CONSERVATION OF CHUDITCH ON MINING LEASES IN THE JARRAH FOREST

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Introduction

The Chuditch, *Dasyurus geoffroii*, is one of four Quoll species in Australia. It belongs to the family of carnivorous marsupials which also includes the marsupial mice or Dunnarts, and the Tasmanian Devil. Like many of Australia's medium sized mammals it's range has declined drastically over the last 150 years. At the time of European settlement the Chuditch occurred across Australia in every mainland State and the Northern Territory. However, by the 1960s it was restricted to only the south west of Western Australia and is now found at low densities throughout the Jarrah forest and adjacent woodlands. It is probably still declining in the eastern parts of the wheatbelt. Reasons for the decline of this species include predation by foxes and feral cats, clearing of large areas of suitable habitat, and loss of suitable prey items.

In 1983 the Chuditch was declared a threatened species in WA, and in 1991 it was included on the the ANZECC (Commonwealth) list of Threatened fauna. A Recovery Plan was prepared in 1992 (Orell and Morris 1994), and with support from CALM, the Australian Nature Conservation Agency, World Wide Fund for Nature, Perth Zoo and Alcoa this is now being implemented. Bauxite mining in the Jarrah forest has the potential to reduce Chuditch abundance in the Jarrah forest and woodlands through accidental death (roadkills etc), the loss of secure refuge sites and dietary biodiversity. However with appropriate management and rehabilitation procedures, Chuditch populations, and those of other medium sized mammals, can be enhanced in these mined areas. Prior to the arrival of the fox, Chuditch were abundant and ranged throughout cleared farmland and other disturbed habitats. Providing foxes are controlled and the shelter and food requirements can be met there are no reasons why Chuditch should not persist in mining leases within the Jarrah forest.

This paper discusses the issues of rehabilitation, fox control and prescribed burning regimes and how they may be implemented to enhance Chuditch populations in bauxite mining leases.

Rehabilitation of minesites

Chuditch are known to occur on bauxite mining leases within the Jarrah forest. The recovery plan identifies three actions necessary to ensure that Chuditch recolonize disturbed mined areas as quickly as possible. Most of my comments relate to the provision of den sites, however the other two aspects are also important for Chuditch persistence.

a) Provision of den sites in rehabilitated sites.

Chuditch use up to 160 dens in a year. Approximately half of these are hollow logs and half are burrows, however Chuditch are opportunistic and these ratios will vary depending on what is available. Placing den sites in rehabilitated pit areas at a rate of approximately one per hectare

and at least 100 m from the edge of the pit, will provide refuge sites initially for smaller prey items such as large invertebrates, rats and reptiles and later for larger mammals such as possums and Chuditch. Use by Chuditch will probably not occur until the vegetation has attained a reasonable height and density, perhaps after five years. A monitoring program should be implemented to assess this.

Den sites need to be of specific dimensions to be of use to Chuditch. **Hollow logs** must be >50cm diameter a nd at least 2m in length. The hollow should be well formed and 7 - 20cm in diameter. Ground logs with these dimensions should be sought during preparatory clearing for mining and stockpiled at the side of the mined area for later redistribution. One or two hollow logs at each site is sufficient.

Burrows can be provided by piling large (0.5 - 1.0m diameter) rocks, stumps and logs (3m long x 0.5m diameter) together and covering with soil. Cavities are formed within this structure and Chuditch and other fauna are able to dig into them to gain access. These structures should be no less than 3m long, 2m wide and 1.5 m high. The materials for these dens should also be stockpiled prior to mining and redistributed during the rehabilitation process. Small vertebrates will start utilizing these sites soon after establishment.

The spreading of **smaller rock piles and logs** around the rehabilitated area will also promote the return of invertebrates and smaller vertebrates on which Chuditch feed. Using this debris to link forested patches within minesites is useful. Overall the aim should be to make the rehabilitated area look as untidy as possible, rather than clearing away or burning the stockpiled log, stump and rock debris. In the forest the ground is littered with fallen logs and rocks and rehabilitated areas should try to mimic this.

b) Development of moderately dense vegetation and deep ground litter in rehabilitated sites.

Use of a mixture of fast growing and slower growing plant species is desirable. The faster growing species are usually not long lived and fall down after 3-5 years providing excellent ground litter .

c) Use of techniques that encourage rapid development of prey biomass.

Spreading of stockpiled topsoil together with bark and other debris will enhance the return of prey items from adjacent forested areas.

Fox Control

It has been demonstrated that where the fox is controlled in the Jarrah forest, Chuditch abundance increases (Morris, Orell and Brazell 1995). Other medium sized mammals such as Quenda, Woylie and Brushtail Possum also respond positively. Fox control on mine sites in the Jarrah forest is an important operation for the conservation of Chuditch in these areas.

Dried meat fox baits containing 4.5mg 1080 (may be reduced to 3.0 mg later) should be distibuted at a rate of 5 baits per square kilometre every three months to be effective. Frequency of baiting is is particularly important in isolated areas of forest surrounded by farmland where fox numbers are higher. Smaller areas (< 15 000ha) are probably more efficiently baited by vehicle, whereas larger area from the air. It is important for any baiting program to ensure that all the appropriate notifications are made to neighbours and public signs erected.

Prescribed Burning

Prescribed burns in either spring or autumn are used by CALM throughout the forest to reduce forest litter loads. Chuditch are known to have survived in forests areas that have been spring and autumn burnt and research is presently underway to determine the impact of these fires on Chuditch. It has been shown at Batalling that Chuditch were not detrimentally affected by a cool, patchy spring burn covering about 5 000 ha. This was at a time when females had young in den logs, however the low intensity of the fire resulted in very few logs being destoyed. Chuditch abundance was not reduced by this fire. It should be pointed out however that this burn was atypical of many of CALMs spring burns in that it was very patchy (approximately 50 % unburnt in some areas, and small in extent).

I believe that smaller (5 000ha) patchy, cool burns have little impact on Chuditch. Unburnt areas provide refuges for prey species and den logs remain unburnt. Cool autumn burns (if possible) are probably preferable as Chuditch do not have dependent young at this time and would be more able to avoid an approaching fire. A heterogeneous environment comprising unburnt areas and areas burnt in spring and autumn probably suit Chuditch. These regimes will suit different prey species at different times and the Chuditch's mobility over large movement areas enables them to exploit this.

Workforce Awareness

Increasing workforce awareness about Chuditch conservation will enhance all of the above actions. Staff with an understanding of the conservation issues and why certain actions are required are more likely to undertake the work efficiently and effectively. Accidental deaths of Chuditch can also be reduced with an informed workforce.

References

Morris K. D., Orell P., and Brazell R. (1995). The effect of fox control on medium sized mammals in the Jarrah forest, Western Australia. *Proceeding sof the 10th Vertebrate Pest Control Conference*, Hobart. May 1995.

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