



Global Re-introduction Perspectives: 2010

Additional case-studies from around the globe
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IUCN/SSC Re-introduction Specialist Group (RSG)





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Using captive-bred helmeted honeyeaters to establish a new population and supplement an existing population, Victoria, Australia

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Introduction

The helmeted honeyeater (*Lichenostomus melanops cassidix*) has declined to one small population comprised of about 15 breeding pairs inhabiting a narrow remnant of riparian swamp forest at Yellingbo in central, southern Victoria. Recently, a second population has been established by the release of captive-bred birds into riparian habitat buffered by a 16,500 ha conservation reserve, Bunyip State Park, 30 km south-east of Yellingbo. The re-introduced population totals about 40 individuals, including 10 breeding pairs. In addition 17 pairs are currently held in captivity at two locations - Healesville Sanctuary, Victoria and Taronga Zoo, New South Wales. Now restricted to dense, swampy, riparian forest, the helmeted honeyeater has suffered from clearing of vegetation for agriculture, and habitat degradation due to reduced stream flows caused by water extraction and drought/climate change. Increased competition and predation resulting from altered avian community dynamics may also constrain population growth. Because it is a subspecies, the helmeted honeyeater has not been assessed by IUCN but it qualifies as critically endangered under Criterion C2ai. An intensive recovery program began in 1989 and has continued for 20 years (Menkhorst, 2008). A bibliography of research and management of the helmeted honeyeater is provided in Menkhorst (2008) (available online at: www.environment.gov.au/).



Captive-bred helmeted honeyeater released at Yellingbo, Victoria, Australia

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Radio transmitter being glued to the back of an anaesthetized helmeted honeyeater before release © I. Stych

Goals

- Goal 1: Manage the captive population of helmeted honeyeaters to maintain a viable captive population and produce at least 15 young/year that are available for release; maintain at least 95% of the wild heterozygosity in the captive population.
- Goal 2: Develop release strategies that encourage birds to form fidelity to a site and establish a new breeding colony.
- Goal 3: Increase the number and size of wild populations-attain at least 200 wild individuals spread between at least two self-sustaining populations, at least one of which is in a separate water catchment to the remaining wild population at Yellingbo.
- Goal 4: Investigate the value of release of captive-bred birds to supplement the declining population at Yellingbo.
- Goal 5: Identify and conserve other patches of suitable habitat for future population expansion and re-establishment.

Success Indicators

- Indicator 1: Annual production of at least 15 independent young available for release.
- Indicator 2: Establishment of at least one self-sustaining population in a different water catchment to the remnant wild population.
- Indicator 3: Reversal of the decline in number of breeding pairs at one Yellingbo breeding site.

Project Summary

Relevant Ecological Attributes: Helmeted honeyeaters are territorial, sedentary and aggressive towards potential competitors. Territories are clumped into colonies in patches of suitable habitat and there is a degree of communal defence of the colony area. The birds are long-lived, lay multiple clutches through an extended breeding season, and have high survivorship after fledging (Smales *et al.*, 2009). Females disperse from their natal territory before the breeding season after their birth and almost all successful dispersals are to a different colony. Males remain in their natal territory longer and most remain for life within their natal colony. Release sites should therefore be spread along a length of riparian habitat with the aim of establishing several colonies so that females have options for dispersal between colonies.

Feasibility: Captive management of the helmeted honeyeaters began in late 1989. Recognizing the small population size from which to draw founding individuals, the maintenance of heterozygosity in wild and captive populations has been a priority. This has been pursued via standard zoo studbook protocols and, for the wild populations, by the manipulation of pairings or transfer of eggs or young between populations, as required.



Release aviary at the Bunyip State Park

© P. Menkhorst

The feasibility of using captive-bred birds to re-establish populations of helmeted honeyeater in unoccupied habitat was investigated through a series of trials that included:

- Translocation of wild birds (most returned to their former colony (within 2 km) or eventually disappeared).
- Housing decoy males in an aviary in the hope of attracting dispersing females to the site (no evidence of visits by females over six months encompassing the female dispersal period).
- Release of family groups after breeding in on-site aviaries in the hope that offspring will be attached to their natal site (some success but labor-intensive and expensive).
- Release of potential partners for resident males (one successful pair bond developed and nests built but breeding unsuccessful).
- Hard release of family groups including dependent young (no evidence of improved success rates over release of mixed-parentage groups).
- Hard release of groups of captive-bred birds of varying age and sex ratios (first-year birds seem to survive better and have a greater chance of establishing territories than older birds).
- Once breeding at the release site had been achieved, nest supplementation with eggs or chicks from captive or wild nests (mixed success to date).

The availability of suitable habitat away from Yellingbo was assessed by the development of a habitat suitability model based on studies of helmeted honeyeater ecology and habitat utilization. Sites of historical records were visited to search for secure areas of unoccupied habitat that best fitted the model; these areas were then assessed for their suitability as future release sites. To inform the development of longer-term captive-release strategies, we modeled the reproductive potentials of the captive and re-introduced populations to improve understanding of the demographic boundaries operating (McCarthy *et al.*, 2004). The most effective and economic release strategy was found to be the release of

groups of independent young during autumn after housing them in an on-site aviary for up to seven nights. Riparian vegetation in Bunyip State Park was found to best fit the criteria for a release site, in terms of habitat suitability, site security and capacity to manage the surrounding land.

Implementation: Re-introduction to Bunyip State Park began in 2001 with the release of 11 birds and has continued annually, totaling 108 birds over nine years. Survivorship of released birds is summarized in *Success of project* section. Breeding of released birds began in the second year of the release program and the annual number of nest attempts at Bunyip State Park has increased steadily. Releases at a second site, 1 km upstream of the first site, began in 2005 and the first breeding at Site 2 occurred the following year. A third release site was established in 2008 between the other two.

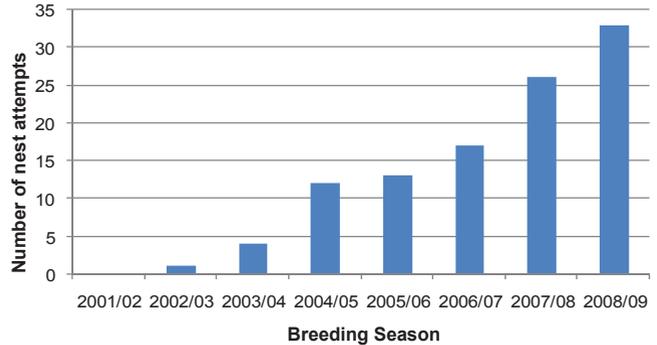
Post-release monitoring: Monitoring of released birds is undertaken by applying individually recognizable leg bands to all birds prior to release, and recording all subsequent sightings. The project's Field Ornithologist and volunteers regularly search for color-banded birds and record their location and behavior. In 2004, 12 of 17 released birds were radio-tagged with a transmitter glued between their scapulars. It was hoped that they would lead us to an unknown site utilized by missing birds. However, some transmitters detached prematurely and the remaining tagged birds only made local movements during the life of the transmitter. Current resourcing levels do not allow for incorporation of radio-telemetry as a routine monitoring strategy. Post-release monitoring should continue for at least two breeding seasons after the last release so that success can be described in terms of the proportion of released birds entering the breeding population.

Major difficulties faced

- Production of adequate numbers of independent young from the captive colony. Although breeding participation in captivity is high, the proportion of infertile eggs has constrained growth of the captive population. Hatching success and fledging success were also lower than expected and not significantly better than in the wild population. This situation is steadily improving as captive husbandry is refined through experience and the application of advanced technologies.
- The small number of birds available for release limits options and opportunities for an experimental approach, thus limiting our capacity to learn by doing.
- Variability in breeding success within the captive population means that some pairs are over-represented in the potential release cohorts and release of full siblings or other closely-related birds is difficult to avoid.
- Nest predators reduce breeding success of the wild populations. A suite of indigenous bird and reptile species prey upon eggs and nestlings of the helmeted honeyeater. This has constrained the rate at which the re-introduced colony is able to grow, and attempts to identify and manage potential nest predators have consumed considerable time and resources.
- Drought: the re-introduction program has corresponded to 11 years of below average rainfall resulting in significant change to the hydrological

characteristics of the creek system. As well as affecting the timing and success of breeding (Chambers *et al.*, 2008), the rainfall deficit has likely reduced the availability of food in the riparian zone, in the form of plant exudates and arthropods. Consequently, we have felt it necessary to provide supplementary food to the released birds for longer than we would have liked.

Fig. 1: Number of nest attempts (egg laying confirmed or inferred) at Bunyip State Park/Tonimbuk, breeding seasons 2001-2002 to 2008-2009



- Even with a full-time Field Ornithologist dedicated to the task, monitoring survival and breeding success in the increasing population of released birds, and providing supplementary food to them, is labor-intensive, time-consuming and difficult to resource and maintain over an extended period.
- In combination with the dry conditions, the threat of wildfire is serious and on-going. Wildfires have threatened the Bunyip State Park release site in two of the past six summers, most notably in February 2009.

Major lessons learned

- Success in developing and maintaining a viable captive population cannot be assured and the effort required may be difficult to predict - captive management of the helmeted honeyeater has proven problematic compared to other members of the Family Meliphagidae, for example the regent honeyeater (P. Menkhorst unpubl. data). Some 'pairs' housed together never form a pair bond, others produce infertile eggs, and the captive population has proved to be susceptible to a range of diseases.
- The costs of housing birds in release aviaries for extended periods (including the time demands on skilled keeping staff) are not justified by any clear advantage in terms of survivorship of released birds.
- Pairings amongst released birds tend to occur within release cohorts so release cohorts should not include closely-related individuals.
- The potential impact of indigenous predatory species needs to be a component of pre-release planning, including careful assessment of options for their management.
- The preparation of emergency response plans helped ensure that adequate resources were available to protect critical habitat and the captive population during a bushfire emergency.
- The tasks of post-release monitoring and supplementary feeding would not have been achieved without on-going assistance from trained volunteers from a community support group, the Friends of the Helmeted Honeyeater.

Success of project

Highly Successful	Successful	Partially Successful	Failure
		√	

Reason(s) for success/failure:

- Individuals released under all of the scenarios described above have survived for six months or longer. Of 95 captive-bred birds released at Bunyip up to the end of 2008, 31 (33%) are known to have survived for at least one year, and 21 (22%) have successfully bred in the wild. At Yellingbo the equivalent figures from a total of 59 released birds are: 23 (39%) and 14 (24%) respectively. The re-introduced wild population in Bunyip State Park produced 31 fledglings during the 2008-2009 breeding season.
- The re-introduced population has grown steadily in number and in breeding participation but is still too small to be considered self-sustaining.
- The re-introduced population at Bunyip is conforming to the natural dispersal system of female dispersal and male fidelity to the natal colony, thus supporting the strategy of creating several separate colonies spaced along the streamside habitat.

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