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**Randwick Environment Park
Frog & Reptile Study
2012 - 2013**

Randwick City Council



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Randwick City Council

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Frog & Reptile Study

Randwick City Council

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EXECUTIVE SUMMARY

Total Earth Care Pty. Ltd was engaged by Randwick City Council to undertake a frog and reptile survey of Randwick Environment Park (REP) from November 2012 to February 2013.

Frog and reptile species were targeted through the use of diurnal and nocturnal techniques, and survey effort was aligned with favourable climatic conditions for the detection of herpetofauna within the Park.

A total of eight (8) visits were made to the park to survey for the target species and included active diurnal and nocturnal habitat searches, aural call recognition, call playback for threatened species and spotlighting.

Five (5) species of frog from three (3) genera across two (2) families were recorded, along with seven (7) species of reptile from four (4) genera of the family Scincidae. All species are considered relatively common to the habitat supported by the Park and none are expected to range significantly outside REP boundaries.

No species listed as threatened in New South Wales or Federally were recorded during the current investigation.

Frog & Fauna Study Randwick City Council

1 INTRODUCTION

1.1 Project Background

Randwick Environmental Park (REP) (the 'subject site'), is located within what was formerly Department of Defence land known as the Defence Site Bundock Street, Randwick. REP is a 14 hectare park, bounded by Dooligah Avenue and Burragalung Street in the north, residential properties to the east, Joongah Street to the south, and a community centre and public open space to the west.

Randwick City Council engaged Total Earth Care Pty Ltd to undertake a Frog & Reptile Study at REP over spring / summer 2012 - 2013. Works were to include nocturnal surveys targeting frogs and geckos and diurnal surveys for frog tadpoles and reptiles.

Randwick Environment Park supports a range of frog and reptile habitat in the form of a large permanent wetland with ephemeral reaches and associated riparian vegetation, significant areas of sandstone outcropping, a rehabilitated creekline and sizeable areas of native and exotic vegetation.

Vegetation management activities are undertaken with the Park and a resulting recommendation of this study is they continue with a focus on habitat restoration for the herpetofauna that occur with the Park.

1.2 Project Aims

The objectives of the fauna study are to:

- Collect and present frog and reptile species list of the site.
- Assess the habitat types present at REP and their potential to support frog and reptile species including threatened species.
- Assess REP's habitat and biodiversity values and recommend appropriate restoration techniques to improve the Park's ecological assets.

1.3 Scope of Works

The scope as prescribed by Council for the frog and reptile survey included the following:

- Complete a herpetofauna survey within REP which meets all the principle objectives above;
- Compile a species list for the Park which includes, but is not limited to the following:
 - Location;
 - Scientific Name and Common Name;
 - Significant information including listings under State and Commonwealth Legislation;
 - Date of data collection;
 - Person recording;
 - Record type;
 - Behaviour; and
 - Abundance.
- Mapping and description of significant habitat;
- Discussion of the life history strategies of the occurring and potentially occurring species on site; and
- Management recommendations for amphibian and reptile species within REP.

2 METHODS

2.1 Desktop Research

Prior to field survey, existing Council data, reports, reserve plans of management, species profiles for targeted fauna species and populations, species habitat preferences, vegetation community information), and other information for REP were reviewed. A review of fauna records from the wider locality was undertaken using the NSW Wildlife Atlas database. A review was also carried out of the NSW Scientific Committee Final Determinations and other literature for threatened species either known from or predicted to occur in the LGA.

2.2 Field Surveys

2.2.1 Habitat Assessment & General Data Collection

A frog and reptile habitat assessment was undertaken with the following environmental aspects assessed:

- Vegetation structure including density and height of the vegetation layers;
- Leaf litter;
- Rock shelves;
- Soil type;
- Presence of water;
- Man-made habitats;
- Indirect evidence of fauna such as burrows, skins, droppings; and
- Climatic conditions (temperature, wind speed & direction, rainfall, cloud cover, moon phase).

2.2.2 Amphibians

Frog surveys focused on nocturnal techniques, with diurnal searches used as an additional technique to target basking frogs, including Green and Golden Bell Frogs. Diurnal survey effort was undertaken within areas considered suitable habitat; the specific survey time/effort was determined by the size of the habitat present. All watercourses within the Park, and the surrounding habitat, was searched.

Nocturnal surveying involving aural call identification (audio strip transects along creeklines; static call survey near ponds), call playback, and spot lighting was undertaken over four wet nights, and one dry night. Species targeted via call-playback reflected results of NSW Wildlife Atlas searches and include:

- Green and Golden Bell Frog (*Litoria aurea*);
- Red-crowned Toadlet (*Psuedophryne australis*); and
- Giant Burrowing Frog (*Heleioporus australiacus*).

Surveys were undertaken according to environmental conditions outlined in *Field Survey Methods for Native Fauna* (OEH) and *Survey Guidelines for Australia's Threatened Frogs: Guidelines for detecting frogs listed as threatened under the EPBC Act 1999* (DEWHA).

2.2.3 Reptiles

Reptile surveying involved active searching during the day and spotlighting at night. Diurnal searches were conducted mid-morning (when reptiles have not reached their optimal temperature) over three days during hot, dry and calm weather. Potential habitat such as logs, rocks, leaf litter, and rubbish were targeted. Nocturnal spotlighting was used to target geckoes and nocturnal snakes over one night around rock escarpments and other suitable habitat areas.

2.3 Survey Effort

As per the Project Brief the following survey effort was required for the current project;

- Reptile searches: 2 mornings
- Gecko searched: 1 dry night
- Frog searches: 2 wet nights
- Tadpole searches: 1 dry day

The actual survey effort undertaken varied slightly from that outlined above. A period of hot dry weather over December 2012 – January 2013 lead to an assessment being made as to the low likelihood of tadpoles occurring within the wetland vegetation, during the time outlined for survey effort. As a result of which, a decision was made to increase the rest of the survey effort in place of the diurnal tadpole searches. Following this decision additional diurnal reptile searches were conducted, and nocturnal frog surveys were undertaken during / following the eventual heavy rain events in late January 2013.

The following table (Table 1) summarises the survey effort undertaken for the current project.

Table 1 Survey effort detailed for the current study at REP.

Survey Dates	Survey Effort	Survey Methods	Weather
27 th November 2012	Nocturnal Survey	<i>Amphibians</i> - frog aural detection, spotlighting, call playback for <i>Litoria aurea</i> , <i>Heleioporus australiacus</i> and <i>Pseudophryne australis</i> <i>Habitat Assessment</i> – potential habitats for identified threatened species	Night Mild, Raining Temperature 20oC
29 th November 2012	Nocturnal Survey	<i>Reptiles</i> – spotlighting, active habitat searches <i>Habitat Assessment</i> – potential habitats for identified threatened species	Night Warm dry Temperature 29oC
20 th December 2012	Diurnal Survey	<i>Amphibians</i> - frog aural detection, active habitat searches <i>Reptiles</i> – Active habitat searches <i>Habitat Assessment</i> – potential habitats for identified threatened species	Day Hot dry Moderate wind Temperature 33oC
08 th January 2013	Diurnal Survey	<i>Reptiles</i> – active habitat searches <i>Habitat Assessment</i> – potential habitats for identified threatened species	Day Hot dry Temperature 40oC
24 th January 2013	Diurnal Survey	<i>Reptiles</i> – active habitat searches <i>Habitat Assessment</i> – potential habitats for identified threatened species	Day Hot dry Temperature 28oC
29 th January 2013	Nocturnal Survey	<i>Amphibians</i> - frog aural detection, spotlighting call playback for <i>Litoria aurea</i> , <i>Heleioporus australiacus</i> and <i>Pseudophryne australis</i> <i>Habitat Assessment</i> – potential habitats for identified threatened species	Night Mild, Following heavy rain, Lightly raining Temperature 26oC
30 th January 2013	Nocturnal Survey	<i>Amphibians</i> - frog aural detection, spotlighting call playback for <i>Litoria aurea</i> , <i>Habitat Assessment</i> – potential habitats for identified threatened species	Night Mild, Following heavy rain, Temperature 26oC
06 th February 2013	Nocturnal Survey	<i>Amphibians</i> - frog aural detection, spotlighting call playback for <i>Litoria aurea</i> , <i>Habitat Assessment</i> – potential habitats for identified threatened species	Night Mild, Following heavy rain, Raining Temperature 27oC

Survey effort within REP is illustrated on Map 02, Appendix A.

2.4 Limitations

Field surveys were conducted during spring and summer 2012 - 2013. Field surveys were generally consistent with the survey effort recommendations of *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft* (DEC 2004a) with particular reference to the size of the survey site, broad scale vegetation communities and major sampling stratification units. As stated by the DEC (2004a) '*The absence of a species from survey data does not necessarily mean it does not inhabit the survey area. It may simply mean that the species was not detected at that time with the survey method adopted and the prevailing seasonal or climatic conditions.*' Accordingly, the brevity of the survey and its timing mean that the full spectrum of herpetofauna species likely to occur at a reserve cannot be fully quantified or described in this report.

3 RESULTS

3.1 Threatened Species Desktop Search

3.1.1 Threatened Species

A search of the OEH Bionet Wildlife Atlas for records within a 5km radius of the subject site identified seven threatened frog and reptile species with confirmed records, or as "known to occur within the overlapping CMA sub-region". Table 2 outlines the threatened species records.

Table 2 Threatened fauna species previously recorded within the locality (5km radius of the subject site).

General Status		Records
*	Exotic/introduced species	
(?)	Uncertain identification	x - No. of records within 5km radius of the subject site
P	Protected	
U	Unprotected	
Conservation Status		
CE	Critically Endangered - listed under Schedule 1A of the TSC Act	K (Known) - Where there are confirmed records, specimens or otherwise verified sightings within the Pittwater (Part B) CMA Subregion
E	Endangered - listed under Schedule 1 of the TSC Act	
V	Vulnerable - listed under Schedule 2 of the TSC Act	

Status	Group	Family	Scientific Name	Common Name	Records
E	Amphibia	Hylidae	Litoria aurea	Green and Golden Bell Frog	14
V	Amphibia	Hylidae	Litoria brevipalmata	Green-thighed Frog	K
V	Amphibia	Myobatrachidae	Crinia tinnula	Wallum Froglet	K
V	Amphibia	Myobatrachidae	Heleioporus australiacus	Giant Burrowing Frog	K
V	Amphibia	Myobatrachidae	Pseudophryne australis	Red-crowned Toadlet	K
E	Reptilia	Elapidae	Hoplocephalus bungaroides	Broad-headed Snake	K
V	Reptilia	Varanidae	Varanus rosenbergi	Rosenberg's Goanna	K

3.2 Field Survey Results

The following table (Table 3) outlines those species recorded during field survey works at Randwick Environmental Park between November 2012 and February 2013.

Table 3 Herpetofauna species recorded within REP during the current study.

General Status		Record Type			
*	Exotic/introduced species	O Observed	K Dead	* Pers Comm: TEC Bush Regen crew members	
(?)	Uncertain identification	W Heard call	R Road kill		
P	Protected	T Trapped or netted	D Dog kill		
U	Unprotected	S Skin	C Cat kill		
		X In scat	V Fox kill		
Conservation Status		Observer	Abundance		
CE	Critically Endangered - listed under Schedule 1A of the TSC Act	LL - Lachlan Laurie	C Common	O Occasional	
E	Endangered - listed under Schedule 1 of the TSC Act	CW - Callan Wharfe	Uc Uncommon		
V	Vulnerable - listed under Schedule 2 of the TSC Act	RM - Rachel Musgrave			

Status	Group	Family	Scientific Name	Common Name	Obs Type	Date & Time	Observer	Behaviour	Abundance
P	Amphibia	Hylidae	<i>Litoria dentata</i>	Bleating Tree Frog	W	27.11.12	LL, CW	Calling	Uc
P	Amphibia	Hylidae	<i>Litoria fallax</i>	Eastern Dwarf Tree Frog	W/O	29.01.13	RM, CW	Calling / Migrating	O
P	Amphibia	Hylidae	<i>Litoria peronii</i>	Peron's Tree Frog	W/O	27.11.12	LL, CW	Calling / Migrating	C
P	Amphibia	Myobatrachidae	<i>Crinia signifera</i>	Common Eastern Froglet	W	27.11.12	LL, CW	Calling	C
P	Amphibia	Myobatrachidae	<i>Limnodynastes peronii</i>	Brown-striped Frog	W/O	27.11.12	LL, CW	Calling / Migrating	C
P	Reptilia	Scincidae	<i>Acritoscincus platynota</i>	Red-throated Skink	O	08.01.13	RM, CW	Basking	O
P	Reptilia	Scincidae	<i>Cryptoblepharus virgatus</i>	Cream-striped Shining-skink	O	20.12.12	RM, CW	Hunting	C
P	Reptilia	Scincidae	<i>Ctenotus taeniatus</i>	Copper-tailed Skink	O	20.12.12	RM, CW	Basking	Uc
P	Reptilia	Scincidae	<i>Lampropholis delicata</i>	Dark-flecked Garden Sunskink	O	08.01.13	RM, CW	Hunting	C
P	Reptilia	Scincidae	<i>Lampropholis guichenoti</i>	Pale-flecked Garden Sunskink	O	20.12.12	RM, CW	Basking	O
P	Reptilia	Scincidae	<i>Tiliqua scincoides</i>	Eastern Blue-tongue	O	08.01.13	RM, CW	Basking	O
P	Reptilia	Elapidae	<i>Hemiaspis signata</i>	Black-bellied Swamp Snake	*				

4 HABITAT VALUE OF RANDWICK ENVIRONMENTAL PARK

4.1 Significant Habitat Features

Randwick Environment Park supports a variety of habitat types utilised by herpetofauna derived from both natural and made-made/reconstructed environmental features. The table below (Table 4) summarises these microhabitats and their various values to the Park's frogs and reptiles. A map outline the locations of these habitat types within REP is attached below as Map 01, Appendix A.

Table 4 Habitat types present within REP.

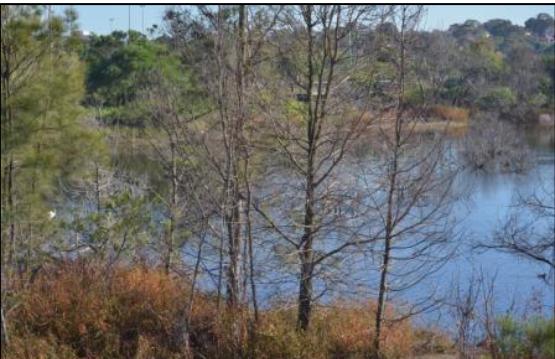
<p>Dry Heathland</p> 	<ul style="list-style-type: none"> • Provides leaf litter and ground debris of variable type and density suitable for foraging and sheltering habitat • Sandy soil provides burrowing opportunities • Open areas provide basking habitat especially where sandstone content is high and outcropping is evident • Provides foraging opportunities for nectivorous insects and hence prey for herpetofauna <p>Species recorded within the habitat type: Cryptoblepharus virgatus, Lampropholis delicata, Tiliqua scincoides</p>
<p>Freshwater Wetland & Riparian Vegetation</p> 	<ul style="list-style-type: none"> • Riparian vegetation, particularly macrophytes surrounding the wetland edge provides breeding, shelter and foraging habitat for frogs • Prey insects breed on open water providing an important food source for frog species • Shaded and open areas provide microhabitat requirements for various frog species <p>Species recorded within the habitat type: Litoria dentata, Litoria peronii, Crinia signifera, Limnodynastes peronii</p>
<p>Creek Lines & Variable Sandstone Rock</p> 	<ul style="list-style-type: none"> • Foraging and shelter habitat is provided for both frog and reptile species • Basking opportunities for reptile species • Breeding habitat in pools and depressions following rain events <p>Species recorded within the habitat type: Crinia signifera, Limnodynastes peronii, Cryptoblepharus virgatus, Acritoscincus platynota</p>

Table 4 cont'd Habitat types present within REP.

Open Sandstone Benching 	<ul style="list-style-type: none"> • Basking opportunities for reptiles • Surrounding vegetation provides shelter and foraging habitat • Shelter available in cracks and under loose rock <p>Species recorded within the habitat type: Acratoscincus platynota, Cryptoblepharus virgatus, Lampropholis guichenoti</p>
Weedy Thickets & Understorey 	<ul style="list-style-type: none"> • Dense weedy vegetation provides foraging and shelter habitat for both frog and reptile species • A variety of habitat types is available within weeds such as Lanatana, exotic grasses and non-local acacia saligna trees across REP <p>Species recorded within the habitat type: Crinia signifera, Limnodynastes peronii, Litoria dentata, Litoria fallax</p>
Landscape Plantings 	<ul style="list-style-type: none"> • Appropriate landscape plantings provide shelter and foraging habitat for frog and reptile species. • Planting along the edges of vegetation facilitates species migration between various habitat types. <p>Species recorded within the habitat type: Crinia signifera, Litoria fallax, Ctenotus taeniolatus, Tiliqua scincoides, Lampropholis delicata</p>

5 REPTILE AND AMPHIBIAN FAUNA OF RANDWICK ENVIRONMENTAL PARK

5.1 Threatened Fauna

5.1.1 Green and Golden Bell Frog *Litoria aurea*

Green and Golden Bell For is the only threatened frog or reptile species to have confirmed records within 5km radius of REP. Green and Golden Bell Frogs (GGBF) are listed as endangered on the NSW *Threatened Species Conservation Act 1995* and vulnerable on the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*. REP provides potential habitat for the species and despite the species not being recorded during the current study its presence at the subject site is still possible.

GGBF are distributed along the NSW and eastern Victorian coasts and some isolated locations west of the Great Dividing Range in NSW, this species inhabits wetlands such as marshes, dams and stream verges. Preferred habitat include unshaded water bodies with adjacent grassy areas and suitable diurnal sheltering sites such as emergent vegetation and rocks. It is known to inhabit highly disturbed sites within the Greater Sydney region (NPWS 1999).

There are five distinct stages of development recognised as GGBFs develop from eggs to frogs: egg, tadpole, metamorphling, immature frog, adult frog. Egg masses of GGBFs are relatively distinctive and are often entangled around vegetation. They are initially deposited at the water surface but sink within 1 to 4 hours still attached to the vegetation. The tadpole stage generally lasts between 10 and 12 weeks, however it has the potential to range from 5 week to 12 months and may be dependent on water temperature with cooler temperatures resulting in longer development time. The metamorphling stage lasts between 3-8 days. Males develop into reproductively mature adults earlier than females. Adult males attract females by calling while floating in open water.

Breeding generally occurs between August/September to March; tadpoles are usually observed from September to April with numbers peaking in January and February. GGBFs are more active during the summer months and as a result, tend to hibernate in dense vegetation or shelter under both man made and natural structures during the cooler winter months.



Figure 1 - Green and Golden Bell Frog *Litoria aurea*

5.2 Non-threatened Fauna - Frogs

5.2.1 Family Hylidae, Genus *Litoria*

Members of the Hylidae family are commonly called Tree Frogs or hylids. The family is quite variable containing the "true" tree frogs and also the water holding frogs that spend most of their lives underground, only becoming active after rain to feed and spawn. The family spans Europe, North Africa, Asia, and the Americas and is represented in Australia by three genera comprising over 70 species (Frogs of Australia 2013). The genera *Cyclorana* and *Litoria* are found in NSW and three *Litoria* species were recorded at REP.

Litoria dentata

The Bleating Tree Frog is found in eastern New South Wales and southern Queensland in coastal lagoons, ponds and swamps, as well as wet forests, woodlands and heath. The species' call is loud and high-pitched, calling from the ground, close to water. The high-pitched screeches of the males are usually heard after heavy spring or summer rain. Mass breeding and calling can take place on warm, wet, overcast nights during spring and summer.

In late spring and summer, the Bleating Tree Frog comes out at night to spawn. During spawning the females lay small rafts of eggs among vegetation in temporary pools. The eggs hatch quickly into tadpoles that must metamorphose into froglets before the pools dry out.

This frog is associated with coastal lagoons, ponds and swamps, in heathland, sclerophyll forest and cleared farmland (Australian Museum 2013).



Figure 2 - Bleating Tree Frog *Litoria dentata*

Litoria fallax

The Eastern Dwarf Tree Frog (*Litoria fallax*), is a small, common tree frog found on the eastern coast of Australia, from Cairns (QLD) to Ulladulla (NSW). Females can reach a maximum size of 25-30 mm, while males may only reach 20 mm when fully grown.

This frog is associated with a wide variety of habitats, including coastal swamps, lagoons, dams, ditches, and garden ponds in forest, heathland, wallum country, and cleared farmland. It lives in reeds and similar plants both near and away from the water.

Breeding occurs at small ponds or dams, which have ample reeds or other emergent vegetation. This species will often breed in temporary water. Its call is a short, high pitched, wr-e-e-ek ip-ip, repeated three or four times (Frogs of Australia 2013).



Figure 3 - Eastern Dwarf Tree Frog *Litoria fallax* recorded at REP



Figure 4 - *Litoria fallax* recorded at REP



Figure 5 - *Litoria fallax* recorded at REP

Litoria peroni

Peron's Tree Frog, sometimes known as the Maniacal Cackle Frog due to its distinctive call, is a large and agile climber, widespread throughout the Sydney basin, but only locally common.

Adults frequent wet and dry forest, woodlands, shrublands, and open areas; often long distances from the water where they spawn during breeding season. Eggs and tadpoles are found in still water in swamps, dams, streamside ponds, and lagoons.

Males call from near water either on the ground or in vegetation. The call is very long and drawn out, slowly pulsed and increasing in loudness - "cra-ah-ah-ah-ah-ah-ah-ah-ahhhk" (Frogs of Australia 2013).



Figure 6 - Peron's Tree Frog *Litoria peroni* recorded at REP

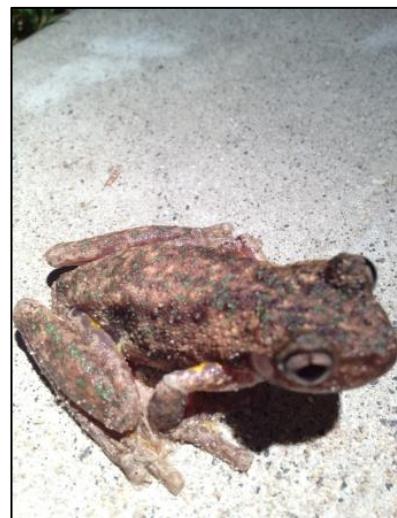


Figure 7 - *Litoria peroni* recorded at REP



Figure 8 - *Litoria peroni* recorded at REP

5.2.2 Family Myobatrachidae, Genera *Crinia* and *Limnodynastes*

Frogs of the family Myobatrachidae are known as the Southern Frogs and are represented in Australia by over 100 species in 21 genera.

Crinia signifera

The Common Eastern Froglet is a small ground dwelling frog, and is one of Eastern Australia's most common and widespread species. Its cricket-like chirping can be heard all day and all year round.

Adults are most common in wet and dry forests, woodlands, floodplains, open and disturbed areas, and alpine grasslands. Within these habitats they shelter under logs and other debris, usually in moist depressions or near water. Eggs and tadpoles are aquatic and can be found in ponds, dams, swamps, flooded grassland, ditches and hollows.

Males call from among vegetation at the waters edge or floating in open water supported by vegetation. The call is a series of three to five pulsed calls, with a chirping quality, rapidly repeated in a long series - "crick crick crick crick crick" (Frogs of Australia 2013).



Figure 9 - Common Eastern Froglet *Crinia signifera*

Limnodynastes peroni

The Striped Marsh Frog is a large wetland-dwelling frog and avid hunter. Its distribution extends along the east coast from Queensland to South Australia. It is most commonly associated with wetlands and permanent water and shelters among reeds and other debris.

Adults can be found in rainforests, wet and dry forests, woodlands, shrublands, open and disturbed areas where they frequent swamps, flooded grasslands, pools and ponds. Eggs and tadpoles are found in still or very slow moving water in swamps, lakes, dams, and isolated ponds.

Males call from the water concealed in vegetation or sometimes concealed under the egg masses. The call is a single short soft explosive note, a "tock" or "poc" (Frogs of Australia 2013).



Figure 10 Striped Marsh Frog *Limnodynastes peroni* recorded at REP



Figure 11 - *Limnodynastes peroni* recorded at REP

5.3 Non-threatened Fauna - Reptiles

5.3.1 Family Scincidae, Genera *Acratoscincus*, *Cryptoblepharus*, *Ctenotus*, *Lampropholis* and *Tiliqua*

There are more than 283 species of skins (family Scincidae) in Australia, of which 78 occur in NSW.

Acratoscincus platynota

Two of the three species in the genus *Acratoscincus* occur in NSW. They are a moderate sized skink with an adult body length of approximately 60mm, they exhibit well-developed pentadactyl limbs and smooth scales.

Acratoscincus platynota is a common and widespread species in NSW, it inhabits dry forest, open woodland and grassland and is usually found under leaf litter and ground debris or sheltering under rocks (Swan *et al* 2004).



Figure 12 - Red-throated Skink *Acratoscincus platynota*

Cryptoblepharus virgatus

Two species of *Cryptoblepharus* occur in NSW, they are small arboreal or saxicoline skinks with well-developed limbs and digits and a generally flattened body shape.

Cryptoblepharus virgatus is known to inhabit woodland areas and rock outcrops, it is both arboreal and rock dwelling in behaviour and is seen on fences or buildings.



Figure 13 - Wall Lizard *Cryptoblepharus virgatus*

Ctenotus taeniolatus

Fifteen (15) of a recognised 96 species of *Ctenotus* occur in NSW, they are small to moderately large skinks with well developed limbs and long tails.

Ctenotus taeniolatus, Copper-tailed skink, is known from a patchy distribution on the coast, ranges and slopes where it inhabits woodland and coastal and sandstone heathlands. It is surface active and often shelters in burrows under rock slabs on sandy soil.



Figure 14 - Copper-tailed Skink *Ctenotus taeniolatus*

Lampropholis delicata & Lampropholis guichenotia

Of the 11 species of *Lampropholis*, 5 occur in NSW, they are small skinks with smooth scales and moderately well-developed pentadactyl limbs.

Lampropholis delicata is a very common and widespread species known from moist habitats including open forest, edges of moist forests, grasslands and suburban areas (gardens).

Lampropholis guichenotia is another common and widespread species known from a wide variety of habitats including open forests, edges of moist forests, grasslands and suburban gardens usually observed in leaf litter and amongst ground debris.



Figure 15 - Garden Sun-skink *Lampropholis delicata*



Figure 16 - Grass Sun-skink *Lampropholis guichenotia*

Tiliqua scincoides

Five (5) of the 7 species of *Tiliqua* species occur in NSW, and are all large skinks with elongated bodies, short limbs and short tails. The five species are all distinctively coloured which can be used to reliably differentiate between the species.

Tiliqua scincoides the Eastern Blue-tongue is common in urban bushland around Sydney and is known to occur in dry sclerophyll forest, open woodland, heath and grassland. It is surface active and commonly found sheltering under ground debris.



Figure 17 - Eastern Blue-tongue *Tiliqua scincoides*

6 RECOMMENDATIONS

The following recommendations are made based on the habitat assessment conducted during the site survey portion of the study and the current and potential management practices at Randwick Environment Park.

- Continuation of bush regeneration activities across the Park including revegetation to increase vegetation and habitat diversity is recommended. Increases in habitat diversity across areas of dense native undergrowth, wetland edges of dense and sparse vegetation, shaded and open pond habitat, open basking areas and variable densities of vegetative ground debris / leaf litter will increase the number and area of micro-habitats and niches available to frog and reptile species and individuals.

Increased diversity of habitat in the groundlayer can be achieved through removal of dominant exotic species such as African Love-grass and replacement with native species such as *Austrostipa pubescens*, *Entolasia stricta*, *Lepidosperma concavum* and *Schoenus ericetorum*. In areas where *Kunzea*, *Leptospermum* and *Melaleuca* species dominate the mid-storey / canopy layer over-dominant species should be removed and replaced with a range of locally occurring natives such as *Allocasuarina distyla*, *Angophora costata*, *Banksia ericifolia* subsp. *ericifolia*, *Banksia serrata*, *Corymbia gummifera*, *Hakea dactyloides* and *Melaleuca nodosa*. This increased diversity in the overstorey will also increase diversity in the leaf litter and ground debris habitats. Selective and methodical replacement of *Acacia saligna* with native locally indigenous trees species should also be undertaken.

Retention of patches of exotic vegetation is essential during bush regeneration activity so as not to completely remove the habitat supported by the weeds. Lantana thickets and dense exotic grasses can provide valuable shelter for frog and reptile species and staged removal and replacement with appropriate native species with similar habits should be ensured.

- Consideration should be given to the removal of Plague Minnow (*Gambusia holbrookii*) from the Park's wetland habitats. Plague Minnows are known to cause significant decline in frog population number through predation on tadpoles and their reduction may result in an increase in abundance and diversity of frog species.

Physical removal of *Gambusia* before the species' spawning season can result in major reductions in abundance, even resulting in complete eradication at some sites. The degree of success depends on site hydrology and hydrological connectivity, ecological value, habitat complexity, habitat size and climate. Best results are achieved by targeting *Gambusia* pre-spawning, in winter-early spring, with water temperatures <16°C and photoperiod <12 hours.

Consideration should be given to the capacity for sustained effort. Unless complete eradication is achieved, suppression of the population size may last little more than a month, therefore repeat removal must be undertaken at intervals such that removal is > the population growth rate. The following summarises the removal process;

- Undertake removal during winter and early spring.
- Target the shallowest, brightest-lit area of water.
- Targeted seine netting is the most effective method, especially for initial visits.
- Set bait traps with the trap entry area at the surface, in an area of water receiving the most direct sunlight.
- Sustained use of even dip nets can be useful if seine netting is not possible.
- Repeat targeted effort over several weeks (DSE Victoria 2011).
- Habitat restoration and augmentation is also recommended across the Park to increase the availability of different habitats required by frog and reptile species throughout their life-cycle. *Acacia saligna* trunks removed during weed control / bush regeneration activities should be retained and cut-up and scattered across the all zones within the Park to provide shelter and basking habitat for frogs and reptiles in a number of different micro-habitats.

Creation of semi-permanent and temporary ponds, where water will be retained periodically on a different cycle from the main wetland, will increase wetland habitat variability in the Park. Excavation of areas of variable size and depth at a range of distances from the deepest parts of the wetland should be undertaken. Ponds should be waterproofed and rock armoured for stability and designed such that they are filled from rain events or over flooding of the main wetland. The edges of the ponds should be planted out with locally occurring native clumping graminoides such as *Caustis flexousa*, *Dianella revoluta*, *Entolasia marginata*, *Entolasia stricta*, *Isolepis nodosa*, *Lomandra longifolia*, *Schoenus ericetorum* and *Themeda australis*.

Placement of sandstone rock of various sizes and character throughout the Park in areas where basking opportunities are lacking is also recommended. Preference should be given to areas with north or west facing aspects and rock should be installed in piles to provide shelter between the rocks and on the ground for burrowing opportunities underneath. Placement of rock adjacent to areas of habitat where reptiles can quickly retreat for shelter, and consideration of opening the canopy in various areas to increase sunlight to the ground are also recommended management options.

- Education of the community surrounding REP on topics such as of frog and reptile friendly gardens that incorporate frog ponds, sandstone rock features, logs and branches and areas of native groundcovers, the effects of herbicide / pesticide use on frogs and reptiles and the effects of domestic and feral cats on herp populations. Community planting days within REP could be used as a way to promote education and awareness of frog and reptile populations and help to increase habitat diversity within the Park.

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Photos:

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Appendix A

Survey Maps

Randwick Environment Park
Frog and Reptile Study



