Professional opinion on the affects on Tropicana Gold Project on marsupial moles conservation in regard to fragmentation of the marsupial moles population

Joe Benshemesh November 2009

The Itjaritjari (*Notoryctes typhlops*; Southern Marsupial Mole) is a poorly known species that is classified as Endangered under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*, and in WA as "Fauna that is rare or is likely to become extinct" under Schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2003.* The species is widely distributed in GVD (Benshemesh and Schulz 2008) and is known to occur in the Tropicana Gold Project (TGP) area where *ecologia* Environment consultants recorded signs of its occurrence in about 50% of trenches excavated within 5km of the proposed mine site (*ecologia* Environment 2009).

In a report on the distribution of marsupial moles in the WA Great Victoria Desert (GVD), Benshemesh and Schulz (2008) remarked on the potentially damaging affects of large scale earthworks on marsupial moles populations, especially if such earthworks interrupted the movements of animals and fragmented the population. These comments reflected the finding of our study in which signs of Itjaritjari were found to be generally widespread across the GVD but conspicuously absent from most isolated dunes we sampled. We interpreted this result as suggesting that Itjaritjari requires continuous dunes systems to disperse and colonise new habitat, and that small, isolated populations are probably untenable in the long term. We concluded that this sensitivity may also make marsupial moles vulnerable to changes in the configuration and connectivity of dunes that result in small patches of dunes being cut off and isolated from the surrounding dunefield matrix. In short, the affects of major earthworks could extend well beyond the footprint of disturbance if linkages between populations were severed.

While our comments in Benshemesh and Schulz (2008) were of a general nature, here I consider the likely affects on marsupial mole populations of the current proposal to construct the TGP, particularly in regard to permanent landscape changes associated with the mine, and new roads, that may disrupt the continuity of the marsupial moles population.

Permanent features

The most detrimental landscape changes associated with the proposed Project include the pit, tailings dams and waste landforms. These features are likely to permanently change the local landscape and destroy dunes that are known to be marsupial mole habitat. Plans for the TGP (Figure 1) suggest that permanent changes such as the pit, tailing dams and waste dumps will occupy and area of no more than 25 km^2. This area is known to support Itjaritjari (*ecologia* Environment 2009) contains about 15km of dunes that represent Itjaritjari habitat. The immediate affect of these landscape changes on Itjaritjari conservation will be the loss of habitat and individuals to the population, but of potentially even greater concern is that earthworks at this scale may fragment the local population. These concerns are addressed below:

Habitat loss

While the loss of habitat and individuals is regrettable and should be minimised wherever possible, it is unlikely that this loss caused by the Project will significantly threaten the larger population. The dunefields south of Lake Rason are not obviously connected to the rest of the GVD (Figure 2 and 3) and may represent a sub-population of marsupial moles (Benshemesh and Schulz 2008) which, if true, would make the marsupial moles in this area more susceptible due to its smaller population size. However, the available habitat south of Lake Rason is nonetheless substantial (estimated at about 14,000 km of dune; Benshemesh and Schulz 2008) and the 15 km of dune that may be destroyed by the mine represents less than 0.1% of this habitat, and less than 0.01% of available habitat in the WA GVD. Although the actual population size of Itjaritjari in this area is still difficult to estimate, it is unlikely that a change in population size of this scale would jeopardize the conservation of the species.

Fragmentation of larger population

The loss of habitat at the proposed TGP site is unlikely to jeopardise the conservation of marsupial moles in surrounding areas. While habitat links are likely to be of great importance in some areas, there is nothing to suggest that the Project area provides an important link to surrounding areas and populations (Figure 2 and 3). In fact, the Project area is at the eastern edge of the dunefields and appears to be a cul de sac rather than a potential conduit. Thus, it is unlikely that the loss of this area for marsupial moles would have consequences beyond those associated with the loss of individuals to the population.

Roads

The proposed Project will involve the construction of roads from population centres, such as Kalgoorlie, and associated construction, habitat removal and traffic may have short and long term affects on marsupial moles populations. These affects are unlikely to compromise the conservation of Itjaritjari in the region for the following reasons:

1. Dunes appear to have been specifically avoided in the proposed routes for roads, and for most of their length it would appear that the proposed roads follow swales. This will benefit Itjaritjari and is preferable for road construction.

2. There is no evidence that traffic noise/vibrations provides a major difficulty to Itjaritjari: Itjaritjari tunnels have been detected along side railway lines that have carried several trains a day for many decades, and occurred at similar densities to locations more than one kilometre away from the railway (Benshemesh 2005), suggesting that the species is not especially sensitive to periodic noise and vibration. There is no reason to suppose that there will be major deleterious affects on marsupial moles living adjacent to increased traffic on roads. Nonetheless, it would seem wise to monitor these effects.
3. The roads disturbance will be relatively narrow (up to 20m) and for much of their length would probably still be passable for Itjaritjari that attempt to travel on the surface from one side of the road to the other.

4. The proposed roads are temporary. Under current permits, I understand that access roads will be will be removed and habitats rehabilitated when the mine is closed. Thus, even if the roads were to present a barrier to marsupial mole movement, this barrier would be removed within 15-20 years. This is a relatively short period of time considering that the available habitat on either side of the proposed roads is extensive and totals several thousand kilometres of dune habitat.

While the proposed roads are currently planned to be temporary, it is possible that government authorities may eventually choose to retain the roads after the mine has closed. If this is the case, the likely impacts of a permanent road on marsupial moles in the area should be reviewed in the light of 1) the results of studies on the conservation ecology of marsupial moles that are currently underway, and 2) in regard to marsupial mole monitoring results from the areas in question (I presume monitoring would occur concurrently with the Tropicana Gold Project).

Conclusion

The operations at the proposed Tropicana Gold Project is likely to permanently destroy or damage about 15km of dunes and this will be concomitant with the loss of marsupial moles and their habitat in this area. However, this loss is not likely to threaten the conservation of the species either locally in the surrounding areas, or globally. The construction and use of temporary roads may cause further deleterious effects on marsupial moles, but these are likely to be are of less concern as few dunes will be destroyed and because these landscape disturbances will be rehabilitated within a few decades.

Given the scale of both the proposed project and the deleterious impacts on this species, it would seem likely that whatever damage is caused by the mine could be compensated by positive actions aimed at improving or at least clarifying the conservation concerns of the species, and that a net benefit rather than loss for conservation is feasible.

References

Benshemesh, J. (2005) Marsupial mole survey of the Yellabina and Yumbarra Conservation reserves, lower Great Victoria Desert, SA. Department of Environment and Heritage, Adelaide.

Benshemesh, J. & Schulz, M. (2008) Survey of the underground signs of marsupial moles in the WA Great Victoria Desert. Report to AngloGold Ashanti Australia (Perth) and the Department of Natural Resources, Environment and the Arts, Northern Territory Government (Alice Springs). (http://www.tropicanajv.com.au/IRM/Company/ShowPage.aspx?CPID=938&EID=77285011)

Ecologia Environment (2009) Tropicana Gold Project Operational Area Fauna Assessment. Unpublished report to AngloGold Ashanti Australia, 20 July 2009. (http://www.tropicanajv.com.au/IRM/Company/ShowPage.aspx?CPID=908&EID=92694374)

Figure 1. Tropicana Gold Project proposed Operational Footprint (black polygon) in relation to dunes (red).

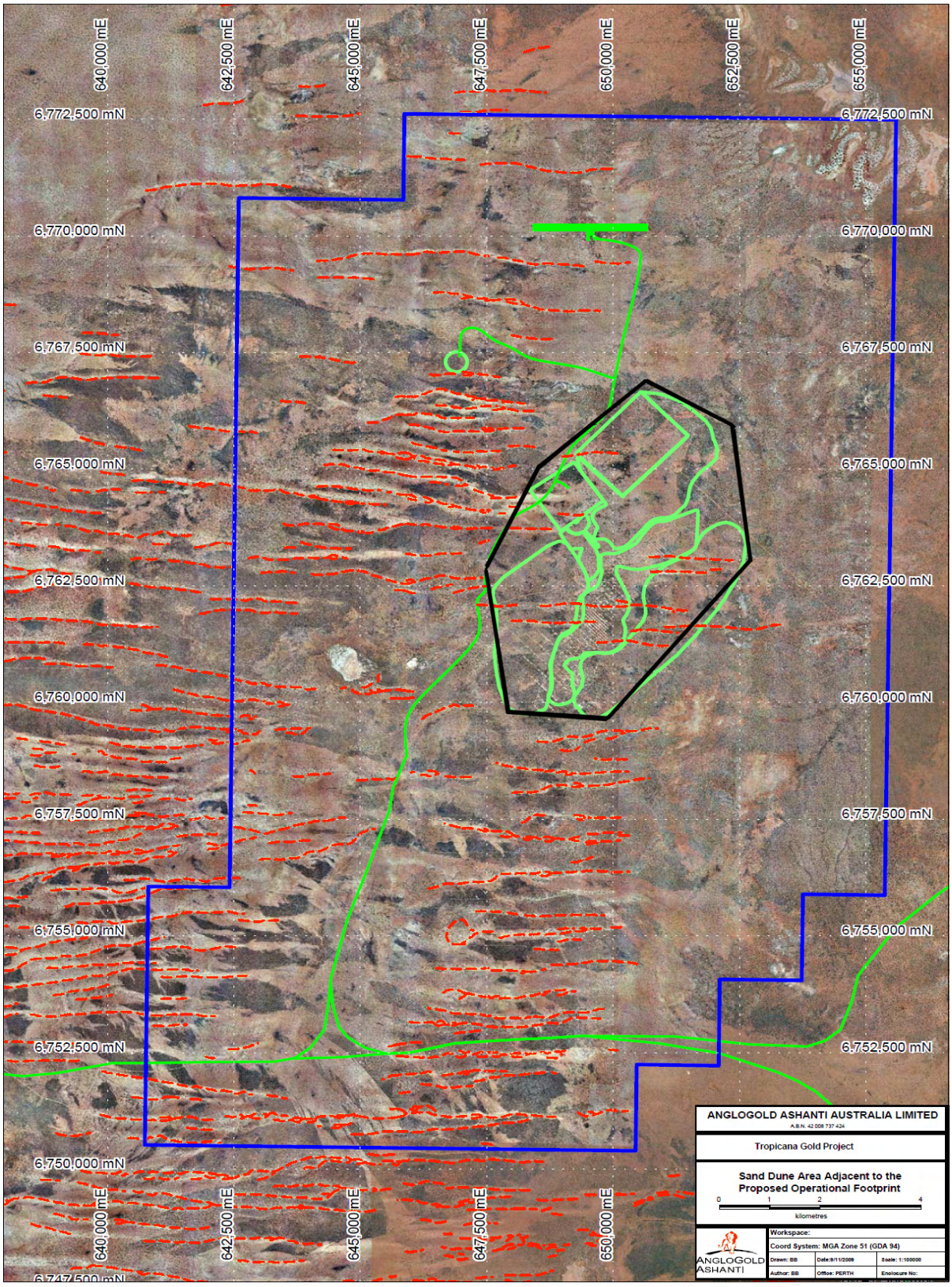

Figure 2. Tropicana Gold Project in relation to the larger context, showing the Great Victoria Desert dunefields (red). At the centre of the image the blue rectangle and the black polygon within it relate to the blue rectangle and the black polygon in Figure 1. Roads and tracks are shown as green lines, and the yellow circles show the sampling points for the regional marsupial mole survey (Benshemesh and Schulz 2008).

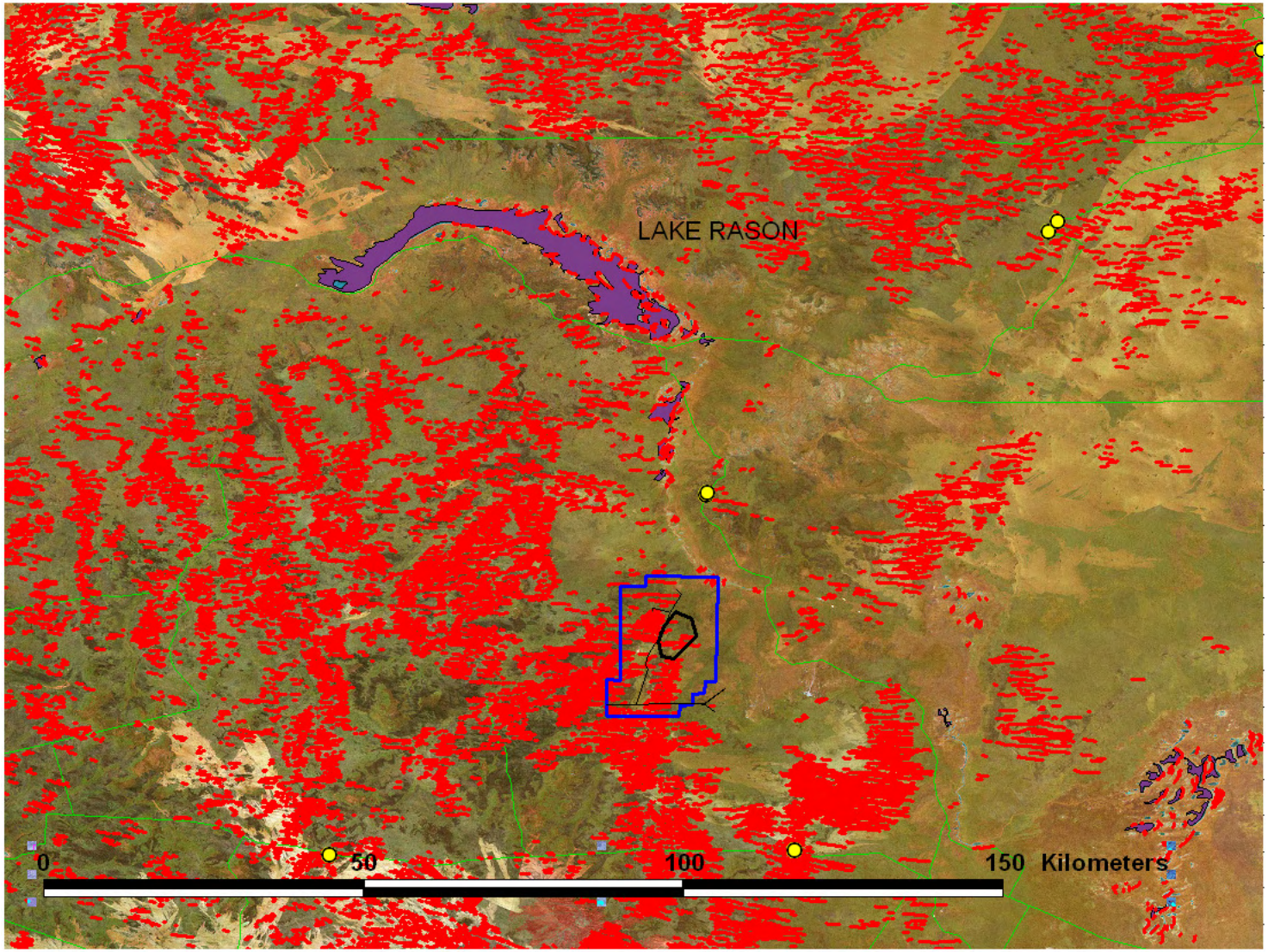

Figure 3. Tropicana Gold Project in relation to the larger context, showing the Great Victoria Desert dunefields (red). At the centre of the image the blue rectangle and the black polygon within it relate to the blue rectangle and the black polygon in Figure 1. Roads and tracks are shown as green lines, and the yellow circles show the sampling points for the regional marsupial mole survey (Benshemesh and Schulz 2008).