CHUDITCH RECOVERY TEAM

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by

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SUMMARY

This report covers the second year of implementation of the Chuditch recovery plan. Financial support continued from ANCA's Endangered Species Program and the World Wide Fund for Nature (utilising a grant from Alcoa) and good progress has been made on several actions. The trial into the effects of fox baiting on Chuditch in the jarrah forest has been completed, demonstrating that fox control enhances the conservation of Chuditch, as well as other forest mammals. In fox baited areas, population densities approximately three times that of unbaited forest have been achieved for Chuditch. It will now be possible to commence broadscale fox control in the jarrah forest. The translocation of Chuditch to Julimar Conservation Park has also been successful with most animals surviving, establishing home range areas within six weeks and breeding in the first year. There was some evidence of cat predation at Julimar and this may be a potential problem for translocations of Chuditch to semi arid areas. CALM is now proceeding with its plans to reconstruct the mammal fauna of this area with re-introductions of Brushtail Possums, Woylie and Quenda. The captive breeding program was successful in 1993 with 20 young born to five females. These will be used for a translocation to the Bindoon military training area, north of Julimar. The recovery plan was revised during 1993 to reflect changes to the recovery criteria regarding the necessity to monitor semi arid populations. Changes to actions relating to the site of the first translocation, assessing the impact of prescribed burning, monitoring in semi arid areas and captive breeding were also made.

INTRODUCTION

In November 1991, a recovery plan for the Chuditch *Dasyurus geoffroii*, was prepared (Orell and Morris 1991) and its implementation jointly funded in 1992 through the Australian Nature Conservation Agency (ANCA) Endangered Species Program (ESP) and a grant from Alcoa (via WWF Australia). The Department of Conservation and Land Management (CALM) and the Perth Zoo also contribute. This recovery plan was based on a management program for the Chuditch prepared earlier by Serena *et al* (1991).

The recovery plan indicated that the following actions were necessary to ensure the conservation of the Chuditch:

1) Integration of Chuditch habitat requirements into forest management practices.

2) Development and application of fox control programs that are `Chuditch safe'.

3) Monitoring of representative Chuditch populations and habitat.

4) Further research into Chuditch distribution and habitat requirements in semi arid areas, and disease.

5) Captive breeding to provide animals for translocations.

6) Development of techniques for translocating Chuditch into areas of vacant, suitable habitat.

These actions were to be implemented over 10 years and result in a downlisting of conservation status (ANZECC) from Endangered to Vulnerable through:

a) maintaining or increasing population densities at monitoring sites in the Jarrah forest, and
b) establishing one self sustaining population outside the present range.

RECOVERY TEAM

A recovery team was established to oversee and coordinate the implementation of the recovery plan. This comprised:

Mr Keith Morris (Chair),	CALM Woodvale.
Mr Peter Orell	CALM Woodvale.
Dr Andrew Burbidge	CALM Woodvale.
Ms Sally Stephens	ANCA, ESU Canberra.
Dr Ray Nias	WWF, Sydney.
Mr Gordon Wyre	CALM Como.
Mr John Gardner	Alcoa of Australia Ltd.
Mr Bob Hagan	CALM Manjimup.
Mr John Skillen	CALM Bunbury.
Mr Paul Brown	CALM Kelmscott.
Mr David Mitchell	CALM Narrogin.
Mr Graham Hall	Perth Zoo.

During 1993, Mr Paul Brown replaced Ms Jeni Alford as the Swan Region representative and Mr Graham Hall replaced Mr Darryl Miller as the Perth Zoo representative on the recovery team.

The recovery team met twice in 1993; once on 28 July and again on 14 December.

RECOVERY PLAN STATUS AND FUNDING

Financial support for implementation of the Chuditch recovery plan continued in 1993 from ANCA's Endangered Species Program, WWF Australia (grant from Alcoa of Australia Ltd), CALM and Perth Zoo. A revision of the recovery plan occurred during 1993 to reflect amendments to the recovery criteria and variation in the implementation of some of the recovery actions.

The recovery plan initially provided only for monitoring in the Jarrah forest as a measure of recovery success. As the Chuditch is still sparsely distributed in semi arid areas to the east of the Jarrah forest, it was considered necessary to include a monitoring aspect for judging success in this area as well. Consequently, an additional criterion was included:

> Maintenance of a population at densities determined by initial survey in at least one semi arid monitoring site.

Changes to some of the recovery actions were also made. These are detailed in the revised recovery plan (Orell and Morris 1994) and related to:

a) Modification to the research into the effects of prescribed burning on chuditch.

b) Undertaking a trial translocation to Julimar Conservation Park before attempting a semi arid translocation.

c) The need to monitor and manage at least one semi arid chuditch population.

d) Extending the captive breeding program at the Perth Zoo from 1996 to 2000 to facilitate the breeding of semi arid chuditch for translocation.

e) The incorporation of research into disease and parasites into a health monitoring program at the Perth Zoo.

These changes will result in an increase in total funds sought from the Endangered Species Program from $780.4 K to $895.8 K over 10 years. This increase is due almost entirely to the extension of the captive breeding program from 1996 to 2000. All other action changes have been accommodated within the existing budget.

Results of recovery actions relating to fox control, trial translocation to Julimar, and jarrah forest monitoring will be appended to the revised recovery plan. The revised recovery plan will be completed by mid-January 1994 and forwarded to CALM's Corporate Executive and to funding agencies. It is anticipated that the recovery plan will be published as a CALM Wildlife Management Program in 1994.

RECOVERY PLAN ACTIONS - Progress in 1993.

(reference numbers 3.1 etc. refer to numbers in recovery plan)

3.1 Habitat Management:

3.1.1 Research into the effects of prescribed burning regimes on chuditch:

The Batalling forest block, east of Collie was selected for this research. The siting and timing of the three treatments to be imposed (a spring 1994 burn, an autumn 1995 burn and no burning) was determined. Each treatment will be replicated and effects on the other medium sized mammals in the forest examined. Pre-fire mammal population data were collected during two trips.

3.1.2 Maintenance of adequate refuge and den logs:

3.1.2.1 Effectiveness of silvicultural guidelines:

Research into the effects of timber harvesting on chuditch and other medium-sized forest mammals has been integrated into a study examining the responses of all vertebrate fauna and vegetation to three logging treatments. During 1993 research plans were developed and have now been finalized. The location of this trial at Kingston forest block east of Manjimup, and the treatment sites were also determined. Fox baiting was commenced in the area in May 1993, and preliminary surveys indicate that populations of chuditch, woylie, quenda, brushtail possum, and ringtail possum are present and increasing in size in response to the fox baiting. The first logging will occur in January 1995, allowing approximately 12 months to obtain pre treatment population and habitat requirement data.

3.1.2.2 Assess importance of artificial den sites:

No action undertaken, but see 3.1.3 below.

3.1.2.3 Assess the effect of commercial firewood collecting:

No action planned until 1997, although it may proceed in 1994.

3.1.3 Rehabilitation after surface mining:

During 1993, Alcoa of Australia Ltd. conducted trapping programmes for medium-sized mammals at all minesites. One Chuditch was sighted in a four year old rehabilitated area. No Chuditch were trapped, despite relatively large trap efforts in Jarrahdale rehabilitation (714 trapnights), and in unmined forest at Jarrahdale (888 trapnights), Huntly (714) and Willowdale (742). A trapping programme conducted by CALM Harvey staff at Willowdale minesite in August trapped two Chuditch from 902 trapnights (0.2 % trap success). For both Jarrahdale and Huntly, these results represent a decline from earlier surveys conducted between 1978-82. Trapping programmes for the 1993 surveys included sites both close to and remote from mining operations. When considered in conjunction with results from fox baited areas at Batalling, it is possible that fox predation was a major factor in the decline of Chuditch and other medium-sized mammals.

Alcoa staff continued to evaluate and develop dens and corridors constructed in rehabilitated areas from logs and rocks, and designed to provide shelter for Chuditch and other mammal and reptile fauna. A survey showed that Mardos and reptiles use these structures, as do Black Rats and foxes. The study concluded that the structures probably had some value, but in the presence of foxes, it was difficult to fully evaluate their worth.

3.1.4 Clearing of habitat:

The construction of a dam in the jarrah forest for the Margaret River water supply was commenced in February 1993. Prior to this, a fauna survey of the 40 ha area to be disturbed and flooded was undertaken by a consultant. No chuditch were found although this area probably formed a small part of the home range of at least one chuditch. It was considered that this development would have no significant impact on the chuditch population in the area.

3.1.5 Public education and forest traffic management:

Public education signs incorporating information about chuditch were erected at the Honeymoon Pool campsite, on the lower Collie River in 1993. A draft road warning sign design was prepared but needs modification before production. Road kill and sighting reports of chuditch have continued during 1993. One of the more interesting was a sighting in the Walpole-Nornalup National Park where chuditch had previously not been recorded.

3.2. Research into the effects of the fox and fox baiting programs on Chuditch:

Monitoring of chuditch populations in baited and unbaited forest blocks east of Collie has been continued in 1993. Trap success results are shown in Table 1. Pre-baiting monitoring data since 1982 was also available for Chuditch in this area.

Table 1. Summary of chuditch trap success rates in jarrah forest baited for fox control and unbaited at Batalling.

Month / Year	Unbaited forest (% trap success)	Baited forest (% trap success)
July-Sept 1982	1.6	
July- Sept 1983	1.4	
Jan-March 1984	1.3	
July-Dec 1985	0.6	
July-Dec 1986	0.3	
December 1990	0.4	
March 1991		4.0
July 1991		2.5
November 1991	0.2	1.1
February 1992	0.0	3.8
May 1992	0.3	6.4
July 1992	0.7	5.0
October 1992	0.7	4.5
February 1993		6.3
October 1993	1.0	3.0

Chuditch numbers continue to be greater in the baited forest compared with the unbaited forest and it now appears that fox control assists the conservation of chuditch, as well as other medium sized mammal species. It will now be possible to implement broadscale fox baiting programs in the jarrah forest, and this is likely to commence in April 1994.

This action has now been completed, although the chuditch population will continue to be monitored as part of the response to the prescribed burning study.

A fox baiting program commenced in the Mundaring Hills Forest in May 1993 and this should benefit chuditch as well as other medium sized forest mammals. Fox control has also been continued at Julimar Conservation Park where chuditch were translocated in September 1992.

3.3 Population and habitat monitoring:

A chuditch monitoring program was established in the Hills Forest at Mundaring in 1993. Trapping has been undertaken in February, April and November. Fox baiting commenced in April. Trapping success ranged between 0.2 and 1.0 % which is typical of chuditch densities in unbaited jarrah forest. It is anticipated that these rates will increase as the baiting program reduces the fox population.

3.4 Further research:

3.4.1 Distribution and requirements in semi arid areas:

No action in 1993.

3.4.2 Parasites and disease:

The health monitoring program developed by the Perth Zoo continued during 1993. Health monitoring was conducted at Julimar in January, May, September and November during the regular monitoring of success of the re-introduction program. A total of 47 chuditch were surveyed comprising individuals released in September 1992 and March 1993, as well as some previously unidentified wild animals.

In general, results have shown that:

a) Captive chuditch have a lower bacterial (*Salmonella* spp.) and parasite (*Coccidia* and *Strongyle* spp.) load than wild animals. Released animals maintain their parasite loads after release but no deleterious effects have been observed.

b) Red cell parameters (haemoglobin, PCV and red cell count) are higher in captive animals than wild counterparts, possibly reflecting:
- differences in diet and hydration.
- age differences between groups.

c) Eosinophil counts are higher in captive animals, possibly reflecting insect hypersensitivity reactions on ear pinnae. A study on the density of adult mosquitoes at the chuditch breeding enclosures was conducted by the WA Health Department. Their conclusion was that the numbers of mosquitoes represented a moderate nuisance and that abundance may increase in summer. Insecticide treatment of the enclosures is being considered.

d) Lesions on the feet pads have been noticed on several released animals. Pre-release husbandry may have to include exposure to harder substrate to toughen the feet pads.

A poster on the Chuditch health monitoring program was presented by Stephanie Haigh at the Reintroduction Biology Conference at Healesville Sanctuary in April 1993, and at the Sixth International Theriological Conference in Sydney, July 1993.

3.5 Captive breeding program:

The captive breeding program was successful again in 1993. Six females came into oestrus in early May. Two did not conceive, and 20 young were born to the other four.
However two of the young were lost at an early stage, one was eaten by the mother, the other ejected from the pouch.

The weaned young were sexed at 8 males, 10 females and separated from their dams in October. A weaned male was found dead in its enclosure, but the cause of death was unknown.

Hair samples have been taken from all of the captive animals and forwarded to Dr Bill Sherwin, University of NSW, for his ongoing work on quoll genetics. In addition two fresh whole blood samples were supplied in order to compare DNA yields from fresh and frozen samples.

A chuditch exhibit and public display has been prepared in the nocturnal house and should be operating early in 1994.

3.6. Translocation program:

A further 19 captive bred Chuditch were released at Julimar Conservation Park in March 1993, bringing to 43 the total number re-introduced to this area. During the year the success of this trial has been monitored in January, May, September and November The major findings from this are:

a) Released animals have established home range areas and trap success rates have been maintained at between 1.3 and 2.2 %. After 4 months, half the radio-collared animals had established home ranges more than 2 km from their release site. Males tended to move further in this time than females.

b) Generally there was an improvement of den quality with time. Within 1 month most were using good quality den sites. Arboreal sites were also used.

c) Adult body weights vary seasonally but this is synchronized with wild populations. Males are significantly heavier than females at all times.

d) Breeding occurred during 1993. In September three females were lactating and another had young attached. In November one 1993 born young was trapped. Another unmarked adult female was also trapped in November and it is possible that low numbers of Chuditch were present at Julimar before the translocation program was commenced.

e) Three radio-collared chuditch are known to have died in 1993 (in addition to one in 1992). One was shot accidentally on an adjacent farm, one was attacked by a cat and died of infection, and a third radio-collar was found with teeth marks on the collar. In arid and semi-arid parts of WA were foxes have been controlled, feral cat numbers have increased significantly and this may be a potential problem for Chuditch re-introductions to semi arid areas. At Julimar it may also be necessary to implement cat control in the future if cat predation becomes a problem.

A paper on the translocation of Chuditch to Julimar was presented by Keith Morris and Peter Orell at the Reintroduction Biology Conference, held at Healesville Sanctuary in April 1993.

The recovery team proposed that the possibility of translocating 1993 captive born Chuditch to the Bindoon training area, adjacent to Julimar, be explored. This would provide a total area of about 40 000 ha and greatly enhance the long term survival of a Chuditch population in the area. The Australian Army has indicated that it would be prepared to financially support such a program, but final approval has not yet been received.

Twenty nine Brushtail Possums (*Trichosurus vulpecula*) were also released at Julimar in 1993, and Woylies (*Bettongia penicillata*) will be translocated in 1994. This is part of CALM's plans to reconstruct the fauna of Julimar.

The assistance of the Australian Army during 1993 in providing accommodation at their Bindoon training facility is again acknowledged and appreciated.

Budget

During 1993, both the ANCA Endangered Species Program and World Wide Fund for Nature (with a grant from Alcoa of Australia Ltd) contributed significantly to the implementation of the Chuditch Recovery Plan. $61 300 was received from ANCA and $39 069 from WWF Australia. CALM contributed $128 000 to the implementation of the recovery plan through salaries for a research scientist and district staff, and vehicle standing fees.

The ANCA grant of $61 300 included $20 290 for maintenance of the captive breeding and health management program at Perth Zoo.

Conclusions

Implementation of the Chuditch recovery plan progressed well in 1993. The effect of fox baiting trial was completed and the successful outcome of this has enabled CALM (with support from Alcoa) to implement a broadscale fox baiting program in the Jarrah forest enhancing the conservation of Chuditch and other medium sized forest mammals. The translocation trial at Julimar also appears to have been successful and this has provided valuable information and experience for future Chuditch translocations. Captive breeding of forest Chuditch at the Perth Zoo has become a routine operation and it is anticipated that captive breeding of semi arid animals will also become routine. Monitoring of Chuditch populations in the Jarrah forest is not occurring as rigorously as required and CALM district staff need to be more involved with this. Actions relating to erection of road warning signs and information signs at recreation sites also need boosting and this will occur in 1994.