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Our Ref: Cockatoo Coal - Biodiversity Offsets Assessments Lot 9 Ornamental Snake Surveys

16 February 2015

Victoria Musgrove
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Cockatoo Coal Limited

Via email: vmusgrove@cockatoocoal.com.au

Dear Victoria,

RE: Baralaba North – Biodiversity Offset Investigation, Lot 9 Zamia Targeted Ornamental Snake Surveys

To investigate the suitability of the Zamia (Lot 9) property as a potential biodiversity offset for the Baralaba North Continued Operations Project (BNCOP), targeted threatened species surveys were undertaken from the 1st – 4th November 2014.

As part of those field surveys, gilgai formations were identified within an area of approximately 100 Ha in the central western portion of the site (see Figure 1). These areas supported dense regrowth brigalow to 5 m on deep cracking clays, where significant cracks, crevices and sink holes were observed (see Figure 2). The gilgai were considered to be well defined and formed, consisting of a mosaic of depressions and mounds and they supported vegetation characteristic of wetland habitats (see Figure 3).

At the time of these surveys, environmental conditions were very dry. Rainfall recorded for 2014, prior to the November surveys, was well below the collated average data for the local area (recorded at Bureau of Meteorology, Bauhinia Downs Store, see Figure 4). As such, conditions were considered to be very poor to adequately survey for the ornamental snake and none were positively identified during this survey.

However, given the diverse characteristics of the gilgai observed within the areas identified, it was considered likely that these habitat areas potentially supported population/s of ornamental snakes.

In order to confirm the suitability of the habitats supported on-site for an offset for the ornamental snake, additional targeted surveys were undertaken from the 20th to 22nd January 2015, following significant rainfall in the local district.

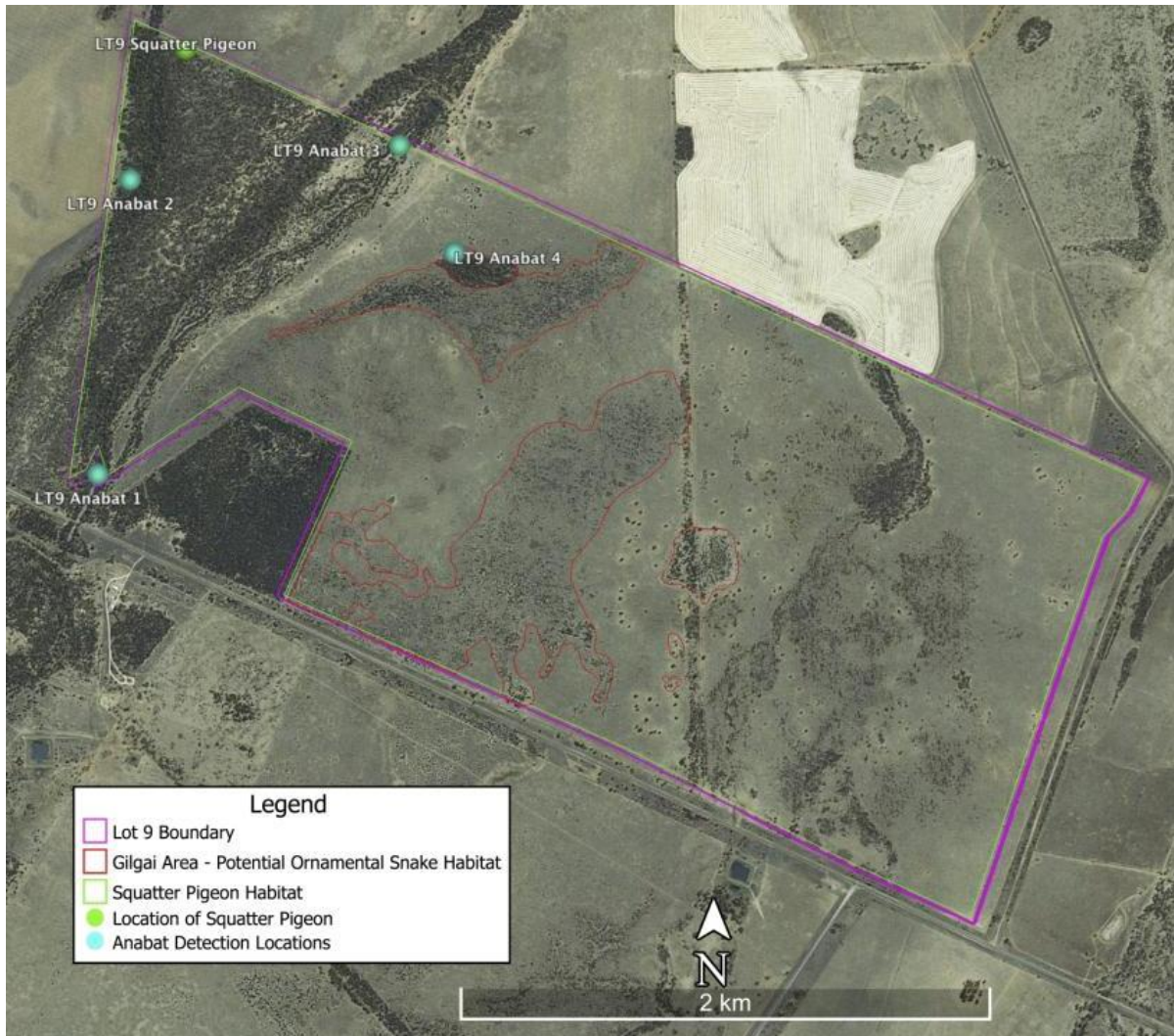


Figure 1 Lot 9 (north) – Location of Habitat Features and Target Species



Figure 2 Photograph of Cracks and Crevices, Lot 9



Figure 3 Photograph of Gilgai Formations with Sink Holes, Lot 9

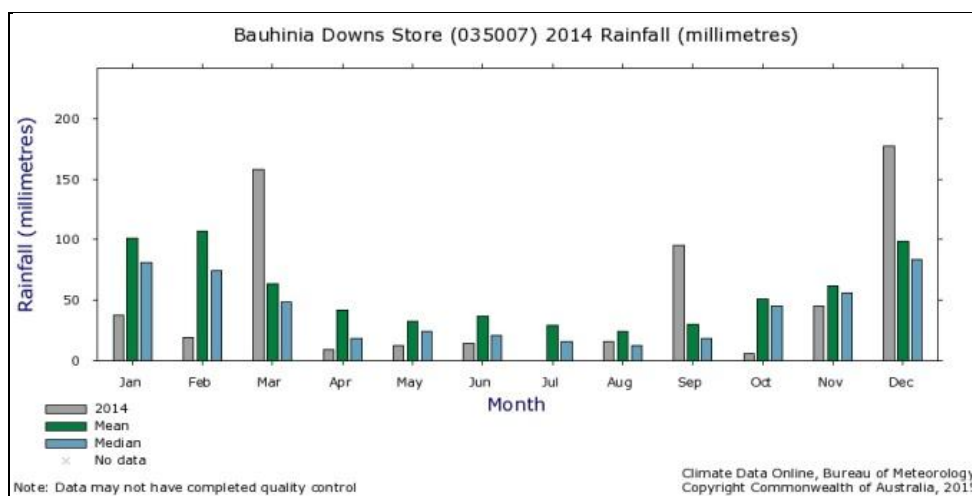


Figure 4 2014 Rainfall Bauhinia Downs Store

The local area received 177 mm and 79.4 mm of rainfall in December and January (prior to the survey) respectively. During the survey period, an additional 41.4 mm of rainfall was recorded. Consequent of this rainfall and the swelling of the grey clays, all but the very largest ground cracks were closed. Numerous gilgai supported surface water, with some supporting established aquatic vegetation such as sedges and bog marsh (*Monochoria cyanea*), which are common elements within these gilgai features under suitable environmental conditions.

The surveys were conducted over three nights from approximately 6pm – 1am at targeted areas supporting the best habitat characteristics for this species within the 100 ha area of gilgai habitat. Target sites were selected in the late afternoon/early evening, with nocturnal ground searches conducted using hand held spotlights. Three primary areas were surveyed.

At all survey areas, a diverse and abundant assemblage of frog fauna species were observed. 13 species in total were observed as follows:

- *Cyclorana alboguttata* greenstripe frog
- *Litoria caerulea* green treefrog
- *Litoria fallax* eastern sedgefrog
- *Litoria inermis* bumpy rocketfrog
- *Litoria peroni* emerald-spotted treefrog
- *Litoria rothii* red-eyed treefrog
- *Litoria rubella* naked treefrog
- *Platyplectorum ornatus* ornate burrowing-frog
- *Limnodynastes salmini* salmon-striped frog
- *Limnodynastes tasmaniensis* spotted marsh frog
- *Limnodynastes terraereginae* scarlet-sided pobblebonk
- *Uperoleia rugosa* chubby gungan
- *Rhinella marinus* cane toad

The surveys recorded two ornamental snakes, a sub-adult and an adult near the Zamia Creek Conservation Park. The occurrence of the sub-adult indicates that the ornamental snake has been/is breeding within the gilgai habitats supported on Lot 9 (north).

From the results of the surveys, it is considered highly likely that ornamental snakes are supported in all areas where gilgai formations are present.

Identified Management Issues

The site supports an extensive infestation of parthenium which, whilst the impact of this listed weed is not fully known for the ornamental snake and other target threatened species, e.g. squatter pigeon, it potentially reduces the value of the site for an offset. The control, reduction and elimination of parthenium should be addressed within the management plan for the offset if accepted.

Cane toads were observed across the areas surveyed and it is highly likely that they occur across the whole of the site. Cane toads have been listed as a key threatening process under the EPBC Act. In some areas, cane toads dominated the amphibious fauna. Cane toads have been identified as causing mortality in ornamental snakes, both juveniles and adults. Consequently, the control, reduction and elimination of cane toads from gilgai

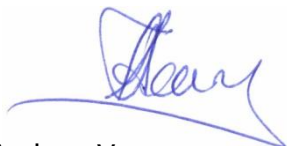
habitats should be addressed with the highest priority within the management plan for the offset if accepted.

In addition to the impacts of cane toads on ornamental snake populations, the effects of cattle accessing flooded gilgai to drink has been linked to mortality of snakes and the degradation of gilgai formations which impacts on the species ability to survive and persist under grazing regimes which do not exclude cattle from gilgai areas. As such, for the offset to maintain and ultimately improve in value for this species, the management plan for the offset must adequately address the impacts of grazing on gilgai formations and the flow on effects to the ornamental snake population of the site.

Victoria, I'd like to thank you for the opportunity to undertake the targeted surveys for the ornamental snake on Lot 9 north, Zamia and we look forward to continuing our involvement with this project for Cockatoo Coal. Please do not hesitate to contact me on 0402 882 038 if you would like to discuss the outcomes of the targeted species surveys undertaken to date.

Yours faithfully,

Footprints Environmental Consultants



Andrew Veary

Director