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Mr Kevin Morton
Senior Coastal Engineer
NSW Trade & Investment (Crown Lands)
PO Box 2185, Dangar, NSW, 2309

Emailed to: kevin.morton@crownland.nsw.gov.au

Dear Kevin,

Subject: ***Targeted Green and Golden Bell Frog and Wallum Froglet surveys – Proposed Dredge Pipeline, Swansea NSW.***

On the 15 October 2014, an ecologist (Luke Foster) undertook a number of surveys at several locations within the proposed Dredge Pipeline footprint specifically targeting the Green and Golden Bell Frog (*Litoria aurea*) and the Wallum Froglet (*Crinia tinnula*). These surveys included:

- Detailed habitat assessment of the *Drain Zone* which includes two constructed drains with open water and limited emergent vegetation;
- Detailed habitat assessment of the *Disturbed Area - former night soil disposal access road zone* which is a highly modified area dominated by exotic species; and
- Targeted surveys of both areas for approximately 1 hour. Targeted methods included call playback and habitat searches.

The results of the surveys are discussed below:

Habitat Assessments

Detailed habitat assessments of both areas concluded that there was low quality habitat for both species. This determination was due to the high levels of disturbance observed on site including oil, rubbish, sedimentation from road runoff, cats and disturbance from vehicle and pedestrian access. Detailed assessments are attached to this document.

Targeted Field Surveys

Targeted field surveys were undertaken on the night of 15 October 2014. **Table 1** highlights the weather conditions during surveys. The survey timing was ideal having followed a substantial rainfall event.

Table 1: Weather conditions

Item	Drain Zone	Disturbed Area
Time of survey	8 pm	8.30 pm
Temperature (°C)	14.7	15.1
Humidity	76.5%	76.5%
Air pressure	1016.5 hPa	1017.0 hPa
Rainfall	Bureau of Meteorology Station 061406 - Newcastle (Blacksmiths) 12mm on 14/10/2014 and 34mm on 15/10/2014	

Neither of the target species was detected at either site during surveys. *Crinia signifera* (Common Froglet) was detected in adjacent vegetation to the Disturbed Area. Three cats were observed across all sites, two within the mangroves at the Drain Zone and one walking along the access road within the Disturbed Area.

Conclusion

The habitat present at both sites is of poor quality due to a range of factors. The presence of high levels of ongoing disturbance, cats and limited vegetative cover indicates that it is unlikely that either the Wallum Froglet or the Green and Golden Bell Frog inhabit these areas. As such the laying of the dredge pipeline may occur within these areas without any additional controls or management for threatened frog species.

If you have any questions regarding these surveys or results, please contact the undersigned.

Kind regards,

Luke Foster **MEnvSc&Mgt (Wildlife Ecology), BEnvSc&Mgt**

Ecologist

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Habitat Assessment **Location:** Disturbed Area - former night soil disposal access road zone **Date:** 15/10/2014

Question	Response	Notes
Is the site within the expected range of the species?	Yes	Wallum Froglet known from region, Green and Golden Bell Frog potentially in region.
Are there records of the species within the local area/catchment?	Yes	Two records of Wallum Froglet within 5km, Zero records of the Green and Golden Bell Frog.
Does the site support potentially suitable habitat for the species?	No	Disturbed roadside puddles/pot holes. High levels of disturbance evident from vehicles, pedestrians and pollutants (runoff and rubbish). Low quality habitat for both species.
Are there other frog species on site? If so, what species?	Yes	Crinia signifera (Common Toadlet) sighted and heard calling adjacent to site within the Swamp Forest EEC. No individuals were observed or heard within the puddles themselves.
What vegetation occurs on and around the site?	-	Limited vegetation around puddles. Species included Cyperus sp. and exotic grasses. Remnant vegetation occurs within 5m of ponds and is part of the Swamp Forest EEC.
How close is the nearest water body?	-	Nearest water-body is a small lake on the Belmont Golf Course, approximately 100m to the north.
How many water bodies occur within 10 km?	-	>10
Is there habitat connectivity (terrestrial or aquatic) between water bodies on site, and between on-site water bodies and those on neighbouring sites?	No	At times of high rainfall some connectivity may occur (flooding).
Is there any evidence of disturbance on site?	Yes	Roadside ponds show evidence of vehicle disturbance (bikes) and pedestrian disturbance. Rubbish (litter) also evident.
Has this habitat been modified as a result of previous development actions?	Yes	The roadside ponds are not natural water bodies. They have been formed due to the closing off and discontinued maintenance of the road.
Are water bodies infested with Mosquito Fish or other predatory species that prey on the target species?	No	No Mosquito Fish were observed within the roadside puddles.
Are there other threats occurring on site?	Yes	Includes: Reduction in water quality and hydrological changes (for example, pollution, siltation erosion and changes to timing, duration or frequency of flood events) Disease (for example, infection of the frog with chytrid fungus (Batrachochytrium dendrobatidis) resulting in chytridiomycosis) Predation (for example, by the introduced Mosquito Fish, Cats (Felis catus) or Foxes (Vulpes vulpes)) – one cat was observed during surveys. Introduction or intensification of public access to Green and Golden Bell Frog habitats.

Habitat Assessment **Location:** Drain Zone **Date: 15/10/2014**

Question	Response	Notes
Is the site within the expected range of the species?	Yes	Wallum Froglet known from region, Green and Golden Bell Frog potentially in region.
Are there records of the species within the local area/catchment?	Yes	Two records of Wallum Froglet within 5km, Zero records of the Green and Golden Bell Frog.
Does the site support potentially suitable habitat for the species?	Yes	Waterside vegetation, shelter sites, slow flowing water (in times of low runoff), mixture of fresh and saline water. Low quality habitat for both species.
Are there other frog species on site? If so, what species?	No	No other species were detected during surveys.
What vegetation occurs on and around the site?	-	Phragmites australis (Common Reed) and Grey Mangrove.
How close is the nearest water body?	-	The drainage lines connect to an arm of Awaba Lake. As such both drain outlets fall within 10m of the main waterbody.
How many water bodies occur within 10 km?	-	>10
Is there habitat connectivity (terrestrial or aquatic) between water bodies on site, and between on-site water bodies and those on neighbouring sites?	Yes	Both drain outlets connect to the lake.
Is there any evidence of disturbance on site?	Yes	High levels of disturbance are present on site. Litter, oil and general runoff was observed. Heavy weed infestation is also evident.
Has this habitat been modified as a result of previous development actions?	Yes	Yes. The drainage outlets are not natural waterbodies. Both are highly modified habitats.
Are water bodies infested with Mosquito Fish or other predatory species that prey on the target species?	No	No Mosquito Fish were observed in either drain.
Are there other threats occurring on site?	Yes	Includes: Reduction in water quality and hydrological changes (for example, pollution, siltation erosion and changes to timing, duration or frequency of flood events) Disease (for example, infection of the frog with chytrid fungus (Batrachochytrium dendrobatidis) resulting in chytridiomycosis) Predation (for example, by the introduced Mosquito Fish, Cats (Felis catus) or Foxes (Vulpes vulpes)) – two cats were observed within the mangroves above the drainage lines. Introduction or intensification of public access to Green and Golden Bell Frog habitats.