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CZR Robe Mesa Project.
Response to comments provided by DMIRS, February 2024 and August 2024
M. Bamford

FEBURARY 2024 RESPONSE

NORTHERN QUOLL

DMIRS comment
Complex, rocky landforms in close proximity to permanent water are considered critical habitat as they provide refuge from predators and other threats (e.g. fire), access to food, and shelter for denning. Watercourses facilitate connectivity for dispersal and foraging. Given Bamford (2023) determined Northern Quolls were residents of the project area and were recorded during each survey phase, there is an abundant population present. While the mine has been designed to limit impacts to denning habitat, my concern is related to impeding the fauna corridor along the eastern mesa edge the Robe River. As not much is known about northern quoll movement ecology, it requires consideration that the development my impact the local population and connectivity to the broader Robe River Valley populations.

Response
This is a very important point as the species is clearly abundant in the area, with animals concentrated around the mesa edge but also along the major drainage lines, and the BCE study had records of individuals moving across the flats. There were also records from some isolated hills in the project area, and along major drainage lines to the south-west. The BCE report does note the risk of population fragmentation due to the access haul road proposed to the east of the mesa, but not specifically for Northern Quoll, and does consider the risk of mortality on that road (including for Northern Quoll). The risk of roadkill exists because Northern Quoll will readily cross roads, although this appears to be poorly documented except for the recognised risk of roadkill.

During the October 2021 field trip, a dead Northern Quoll was found on the main sealed road west of Pannawonica. There have been some studies into the movement patterns of Northern Quoll (Moore *et al* 2022), and they regularly move distances of one to three kilometres in a night (Oates and Johnson 2015), with males particularly mobile. Oates and Johnson (2015) also found some displacement due to mining activity, but that animals remained in and utilised shelter and foraging habitat close to mining.

Mining infrastructure was also used for shelter (presenting a risk to the animals in some cases). The main risk from the proposed mine would appear to be deaths on roads and possibly from animals occupying infrastructure, rather than through a loss of movement across the landscape. Northern Quoll will use underpasses (Ecoscape 2021, Bleby *et al*. 2022), and these are recommended as a risk mitigation action for some mining projects in the Pilbara (Bleby *et al*. 2022). The position of the access haul road on the eastern side of the mesa and across Mungarathoona Creek lends itself to underpasses at the creek itself (ie where the creek will need to be crossed) and along the mesa edge.

Note that use of underpasses by Northern Quoll is poorly-studied and, with a large local population and a high likelihood of animals moving through the area of the proposed haul road to the top of the mesa, monitoring of use of underpasses would be valuable.

CONSERVATION SIGNIFICANT BATS (Pilbara Leaf-nosed Bat and Ghost Bat)

DEMIRS comment

PLNB favours the highly productive and structurally complex riparian zones where water is permanently available and insect biomass is sufficiently high. Females are highly dependent on foraging habitat within close proximity to maternal roosts, however they have been known to fly >20 kilometres from diurnal roosts to occupy non-permanent roost caves, and there are two known category 1 and 2 roosts located within 20 kilometres of the application area. It is also known the PLNB is highly sensitive to noise and vibration, and given caves weren't assessed and roosts categorised it is difficult to determine if the operations will impact the species. Threats to the PLNB were recently reviewed and include cumulative impacts; disturbance and destruction of roosts (includes secondary impacts of mining such as vibration, dewatering, light, noise and blasting); degradation and fragmentation of foraging habitat; inadequate buffer zone implementation; hydrological change (i.e., loss of permanent water and reduction in water quality/pollutants). While direct impacts from destruction of caves within the mesa edges is limited, the importance of foraging habitat will be considered as part of the assessment.

Response; PLnB

Caves were assessed around the mesa but were not assigned categories as outlined in the DCCEEW conservation advice on the species (Threatened Species Scientific Committee (2016). The mesa landscape did not lend itself to the use of such categories as the mesa edge was a breakaway with more or less continuous overhangs, depressions, undercuts and shallow caves. It was thus difficult to recognise discrete locations. It was noted, however, that there was a large valley in the west with several probably interconnected caves, and that the western and northern mesa edge was a higher breakaway with more crevices than the eastern/southern edge. ARUs were deployed in May 2021 (10 locations), October/November 2021 (10 locations), July 2022 (4 locations) and September 2022 (5 locations). However, devices either failed or recorded no significant bat species in October/November 2021 and July 2022. Thus, useful data only from May 2021 (outside breeding season) and September 2022 (breeding season).

Locations in these two surveys were around the mesa, close to pools along drainage lines, at isolated rocky hills, on the plains and alongside a tree-lined dry creekbed. Very few records were obtained even when units were placed to a previously recorded maternity roost site, but this probably reflects annual variation in the use of that site.

In May 2021, there were single records on the flats, near a drainage line (upper end of Mungarathoona Creek), on both eastern and western sides of Mesa F, and outside a cave system previously identified as a maternity roost site. It was concluded that 'the cave structures within Mesa F appeared suitable for seasonal roosting Pilbara Leaf-nosed Bats, but were probably not suitable for maternity roosts. Pilbara Leaf-nosed Bat records were generally made late at night or about an hour before sunrise, suggesting the animals had travelled some distance from a roost site before they were detected'. Such usage would be consistent with the caves of the mesa serving as temporary nocturnal roosts outside the breeding season for the PLnB (nocturnal refuge – priority 4), although they may also be used by small numbers of animals as diurnal roosts (priority 3). The most likely location of priority 3 roosts would be in the western valley.

In September 2022 (Table 25 in the report), there were no records around the mesa, a single record along Mungarathoona Creek, and multiple records around the camp and particularly at the tree-lined dry creekbed in the south (Figure 32 of the report). The timing of recordings at the creekbed (within 17 minutes of last light) suggests a moderately large roost (probably a maternity roost), probably in hills to the south (indicated by the lack of large numbers of records elsewhere in the project area at the time). An ARU set at the large valley in the east of the mesa detected no PLnB, and nor did an ARU set on an isolated hill nearby. While not conclusive, this suggests limited roosting activity during the breeding season in Mesa F at least at the time of the surveys. Thus, the caves may have limited value as impermanent roosts during the breeding season. As noted during the May 2021 investigations, the caves appeared to be shallow and to lack the depth and high humidity favoured by the species.

Overall, it would appear the PLnB roosts nearby and enters the project area to forage, and probably occasionally to roost in small numbers, particularly outside the breeding season. There will be buffer zones to protect the mesa edge and major drainage systems, and hydrological impacts will be minimised.

<u>Response; Ghost Bat</u>
DMIRS (February 2024) made no specific comments about the Ghost Bat,

REFERENCES

Bleby, K., Kristancic, A., Huang, N. and Mike Bamford, M. (2022). Review of the use of Underpasses for Northern Quoll in the Ashburton Infrastructure. Unpubl. report to Mineral Resources by Bamford consulting Ecologists, Kingsley.

Ecoscape (2019). Rail Culvert Fauna Monitoring 2018, Roy Hill. Unpublished report for Roy Hill.

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Moore, H. A., Michael, D. R., Dunlop, J. A., Valentine, L. E., Cowan, M. A., Nimmo, D. G. (2022). Habitat amount is less important than habitat configuration for a threatened marsupial predator in naturally fragmented landscapes. *Landscape Ecology*, **37**: 935-949.

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AUGUST 2024 RESPONSE

CONSERVATION SIGNIFICANT BATS

DEMIRS comment

It is difficult to adequately assess potential impacts to Pilbara Leaf-nosed Bat and Ghost Bat as a systematic cave assessment has not been conducted. The available information does not indicate how either species utilises the site, the population size, nor the category of roosts present. Bamford Consulting Ecologists (BCE, 2023) reported that cave structures within Mesa F appeared suitable for seasonal roosting for both bat species and both species were also recorded along and emerging from mesa edges within the application area. This challenges the later response from BCE (2024) that "*the mesa landscape did not lend itself to the use of such categories as the mesa edge was a breakaway with more or less continuous overhangs, depressions, undercuts and shallow caves*" when noted that the roosts weren't categorised. A cave assessment would likely reveal the importance and significance of the area proposed to be cleared as it would reveal potential occupation of the area and determine if available caves constitute as critical habitat.

Therefore, it is requested that a cave assessment be conducted to adequately quantify impacts to these bat species. DBCA recommends that detailed cave assessments should be conducted for all mesa edges to get a complete picture of ghost bat and Pilbara leaf-nosed bat resources and potential usage of the area. Surveys should be repeated twice, approximately six months apart since both species have the potential to be present in some or all seasons. Inspected caves should be listed with a description of their internal characteristics and a proposed roost categorisation following the standardised nomenclature provided in the Conservation Advice for each species. A cave assessment will also inform if the minimum 50 metre buffer from the mesa edge will be true in-situ. In the absence of a cave assessment, if a decision to grant the permit is made a 250 metre buffer applied to the mesa edge will be considered as a condition on the permit.

Response:

The original report provides a description of observations of both the environment of the mesa and of bat records, and clearly describes the why in which both species utilise the area. The pattern of bat records does not suggest high levels of usage; indeed it suggests low levels of usage (thus the categorisation (in the 2024 response) of priority 4 roosts, with possible/probably priority 3 roosts in caves in the western valley and perhaps along the western and northern mesa edge). Both flanks of this western valley were cliffs with caves at the base of the cliff (see Plate 6 of the 2023 report which

illustrates the complex nature of the breakaway). These caves were mostly only a few metres deep but with narrow recesses that could not be entered.

The base of the cliff was really an overhang with multiple recesses of varying depth, but as far as we could tell there were no deep chambers of the sort favoured by these bat species for major roosts. There were also heritage concerns with us entering the recesses/caves. The lack of large aggregations of bat droppings at the entrances, and the low number of actual bat records, further suggests that at least at the time of our surveys, large numbers of bats were not present. While potentially circular logic, this scarcity of records suggests the caves do not have the features favoured as significant roosts. Observations in the original report are entirely consistent with our later response; noting that the later response provides the requested roost categorisation (but recognising that the structure of the mesa edge means that individual distinct caves are difficult to identify, and the roost categorisation is better applied to sections of the mesa rather than trying to single out individual 'caves'). The structure of this mesa is such that there are shelter opportunities right along the mesa edge. It is more important to recognise the landscape and its importance, rather than to single out individual caves.

As clearly stated, the western valley does have larger overhangs and deeper recesses and caves than elsewhere around the mesa, but no evidence of high levels of usage by either bat species. The report also states that the western and northern edges of the mesa have more opportunities for roosting than the eastern and southern edges. Thus, a cave assessment was conducted, but it was an assessment of sections of the mesa edge rather than trying to identify individual caves. It is difficult to understand what value there would be in revisiting these areas and how further assessment of the landscape would help to 'adequately quantify impacts'.

This does not mean the mesa is not important for the bats, but that it appears to support bats only for part of the year and in small numbers. The structure of the landscape and the bat records suggest this. The bats do need this sort of landscape for dispersal and to forage widely, and therefore the mesa edge is valuable, and usage should be monitored. Note that the most important observation on bats was probably of PLnB moving along a drainage line shortly after sunset in September 2022, suggesting a maternity roost located to the south.

NORTHERN QUOLL

<u>DEMIRS comment</u>
The NCVP supporting document (CZR Resources, 2023) states "*the northern quoll is present in relatively small numbers, typical of similar habitat in the locality*" however the original findings by BCE (2023) reported northern quolls as being "a*bundant around the mesa edge, with records also along drainage lines across the surrounding plains*" with records on the "*mesa edge, on top of the mesa, on an isolated rocky hill…, along drainage lines… and even on sandy flats several hundred metres from rocky landscapes*."

Northern Quoll detection rates modelled by DBCA (Palmer et al., 2022)[1] also recorded Northern Quolls in high density in this area, supporting the BCE (2023) report findings that northern quolls frequently occur within the application area. It is noteworthy that the presence of northern quolls on flats several hundred metres from rocky landscape is indicative of the importance of this site for northern quolls as they often preferentially utilise rocky landscapes as refugia to avoid introduced predators.

The significance of the loss of mesa top habitat for northern quolls is not outlined and the likely decline in local populations from being forced to forage in areas with higher introduced predator pressure has not been considered. This poses a threat to their continued presence at current population levels, which occurs at a higher density than typical.

While the small area proposed to be cleared to construct the run-of-mine is unlikely to be significant in isolation, the broader mesa edge provides key habitat for northern quolls, Pilbara leaf-nosed bats, and ghost bats (denning/roosting). It is highly likely they would traverse and forage in the plains between the mesa edge and permanent pools to the east of the application area. The clearing east of the mesa edge is likely to disrupt faunal movement for at least a portion of the populations residing in the application area. The proximity of the application area to permanent and semi-permanent water sources increases the significance of the proposed clearing adjacent the mesa.
[1] Palmer, Gibson, Craig and Pitt (2022) Managing feral cats to protect norther quolls in the Pilbara. https://library.dbca.wa.gov.au/Journals/080525/080525-106.pdf

Response and additional information (BCE)
The statement in the NVCP application was based on the relative importance of the mesa tops and will be amended to provide further context. Footprints of the species were found on the flats several hundred metres from the mesa, and across the top of the mesa (only one set of tracks in each area). Plate 24 of the 2023 report illustrates the abundance (footprints in sand) of the species along a nearby river and several hundred metres from the nearest rocky area.

The top of the mesa was largely a sparse landscape and while it may represent foraging habitat, the footprints found in this area may have been of an animal simply moving from one side of the mesa to the other.

Mining across the mesa top would reduce the ability of animals to move through this area, but it is not clear why this would force animals to forage in areas with increased exposure to predators. There is very likely to be great movement of animals across the plains between the mesa and the drainage lines to the east (moist landscapes in this environment probably being most productive for foraging) and the BCE (2023) report identifies this as a concern. Predation risk (Feral Cats) is also identified as a concern in the report.

FAUNA – OTHER

Pilbara olive python

DEMIRS comment
(*Liasis olivaceus barroni*) was not detected during field investigations, which is understandable they are highly cryptic and difficult to survey for. Much of the habitat connectivity concerns for northern quoll and the bats species also applies to Pilbara olive python, as the major watercourses (such as Mungarathoona Creek just east of the mine area and Warramboo Creek at the southern haul road route) provide suitable habitat, and rocky areas including the mesa of the mine area may be used for shelter during the cooler months. DBCA deem that they are almost certainly present within the area, with recent records less than 1km from the mine pit. Given the haul road crosses drainage lines there may be direct mortality from vehicle strikes. This has not been addressed and populations may be small and therefore sensitive to the regular loss of even a small number of individuals.

Response:
These conclusions and concerns are identified in the BCE (2023) report, which concluded that road mortality was a minor to moderate risk for the Pilbara Olive Python, recognizing that the population could be at risk from loss of even small numbers of individuals.

Night Parrot

DEMIRS comment:
(*Pezoporus occidentalis*) is reported as a vagrant species, however not assessment of habitat suitability was included in biological assessments. DBCA guidelines (2024) include the Hamersley subregion as a high priority survey bioregion where the occurrence of night parrot must be considered in the planning and assessment of proposals prior to approval or implementation. An assessment of suitable habitat should be conducted and provided for review.

Response:
The Night Parrot was not discussed in detail in the report as it was considered to be only a vagrant in the area. This was due to the lack of suitable habitat as described in the DBCA (2024) guidelines for the species; so this was considered but not made clear. The guidance describes at length the need for roosting and foraging habitat.

Roosting habitat (spinifex; often long unburnt) was present and widespread, with some areas long unburnt, but such an environment can be found across vast tracts of the country. Foraging habitat is more likely to be limited, and consists of species-rich grasslands and herbfields often associated with paleo-drainage systems. Such landscapes do not occur in the project area or nearby. This is not to say the Night Parrot could never be present, hence the conclusion that it might occur as a vagrant. The definition of 'vagrant' used by BCE is a 'species that occurs within the project area unpredictably, in small numbers and/or for very brief periods. Therefore, the project area is unlikely to be of importance for the species'.