DRAFT

A review of the conservation status of the Chuditch *Dasyurus geoffroii* (Marsupialia: Dasyuridae) using IUCN criteria.

by

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1. Introduction

At the time of European settlement, the Chuditch (*Dasyurus geoffroii* Gould 1844) occupied nearly 70 percent of the Australian continent, occurring in every mainland State and Territory. It was relatively abundant at this time (Collett 1887, Whittell 1954, Johnson and Roff 1982, Burbidge et al 1988), however a drastic decline of range has occurred over the last 200 years. Specimens were last collected in New South Wales in 1841, Victoria in 1857 and Queensland between 1887-1907. Chuditch were last reported in the central arid zone in the 1950s (Finlayson 1961) and on the Nullarbor in the 1930s (McKenzie and Robinson 1984). In Western Australia, the species was last collected in Shark Bay in 1858, although there is an unconfirmed record of Chuditch along the Gascoyne River (McKenzie *pers comm*). It was still abundant in the south west in 1907 and persisted on the Swan Coastal Plain until the 1930s. Chuditch are now confined to the south west part of Western Australia, occupying a roughly triangular area bounded by Moora in the north, Cape Arid to the east and Cape Leeuwin in the south. Largest populations occur in the Jarrah (*Eucalyptus marginata*) forests and woodlands. There are also records from drier woodlands and mallee shrublands in the wheatbelt.

In 1983 the Chuditch was listed as a threatened species under the WA *Wildlife Conservation Act* 1950, and in 1991 it was listed as a Endangered species under the Commonwealth *Endangered Species Protection Act* 1992. The Action Plan for Australasian Marsupials and Monotremes listed Chuditch as Endangered (Kennedy 1992), however a revision of this plan in 1996 regarded the Chuditch as Vulnerable using IUCN (1994) criteria (Maxwell *et al* 1996).

A wildlife management program for Chuditch was published in 1991 (Serena *et al* 1991) and this formed the basis for preparation of a draft recovery plan for the species. This plan was subsequently revised and published in 1994 (Orell and Morris 1994). Since 1992 implementation of the Chuditch recovery plan has been supported by CALM, Alcoa, Perth Zoo and Environment Australia. The objective of this recovery plan was to downlist the Chuditch from Endangered to Vulnerable within 10 years (by 2001). Criteria for success were:

1. Average daily trap success rates at monitoring sites in the Jarrah forest remaining at or increasing above 1%.
2. Maintenance of a population in at least one semi arid monitoring site.
3. At least one self sustaining population established outside present range.

Substantial progress has been made on the recovery of Chuditch since 1992 and this document assesses its current conservation status using the IUCN (1994) criteria.

2. Assessment using IUCN (1994) criteria

The IUCN Red List Categories recognise two extinct categories (Extinct, and Extinct in the Wild), three threatened categories (Critically Endangered, Endangered and Vulnerable) and three lower risk categories (Conservation Dependent, Near Threatened, and Least Concern). Within each of the Threatened categories, there are five areas (2.1 – 2.5 below) against which the species can be assessed. It needs to met the criteria in at least one of these areas to be regarded as threatened. In the following analysis I assess the Chuditch against the areas of the lowest of the threatened categories, Vulnerable.

2.1 *Substantial past or projected future decreasing population trends.*

For Chuditch to qualify as vulnerable, there must have been a reduction in population size of at least 20 per cent over the last ten years, or a projected reduction of 20 percent in the next ten years. A summary of Chuditch abundance (using trap success as a measure) before fox control (four baitings per year) commenced, and in 1998 is shown in Table 1.

Site	Pre fox control trap success	Date fox control commenced	1998 trap success	source
Batalling	0.2-0.5 %	1991	4.5 – 5.5 %	Morris
Kingston	0.3-0.7 %	1994	1.5 – 4.4 %	Morris, Wayne
Perup	0.4 – 0.7%	1981	1.5 – 2.5 %	Burrows
Mundaring	0	1996	2.3 – 2.7 %	Carter
Julimar	0	1991	4.3 %	Morris, Carter
Lake Magenta NR	0.1%	1996	0.6-2.1 %	Morris, Johnson
Northern Jarrah Forest	0.1 – 0.5%	1994		Serena, deTores

Table 1. Chuditch trap success rates before and after fox control.

Based on trap success rates, the population trend since fox control commenced has been increasing, not decreasing. Chuditch would not qualify for Vunerable status on this criterion.

2.2 *Extent of occurrence and areas of occupancy.*

To qualify as vulnerable, Chuditch will have to have an extent of occurrence of less than 20 000 km^2 or an area of occupancy of less than 2 000 km^2, and two out of three additional criteria relating to severely fragmented populations, continuing decline and extreme fluctuations in abundance.

Chuditch presently have an extent of occurrence stretching in a roughly triangular shape from Moora in the north, Cape Arid in the east and Cape Leeuwin in the south. This is an area of approximately 360 000 km^2, so the Chuditch clearly does not qualify for Vulnerable under this criterion. Area of occupancy is more difficult to assess, however if the Chuditch population in the Jarrah forest is regarded as more or less continuous, this area of

occupancy alone is approximately 1 000 000 ha, or 10 000 km^2. Again the Chuditch would not qualify for Vulnerable under this criterion.

2.3 *Population size (for larger populations) and predicted decreasing trends.*

To qualify as Vulnerable, the total number of Chuditch would need to be less than 10 000 individuals, with an estimated continuing decline of at least 10 per cent in 10 years, or a continuing decline in the number of mature individuals or population structure.

In the 1980s the Chuditch population in the Jarrah forest was estimated at between 2500 – 4400 individuals (Serena *et al* 1991). Perhaps another 1 500 persisted in semi arid areas. At this time trap success rates at Jarrah forest sites such as Batalling and Perup were approximately 0.5 per cent. Following fox control these trap success rates have increased to between 2.5 and 5 per cent. Conservatively there are probably now five times, or approximately 12 500 Chuditch in the Jarrah forest and probably a further 2 000 in the wheatbelt. Another 50 – 100 are housed at Perth Zoo. Populations are predicted to increase, not decline,over the next 10 years with the continuation of broadscale fox control programs in the south west. There may be some fragmentation of populations in the Jarrah forest, however these are expected to become continuous as abundance increases as a result of fox control. Populations in the wheatbelt may remain fragmented for longer until fox control and revegetation becomes more effective off conservation estate in rural areas.

Chuditch does not qualify as Vulnerable under this category.

It should be noted that in the 1996 assessment of this species for the Action Plan for Marsupials and Monotremes (Maxwell *et al* 1996), Chuditch did qualify for Vulnerable under this category. At this time its population size in the Jarrah forest was not considered to be above 10 000 individuals and populations in the wheatbelt were probably still declining.

2.4 *Population size (of smaller populations) irrespective of population trends.*

To qualify for Vulnerable under this category, Chuditch populations need to be very small (< 1 000 individuals), acutely restricted in area of occupancy (< 100 km^2), or number of locations (< 5). Data presented above clearly indicate that Chuditch can not be classified as Vulnerable under this category.

2.5 *Quantitative analysis showing probability of extinction in specified time units of generations.*

To qualify as Vulnerable this category requires a quantitative analysis showing the probability of extinction is at least 10 per cent within 100 years. No analysis has been undertaken for Chuditch. However, given the population size and trends discussed above, a PVA is unlikely to show a significant probability of extinction. Assuming that current available habitat is not altered to become unsuitable for Chuditch and current predator control programs are continued, there is no reason to believe that populations will not continue to increase in distribution and abundance.

3. Assessment using Recovery Plan criteria.

3.1 *Average daily trap success rates at monitoring sites in Jarrah forest remaining at or increasing above 1 per cent.*

The data presented in Table 1 indicates that trap success rates for Chuditch in the Jarrah forest in 1998 are above 1 percent and Figures 1 – 4 show that these trap success rates

have been maintained for several years. (NJF SITES??). This criteria for recovery success has been achieved.

3.2 *The maintenance of a population in at least one semi-arid monitoring site.*

No suitable naturally occuring populations of Chuditch could be found in the wheatbelt for monitoring. In November 1996 Chuditch were translocated to Lake Magenta Nature Reserve and this population has been monitored since. Trap success rates at Lake Magenta are shown in Table 2.

	Trap success
June 1991	0.1 %
June 1994	0
Nov 1997	2.1 %
Feb 1998	1.3 %
May 1998	0.6 %

Table 2. Chuditch trap success rates at Lake Magenta Nature Reserve.

At this time there have been two breeding seasons at Lake Magenta, and breeding is known to have occurred. However, Chuditch abundance has not yet stabilised and it could not be concluded that this population is being maintained until further monitoring has been completed in 1999. In February 1998, Chuditch were translocated to Cape Arid National Park, however it is too early to determine whether this population is being maintained. This recovery criteria has not been met.

3.3 *At least one self-sustaining population established outside present (1994) range.*

No translocations have been undertaken to sites outside present range. It is proposed to translocate Chuditch to Francois Peron National Park in 2001. Clearly this recovery criteria has not been met.

4. Conclusions

While two out of the three recovery criteria for success have not been met, the Chuditch currently (1998) does not meet the IUCN criteria for the threatened status of Vulnerable. The recovery plan objective was to downlist the Chuditch to Vulnerable by 2001. This objective has been exceeded and the Chuditch could now be regarded as a Lower Risk species using current population and abundance data. However under the IUCN rules for moving tax from a category of higher threat to a category of lower threat, the lower threat criteria must have been met for five years before the change is made. Chuditch would not have met the LR criteria in 1993, as broadscale fox control did not commence in the Jarrah forest until 1994 and in the wheatbelt until 1996. Chuditch should continue to be regarded as Vulnerable until this "five year rule" is complied with.