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Iron Valley Project (BC Iron)

Implications of a revised impact footprint upon fauna values and adequacy of existing assessments

Introduction

The Iron Valley Project, owned by BC Iron, was approved in 2012 for above water level mining only, but the proposal has subsequently been modified to include below water level mining. This modification involves some changes that could affect the original assessment of impacts upon fauna:

- The area of direct impact is increased by about 314 ha (an increase of 47%).
- Dewatering of the below water level mine will result in drawdown outside the area of direct impact.
- Dewatering of the below water level mine will result in discharge of water into the nearby Weeli Wolli Creek, with the effect of making water flow in the creek permanent rather than seasonal.
- Dewatering for the Iron Valley project will interact with discharges from upstream mining activities.

In addition to these project changes, there have been some changes to the conservation status of species that need to be considered. These are:
Crest-tailed Mulgara *Dasycercus cristicauda*. Listed under state and federal legislation, but all records of Mulgara in the Pilbara are now considered to be Brush-tailed Mulgara *Dasycercus blythi*. This is considered only to be a Priority 4 species in WA, so is of lesser concern. A Mulgara was recorded immediately adjacent to the project area and some of the environment would provide habitat for the species.
Ghost Bat *Macroderma gigas*. Listed as a Priority 4 species previously but now listed under Schedule 3 (Vulnerable) of the WA Wildlife Conservation Act. Not recorded during field investigations and no primary roosting habitat present, but species likely to be a regular foraging visitor.
Grey Falcon *Falco hypoleucos*. Listed as a Priority 4 species previously but now listed under Schedule 3 (Vulnerable) of the WA Wildlife Conservation Act. Not recorded during field investigations but large trees along Weeli Wolli Creek may provide nesting habitat.
Bush Stone-curlew *Burhinus grallarius*. Formerly listed as Priority 4 but has been de-listed.
Australian Bustard *Ardeotis australis*. Formerly listed as Priority 4 but has been de-listed.

The key significant species identified in the original report were those listed under the EPBC Act, considered likely to be present (or confirmed), and for which impacts might be

significant. These were the Pilbara Olive Python, Crest-tailed Mulgara and Northern Quoll. Of these, only the Crest-tailed Mulgara has changed in that it is no longer considered to occur in the Pilbara, with the Mulgara recorded being the Brush-tailed species. Thus, there are only two EPBC species to be discussed with respect to the revised impact footprint and impacts: the Northern Quoll and the Pilbara Olive Python. Note that while the Pilbara Olive Python was reported by station staff and is very likely to be resident in the area, the Northern Quoll was not recorded and in repeated surveys in the general region (as noted in the original fauna report) it has been found only very infrequently.

Altered area of direct impact

The increased area of direct impact is large relative to the scale of the project (a 47% increase in footprint) but small with respect to surrounding landscapes, and does not affect Vegetation and Substrate Associations not within the approved impact area. There is thus no change in the sorts of fauna habitats being directly impacted and no change in the species likely to be impacted.

The original fauna report calculated the proportion of habitat of key significant species that would be directly impacted, based upon land systems and their representation over a region within 15km of the project area, and upon vegetation types mapped within the overall project area (Table 1). Within the project area, both the Northern Quoll and Pilbara Olive Python rely largely upon the Newman Land System. This is very extensive within 15km of the project area (39,882ha), with 277ha (0.7%) within the approved (above water level) clearing footprint. The revised (below water level) clearing footprint affects an additional 218ha, which brings the proportional impact upon the Newman Land System within a 15km radius to 1.2%. In the case of the Pilbara Olive Python, it may also use the River Land System, with 6367ha within 15km, but none within either the above water level or below water level footprint. Therefore, the proportional habitat loss for the Pilbara Olive Python within a 15km radius of the project area is 0.6% and 1.07% under the above water level and below water level clearing scenarios respectively.

Three vegetation types lie within the project area and will be affected by clearing (Table 1). These do not correspond directly with land systems although Rocky hills and crests are a major component of the Newman Land System, while the Plains correspond closely with the Boolgeeda Land System. The Rocky hills and crests provide habitat for the Northern Quoll and Pilbara Olive Python, while the Creeks and drainage lines provide habitat for the Pilbara Olive Python. Using these vegetation types as an indication of areas of habitat within the clearing footprints, and compared with land systems that provide habitat within a radius of 15km, the proportional habitat loss for each species is low under either scenario:

- Northern Quoll: 278ha and 482ha under above water level and below water level scenarios, representing 0.7% and 1.2% of the Newman Land System within 15km.
- Pilbara Olive Python: 278ha and 482ha under above water level and below water level scenarios, representing 0.6% and 1.04% of the combined Newman and River Land Systems within 15km.

While the area of direct impact does not alter greatly, the greater southern extent of the footprint could disturb a minor drainage line that was considered would provide a movement corridor for the Pilbara Olive Python, allowing animals to move between Weeli Wolli Creek and the rocky hills to the west. This drainage line could be important for the dispersal and movement of other fauna as well and will therefore be retained.

Table 1. Vegetation types within the project area and areas within clearing footprints

Vegetation type	Area of clearing approved under the above groundwater scenario	Additional area for clearing under the proposed below groundwater scenario	Total area for clearing
Creeks and drainage lines	60.1	36.8	96.9
Rocky hills and crests	217.9	167.1	385.0
Plains	351.7	129.0	480.7

Dewatering impacts

Dewatering of the mine and associated discharge have the potential to affect Groundwater Dependent Vegetation (GDVs) and thus the fauna that depend upon these ecosystems, including the Pilbara Olive Python. Therefore, a field and desktop review of the dewatering impacts upon GDVs was carried out by Astron (2015). This considered both the dewatering effects from the Iron Valley project (the Base Case scenario) and the Iron Valley dewatering combined with dewatering from a proposed Rio Tinto Yandicoogina mine expansion upstream (the Rio Tinto scenario). Models of groundwater impacts were applied across the landscape over a 10km radius from the centre of the Iron Valley project and this encompassed 2,542ha of GDV (essentially woodlands of *Eucalyptus victrix, E. camaldulensis* and *Melaleuca argentea*). The model was applied to the end of mining at Iron Valley in 2025.

Modelling by Astron (2015) included assigning a risk to GDV related to changes in groundwater levels (falls or rises). Changes in groundwater levels under the two scenarios were different, with extensive falls (and some rises) in groundwater levels under the Base Case Scenario, but rises (and some falls) in groundwater levels under the Rio Tinto scenario, but the actual area of GDV expected to be at high risk of decline was similar: 591 and 583ha respectively. This represents about a quarter of the GDV within 10km of the Iron Valley mine. Hydrological change is expected to extend to about 6km downstream of the Iron Valley discharge point (Astron 2016), and therefore impacts upon the Fortescue Marshes are not anticipated. The Astron report concluded that the groundwater levels would reach equilibrium within about 10 years of mine closure, and that while some tree death could be expected during this period, recovery of the ecosystem could be expected, especially if dewatering and discharge were reduced progressively to avoid abrupt changes in groundwater levels.

Astron (2015) does not give a figure for the area of GDV that will be directly impacted through clearing, but it is probably very low. Therefore, the risk of change to about 25% of GDV within 10km of the Iron Valley mine represents a large change from the impacts of the original mining proposal (above water level mining only). The GDV is likely to support Pilbara Olive Pythons and large riverine eucalypts may also provide habitat for Northern Quoll. The GDV is also likely to be generally rich in fauna species but was not included in the original fauna assessment as the GDV lay outside the areas of direct or indirect impact (Everard *et al.* 2012).

The almost 600ha of GDV at high risk of decline will not be cleared but will be modified by vegetation deaths, altered vegetation composition and changes in soil moisture. The GDV

will change again when discharge ceases. Such changes will have both adverse and positive effects on the fauna assemblage. Olive Pythons may be robust in the face of predicted changes, as they can shelter in living or dead trees and feed on a range of animals. There may be a change in the proportional representation of some other species in the assemblage as a result of changes in their local pattern of distribution. Species associated with moist conditions could expand their local distribution at the expense of more arid-adapted species; and *vice versa*.

A concluding remark in the Astron (2015) executive summary is important to consider:

"…it appears possible that current and future disposal of water from Rio Tinto's mining operations could mitigate any potential negative impacts of drawdown from the Iron Valley Project along the southern (upstream) portion of the Weeli Wolli Creek system. However, discharge from the Iron Valley Project may potentially lead to an additional discharge impact along the mid to northern (downstream) portion of the Creek, which could be either positive in some areas and negative in others depending on species, spatial distribution of vegetation in the creek bed and surrounding areas, and tolerance to inundation and waterlogging."

This is effectively saying that the greatest changes may be restricted to north (downstream) of the Iron Valley mine and are likely to involve increased groundwater levels and increased surface water. This may adversely impact some species but may benefit others, probably including the Olive Python that is often associated with mesic environments.

References

Astron (2015). Iron Valley Groundwater Dependent Ecosystem Investigation. Unpubl. report prepared for BC Iron.

Everard, C., Bamford, M., Huang, N. and Gamblin, T. (2012). Vertebrate fauna assessment of the Iron Valley Project Area. Unpubl. report to Iron Ore Holdings, prepared by Bamford Consulting Ecologists, Kingsley.