed to survey the Swamp Skink at Beaconsfield Reservoir (Fig. 7). Two areas of potentially suitable habitat were targeted, both associated with Aquatic Sedgeland/Riparian Scrub and Swampy Riparian Woodland vegetation (Fig. 2). Ten remote cameras (Reconyx HP2X) were deployed and left in-situ from December 13th, 2021, to January 20th, 2022. Exposed sites with high daytime temperatures led to some cameras not operating for the entire deployment. Cameras operated for a minimum of 15 days and a maximum of 38 days (Appendix 1). All images captured were downloaded and visually scanned to identify all taxa photographed.

Active searches were performed on two occasions at the two shallow arms of the reservoir, in the same area as and coinciding with camera deployment and pickup. A single observer scanned areas of suitable habitat by eye, assisted with binoculars where necessary, looking for Swamp Skink. A total of 3 hours was spent performing active searches. Opportunistic searches were also undertaken during bird surveys.

2.1.5 Southern Toadlet

On-site surveys were employed in preference to acoustic recorders as the soft call of this species is not readily detected using acoustic recorders. Nocturnal surveys were undertaken for the Southern Toadlet at locations within the BNCR with suitable habitat for this species (gullies, road culverts, depressions etc), and simultaneously with surveys for GGF. Three surveys were carried out during the calling period for this species, late summer to early winter. Surveys at each site involved a listening period of 5 minutes, followed by an active search with torches for calling males.

The timing of surveys and weather conditions are important considerations for maximising the detection of this species. Ideal conditions are after rain events when temperatures are warm to mild and every attempt was made to perform surveys under these conditions.

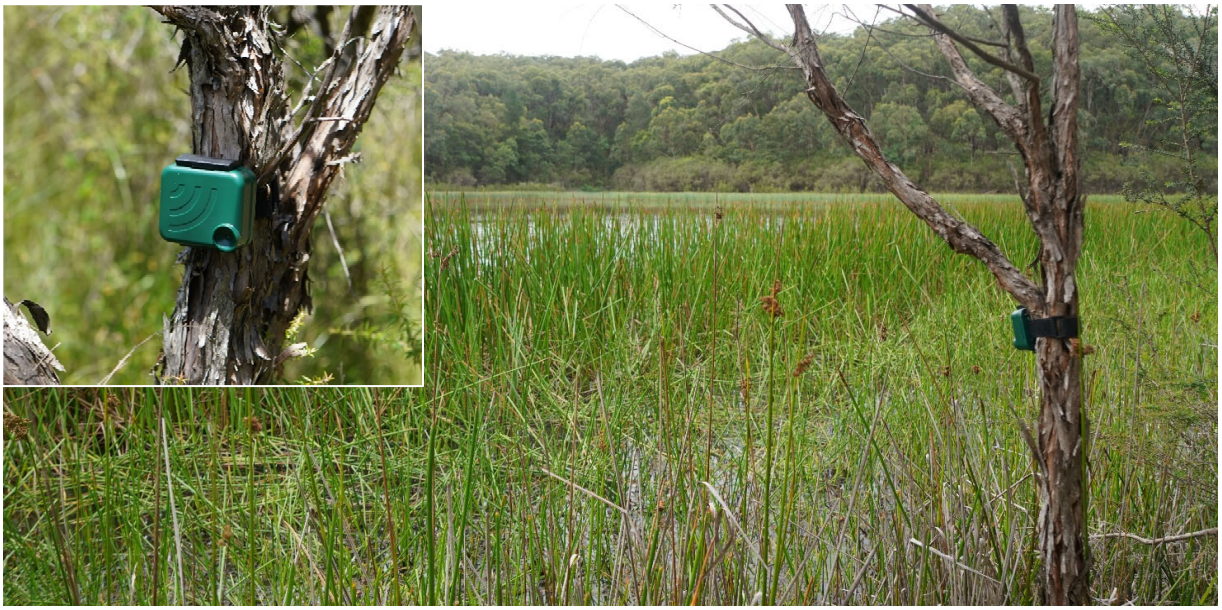

Figure 6. **AudioMoth acoustic recorder deployed in-situ targeting Tall Spike-sedge habitat; close-up of AudioMoth (inset).**

Figure 7. **Reconyx HP2X cameras deployed across examples of different habitat types. A) Aquatic Sedgeland/Riparian Scrub; B) Swampy Riparian Woodland.**

3 Results

3.1 Waterbirds

Fifteen waterbird species were recorded during three separate surveys (Table 1). Two additional species (Australian Shelduck *Tadorna tadornoides* (2 individuals), Hoary-headed Grebes *Poliocephalus poliocephalus* (3)) were observed on a reconnaissance visit prior to visits to conduct standardised surveys.

Some evidence of breeding at the Reservoir was recorded: one juvenile Dusky Moorhen *Gallinula tenebrosa* and seven juvenile Eurasian Coot *Fulica atra*, all too young to have flown from elsewhere. Species were recorded on open water, in fringing emergent vegetation, perching in surrounding trees or flying overhead. A Buff-banded Rail *Hypotaenidia philippensis* was seen on open water, traversing the Reservoir.

Table 1. Waterbird species recorded from Beaconsfield Reservoir during ARI surveys, December 2021, January and April 2022.

Incidental observations of taxa are also included.

Common Name	Scientific Name	Survey			Evidence of breeding	Incidental
		1	2	3		
Australasian Darter	*Anhinga novaehollandiae*	4	3			
Australasian Swamphen	*Porphyrio melanotus*	2	1			
Australian Reed Warbler	*Acrocephalus australis*	1				
Australian Shelduck	*Tadorna tadornoides*					2
Australian Wood Duck	*Chenonetta jubata*	2				
Buff-banded Rail	*Hypotaenidia philippensis*		1			
Dusky Moorhen	*Gallinula tenebrosa*	2			yes	
Eurasian Coot	*Fulica atra*		11		yes	
Great Cormorant	*Phalacrocorax carbo*	1				
Hoary-headed Grebe	*Poliocephalus poliocephalus*			4		3
Little Black Cormorant	*Phalacrocorax sulcirostris*		1			
Little Pied Cormorant	*Microcarbo melanoleucos*		1			
Pacific Black Duck	*Anas superciliosa*	5	5			
Sacred Kingfisher	*Todiramphus sanctus*	1	1			
White-faced Heron	*Egretta novaehollandiae*	2				

3.2 Swamp Skink

No images of the Swamp Skink were captured on any of the ten cameras deployed as part of these surveys. Non-target detections included twelve bird and at least nine mammal species (Table 2).

The Swamp Skink was not observed during active searches for this species or as incidental observations during bird surveys. Other, smaller skinks (not Swamp Skink) were observed through binoculars on several occasions but could not be identified to species.

3.3 Growling Grass Frog

AudioMoth recordings and AI analysis yielded 93 predictions of GGF and, given the project objective and the constraints mentioned below, were the only calls to undergo validation. All were false positives, so no confirmed GGF calls were collected during acoustic monitoring.

Potentially, six non-target frog species were detected on the AudioMoth recordings, namely Southern Brown Tree Frog *Litoria ewingii*, Pobblebonk *Limnodynastes dumerilii*, Barking Marsh Frog *L. fletcheri*, Spotted Marsh Frog *L. tasmaniensis*, Common Froglet *Crinia signifera* and Victorian Smooth Froglet *Geocrinia victoriana*. However, given the time constraints and the ongoing development of the AI model and call library for identifying frog calls, the calls of these potential resident species were not validated and thus remain unconfirmed from our AudioMoth recordings.

Growling Grass Frog calls were not detected during nocturnal spotlight surveys, although surveys for the Growling Grass Frog and the Southern Toadlet yielded several frog species: Common Froglet (northern and south-western arms, dam wall), Victorian Smooth Froglet *Geocrinia victoriana* (northern and south-western arms), and Southern Brown Tree Frog *Litoria ewingii* (northern arm).

3.4 Southern Toadlet

Despite efforts to conduct nocturnal surveys for the Southern Toadlet under ideal weather conditions — after rain when temperatures are warm to mild — to maximise detection of the frog, this was not achieved. The Southern Toadlet was not detected during this project.

Table 2. Vertebrate taxa recorded on camera as part of the Swamp Skink surveys at Beaconsfield Reservoir.

Survey dates are presented in Appendix 1.

+ denotes taxa recorded on camera; * denotes introduced taxa

Taxa recorded		Camera #									
Common name	**Scientific name**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Birds											
Brown Thornbill	*Acanthiza pusilla*		+								
Pacific Black Duck	*Anas superciliosa*			+				+			
Grey Shrike-thrush	*Colluricincla harmonica*								+	+	+
White-faced Heron	*Egretta novaehollandiae*			+				+			
Eastern Yellow Robin	*Eopsaltria australis*	+	+			+			+		
Eurasian Coot	*Fulica atra*			+							
Dusky Moorhen	*Gallinula tenebrosa*			+	+		+	+			
Superb Fairy-wren	*Malurus cyaneus*		+		+	+	+	+		+	+
White-eared Honeyeater	*Nesoptilotis leucotis*				+						
Australasian Swamphen	*Porphyrio melanotus*					+		+		+	+
White-browed Scrubwren	*Sericornis frontalis*		+						+		
Common Blackbird*	*Turdus merula*		+						+		
Mammals											
Eastern Grey Kangaroo	*Macropus giganteus*		+							+	
Bush Rat	*Rattus fuscipes*	+	+						+		
Rat unidentified	*Rattus* sp.				+						
Short-beaked Echidna	*Tachyglossus aculeatus*		+		+				+	+	+
Common Wombat	*Vombatus ursinus*	+	+	+	+	+	+		+	+	+
Back-tailed Wallaby	*Wallabia bicolor*	+	+						+	+	+
Fallow Deer*	*Cervus dama*		+			+			+		
Deer unidentified*	*Cervus* sp										+
Sambar Deer*	*Cervus unicolor*	+		+	+	+					
Black Rat*	*Rattus rattus*										+
Red Fox*	*Vulpes vulpes*		+			+			+	+	+

4 Discussion

This work was limited to targeted surveys for three herpetofaunal species listed as being of conservation concern, and the broader grouping of waterbirds. Likely impacts of lowering the water-level of the Beaconsfield Reservoir on the habitat of these taxa are discussed in Shelley et al. (2021), and some notes on this are presented below. The purpose of the targeted surveys was to determine the presence – or likely presence – of these taxa and the assess the likely impacts on them of lowering the water level of the reservoir.

While the surveys did not detect Growling Grass Frog, Swamp Skink, or Southern Toadlet, it does not exclude the possibility that any of these species occur on site, either permanently or transiently. The targeted surveys were performed in part due to a lack of records for fauna species within the Beaconsfield NCR, likely a result of the area having restricted access to the public. While not discounting the presence of the select taxa, it can now be said that, based on recent surveys, there are no known populations of these taxa at the site.

4.1 Waterbirds

No officially listed threatened species were recorded during the three waterbird surveys.

The planned gradual draw down of the reservoir is likely to have little impact on those waterbird species found to be using the wetland. All recorded species are common and widespread and were observed in relatively low numbers.

Some evidence of breeding at the Reservoir was recorded. A reduction of the water-level may increase the area of shallow water and as vegetation establishes across the lower water fringe, similar and possibly expanded favourable habitat may be available to those waterbird species that utilise such habitat (e.g. Australasian Swamphen, Australian Reed Warbler, Buff-banded Rail).

The planned works on the dam wall are unlikely to present long-term detrimental effects on waterbird populations in the Reservoir. Noise pollution is considered to be of greatest concern and undoubtedly will be a deterrent to some species, particularly at the south end of the Reservoir. However, this is likely to present a temporary impact until the works are completed.

4.2 Growling Grass Frog

This species is highly mobile, often existing as meta-populations where multiple sites across a broad area are occupied by a population, with occupancy of individual sites changing over time. Consequently, it is a species that may only be recorded infrequently at any given site. Its distinctive call, large size and ability to utilise constructed water bodies, such as farm dams and household ponds, is likely to increase the chances of its detection in an area. The absence of detections from our surveys as well as an absence of records from the immediate surrounds of the Reservoir suggests that the Beaconsfield Reservoir is not occupied, or not occupied regularly, by this species.

In relation to the drawdown of Beaconsfield Reservoir, GGF tadpoles require complex habitat that can afford protection from predatory fish species, with aquatic vegetation often providing this habitat. At Beaconsfield Reservoir the vegetation within the two shallow arms of the reservoir appears to provide the greatest complexity of habitat. This vegetation is likely to establish in any shallow areas created by the drawdown and provide ongoing habitat for GGF onsite. There is less complexity in vegetation near the dam wall, but the rock outer skin of the wall does offer sites for adults to shelter.

4.3 Swamp Skink

The Swamp Skink inhabits swampy environments, even some areas subject to inundation (Robertson and Coventry 2019). The shallower arms of the Reservoir, as targeted for Growling Grass Frog, were also targeted for Swamp Skink due to these being the wetter terrestrial areas around the Reservoir. Disturbance from deer in the form of trampling, pugging and wallows was clearly visible in these areas. These moist areas appear isolated in the broader landscape of the BNCR; whether these swampy areas occurred prior to the construction of the Reservoir is unknown, but if not, may explain the species' likely absence.

4.4 Southern Toadlet

The only record of Southern Toadlet within BNCR was collected in 1981 approximately 400 m to the north of the northern arm of Beaconsfield Reservoir (Victorian Biodiversity Atlas, DELWP). Combined with a lack of detections during our surveys, it appears that the Southern Toadlet is not common at Beaconsfield Reservoir. However, care must be taken with this interpretation as a lack of survey effort can account for low numbers of records. The detection of these Toadlets at sites that have few individuals (e.g. Lysterfield Park) has required surveyors to be within 20 m of calling individuals in order to have confidence in detection (C. Cleeland unpubl. data). Combined with extremely small home ranges, limited to 5 m from the breeding site (SWIFFT website, https://www.swifft.net.au/cb_pages/sp_southern_toadlet.php, accessed 8/4/2022), there is little confidence in declaring the Toadlet's absence from the BNCR.

The impact on this species of drawing down Beaconsfield Reservoir, were they to occur in the BNCR, will likely depend on the resulting topography. The Southern Toadlet commonly inhabits leaf litter in damp places (Tyler and Knight 2009) and so would be expected to occupy drainage-lines leading into the Reservoir. Eggs are laid in moist areas or depressions with large rain events releasing tadpoles into larger waterbodies by flooding of the nest. We consider it unlikely that works in the immediate vicinity of the dam wall will affect this species.

References

Humphrey, J.E., Robert K.A., Leonard S.WJ. (2017). Elliott traps found to be ineffective for the survey of swamp skink (*Lissolepis coventryi*): a cautionary tale of outdated survey guidelines. *Wildlife Research* 44(6–7): 514-522.

Maher, M. (1991). Waterbirds back o' Bourke: an inland perspective on the conservation of Australian waterbirds. PhD Thesis, University of New England.

Robertson, P. and Coventry, A.J. (2019). Reptiles of Victoria. A Guide to Identification and Ecology. CSIRO Publishing, Clayton South, Victoria.

Shelley, J.J., Dell, M., Howard, K.M., Macak, P.V. and Brown, G.W. (2021). Lowering the water level of Beaconsfield Reservoir: A desktop assessment of environmental values and potential impacts. Unpublished Client Report for Melbourne Water. Arthur Rylah Institute for Environmental Research, Department of Environment, Land, Water and Planning, Heidelberg, Victoria.

Tyler, M.J. and Knight, F. (2009). Field guide to the frogs of Australia. CSIRO publishing, Collingwood, Victoria, Australia.

Appendix 1

AudioMoth and camera trap location and deployment details.

Target taxa	Survey/ equipment	Location		Dates		Time
AudioMoth	Unit #	Latitude	Longitude	Date deployed	Date last operating	No. days operating
Growling Grass Frog	1	-38.0265	145.406	14/12/2021	20/01/2022	38
	2	-38.0265	145.4058	14/12/2021	20/01/2022	38
	3	-38.0248	145.4120	14/12/2021	20/01/2022	38
	4	-38.0241	145.4128	14/12/2021	20/01/2022	38
	5	-38.0248	145.4130	14/12/2021	20/01/2022	38
	6	-38.0254	145.4126	14/12/2021	20/01/2022	38
	7	-38.0280	145.4103	14/12/2021	20/01/2022	38
	8	-38.0287	145.4102	14/12/2021	20/01/2022	38
Camera	Unit #	Latitude	Longitude	Date deployed	Date last operating	No. days operating
Swamp Skink	1	-38.0232	145.413	14/12/2021	20/01/2022	38
	2	-38.0231	145.4131	14/12/2021	20/01/2022	38
	3	-38.0241	145.4130	14/12/2021	30/12/2021	17
	4	-38.0241	145.4128	14/12/2021	20/01/2022	38
	5	-38.0243	145.412	14/12/2021	19/01/2022	37
	6	-38.0243	145.4127	14/12/2021	31/12/2021	18
	7	-38.0241	145.4123	14/12/2021	28/12/2021	15
	8	-38.0238	145.4129	14/12/2021	20/01/2022	38
	9	-38.0266	145.4059	14/12/2021	20/01/2022	38
	10	-38.0266	145.4061	14/12/2021	20/01/2022	38
Active searches	Search #	Search area		Search date		Hours
Swamp Skink	1	Northern and south-western arms		14/12/2021		2:00
	2	Northern and south-western arms		20/1/2022		1:45
Waterbirds	1	Whole of reservoir		14/12/2021		4:25
	2	Whole of reservoir		20/1/2022		3:08
	3	Whole of reservoir		12/4/2022		3:35
Nocturnal surveys	Search #	Search area		Search date		Hours
Southern Toadlet	1	Primarily northern and south-western arms		12/4/22		2:10
	2	Primarily northern and south-western arms		3/5/22		2:20
	3	Primarily northern and south-western arms		5/5/22		2:00
Growling Grass Frog	1	Northern and south-western arms, dam wall		12/4/22		2:30
	2	Northern and south-western arms, dam wall		3/5/22		2:50
	3	Northern and south-western arms, dam wall		5/5/22		2:20

www.delwp.vic.gov.au

www.ari.vic.gov.au