Survey Report on Frog Fauna

in the Darwin Wharf Precinct

Technical Report
prepared for the Draft Environmental Impact Statement
for the Darwin City Waterfront Redevelopment

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Contents

1 BACKGROUND

Surveys were conducted by Graeme Sawyer and Ian Morris, and identifications were made from call, by visual sighting of frogs and by tadpole identification.

The area has been surveyed on four occasions during wet season conditions when frogs are known to be feeding and breeding, using a combination of listening from set locations, 'drive throughs' along roads, and walked transects. An audio recording was made on Saturday 6th March 2004 from the area of the old Deckchair cinema, area marked on the supplied map as former Stokes Hill Power Station. There were significant numbers of frogs in the area, consisting of a number of species with a known adaptability to environmental alteration eg. those frogs which can live and breed in a man-modified landscape (see below for details).There were significant numbers of frogs in this area, numbering in the hundreds, the population showed evidence of adults, young frogs tadpoles and breeding activity..

1.1 SURVEY TIMES

Saturday 6th March 7:50 pm
After rain.

- Significant numbers of frogs calling in old Power Station area
- Marbled Frog (*Limnodynastes convexisculus*), Red Tree Frog *Litoria rubella* and Rocket Frog (*Litoria nasuta*) calling
- Green tree frogs (*Litoria caerulea*) seen
- Drive through the remainer of site revealed no other calling species
- Green Tree Frogs (*Litoria caerulea*) and Red Tree Frogs (*Litoria rubella*) evident along pipeline on edge of road along the bottom of the escarpment.

Friday 13th March 9.30 pm
Conditions: After rain during the afternoon

- *Limnodynastes convexisculus*, *Litoria rubella* and *Litoria nasuta* calling
- Green Tree Frogs seen
- Detailed look around the Stokes Hill fuel tanks site revealed tadpoles in puddles around tanks and drains leading from the tank area out onto the old power station site. Roth's Tree Frog (*Litoria rothii*)*,Red Tree Frog (Litoria rubella),* Marbled frog *(Limnodynastes convexiusculus)* tadpoles and Green Tree Frog (*Litoria caerulea*)tadpoles present. Also metamorphs.of these species.
- Northern Dwarf Tree Frogs (*Litoria bicolor*) in vegetation in the area around the Stokes Hill Fuel Tanks

Sunday 15th March 9.00 pm

- Intermittent calling of *Litoria rubella* and *Limnodynastes convexiusculus* in the old power station area. No calling the at south west end of survey area.

Monday 22nd March 8.40 pm

- Calling *Limnodynastes convexiusculus, Litoria rubella*, *L. rubella* in large numbers on areas marked on map as Warehouse Area, especially around the warehouse 2 area adjacent to escarpment area outside the site boundary. Collected around flooded excavations.

2 SPECIES

The following species have been recorded in the area

Rocket frog *Litoria nasuta*
Marbled Frog *Limnodynastes convexiusculus*
Green tree Frog *Litoria caerulea*
Red Tree Frog *Litoria rubella*
Northern Dwarf Tree Frog *Litoria bicolor*
Roth's Tree Frog *Litoria rothii*

2.1 INCIDENTAL SIGHTINGS

The following other species were seen during the survey.

Slate-grey snake *Stegonotus cucullatus*
The presence of these frog predators indicates there are some predator dynamics impacting on the frog populations in the area.

Bynoe's Prickly Gecko *Heteronotia Binoei*
Tawny Frogmouth *Podargus strigoides*
Barking Owl *Ninox connivens*

2.2 BREEDING POPULATIONS

The presence of tadpoles and metamorphs indicate that currently breeding is successful in the areas around the remaining fuel tanks in the Stokes Hill Fuel Tanks area and the adjacent areas and connecting drains. Tadpoles and metamorphs as well as breeding activity were reported from this area

Breeding activity was recorded on construction areas near the old deckchair cinema location, the former Stokes Hill Power Station, and in the areas opposite the World War II storage tunnels along Kitchener Drive, in the Warehouse Area as marked on the Map. Many of these breeding sites occurred in depressions created by earth-moving activity which are likely to be temporary.

3 COMMENTS

The overall populations seem to be healthy although much of the breeding activity was noted from construction areas and temporary pools left by earth moving equipment. The main breeding area, and the area where metamorphs were seen, was the south east end of the survey area, on the south-east side of the wharf road. This included the area where the drains emerge from the Tank area as well as a flooded section along the front of the concrete wall near the Pearling museum end of the section. Flooded low areas across the section attracted *L. Rubella* after rains.

Refuge sites would appear to be the vegetation strip along the escarpment edge and the area surrounding the remaining fuel tanks and in drains and old pipe infrastructure in the Stokes Hill Fuel Tanks area. After rain the frogs, especially *Litoria rubella* and *Litoria nasuta* moved into pools of water below the tank locations to call. *Litoria rubella* moved across the road into pools around the construction sites right across the area with the exception of the area at the North East end of the site. We suspect this area would also be utilised earlier in the wet season with frogs moving from the escarpment and Government House area.

The diversity of the site was relatively low although there were good numbers of most of the species present. Low numbers of *Litoria rothii* and *Litoria bicolor* were recorded. These species were not calling during the survey period and may be found in larger numbers if surveyed earlier in the wet season.

All of the species recorded are tolerant of disruption to natural habitats and are able to tolerate, even benefit from development. The *Litoria* species recorded are likely to continue to persist in built up areas and the *Limnodynastes* species will do the same if habitat is available along drains or vegetated areas within the area and water quality remains reasonable.

Refuge areas along the escarpment between the survey area and the city would appear to be a key dry season refuge and are likely to maintain this function, provided the escarpment vegetation, including both the canopy, understorey and litter layer is maintained.

The other refuge areas around the old power station site will be changed by development but some drain lines will be maintained. These are likely to provide refuge for the species noted. Long-term population viability will be determined by breeding opportunity in the redeveloped area. The *Litoria* species are likely to be able to utilise small water sources within in the redeveloped area. The *Limnodynastes* species are also likely to remain viable in the area, especially if vegetated areas with mulch or leaf litter and drains that hold some water are maintained in the new development.

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