4. MALLOEFOWL IN NEW SOUTH WALES: REVIEW OF PAST AND FUTURE ACTIONS

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Abstract

One of the key challenges facing Malleefowl conservation in New South Wales is the ability to increase the volunteer effort in the monitoring and management of the species. Compared with the other Malleefowl states, New South Wales has relatively little volunteer involvement, apart from some assistance from the Victorian Sunraysia Malleefowl Preservation Society and the Goonoo Bigfoot Malleefowl Project. Landholders in the Lower Murray Darling Catchment Management Authority area are playing an active role in Malleefowl conservation, but more participation is needed across the range of the species, which spans seven Catchment Management Authorities. Although the Malleefowl’s distribution spans from the south western corner to as far east as the Goulburn River National Park, the core populations occur in the south western corner of New South Wales (on both National Parks and leasehold land) and the central New South Wales mallee around Yathong, Nombinnie and Round Hill Nature Reserves and adjoining leasehold lands. The main recovery actions on Department of Environment and Climate Change estates have been aerial and ground-based fox-baiting and monitoring via aerial survey and some ground based monitoring. Control of feral goats is another important activity that will assist in the protection of Malleefowl habitat. Some preliminary results of the aerial surveys are presented here, with mound to mound surveys indicating an increase in breeding activity following fox-baiting. Opportunistic monitoring of the one of the eastern most populations in the Goonoo State Conservation Area (formerly Goonoo State Forest) near Dubbo, has been undertaken by members of the Goonoo Bigfoot Malleefowl Project, but unfortunately about 25000 hectares (of the 63000 hectare reserve) including much of the core habitat was burnt in a wildfire in 2007. A successful captive breeding program has been operating at the Western Plains Zoo at Dubbo since 1990. In that time, over 500 juvenile birds have been released at Yathong and Nombinnie Nature Reserves to supplement the wild population. It is hoped that with the recent creation of Catchment Management Authorities in New South Wales that more extensive off-park work may be undertaken in New South Wales, particularly in the south-west corner, and this may increase the amount of volunteer work that is undertaken.

Introduction

In recent decades, much of the effort undertaken in the conservation of the Malleefowl (Leipoa ocellata) in New South Wales has been undertaken by government agencies. The lead agency has been the New South Wales National Parks and Wildlife Service, which now constitutes one of the divisions of the Department of Environment and Climate Change. The main actions undertaken include:

- Fox baiting and monitoring
- Aerial Survey
- Captive breeding/release of chicks
- Habitat Management (including fire)

Unlike the other states with Malleefowl populations there has been very little coordinated conservation work on the species undertaken by volunteers. For example, in New South Wales there are no Malleefowl monitoring grids that are surveyed using volunteers, despite large numbers of grids being established and monitored by volunteers within the Mallee region of Victoria. Some of the projects in New South Wales that have involved volunteers in the past include:

- Baseline data within Mallee Cliffs National Park and Tarawi Nature Reserve established from transects walked by Sunraysia Malleefowl Preservation Society and Venturer/Rover Scouts
Community involvement (coordinated by Sunraysia Malleefowl Preservation Society to put road signs along the Sturt Highway (and Malleefowl Rest Area) because of birds being hit by vehicles
- Goonoo Bigfoot Malleefowl Project
- Ad hoc programs by landholders, such as fox-baiting around active mounds

Some landholders within the Lower Murray Darling Catchment Management Authority area have been actively involved in Malleefowl conservation actions such as fox control and grazing removal as part of incentive programs or offsets for clearing approvals.

New South Wales Population

National Parks and Wildlife Service (2002) lists the state population as less than 500 pairs based on data from the mid-1990s (Priddel & Wheeler 1995). This follows estimates for the mid-1980s of around 750 pairs (Brickhill 1987). Although the exact size of the current New South Wales population is not known, there is no doubt that the overall population has declined since European settlement (Benshemesh 2000). Figure 1 shows the records within the Department of Environment and Climate Change Atlas of New South Wales Wildlife (2007) for three periods (pre 1990, 1990-2000 and since 2000) and shows the concentration of records is restricted to relatively few areas (chiefly Department of Environment and Climate Change conservation reserves). These figures have been influenced by the way that the data have been collected, particularly with earlier surveys obtaining records from “private” lands that have not been surveyed comprehensively again. Other sites, such as Goonoo State Conservation Area, are biased by larger survey effort (particularly by amateur birdwatchers from Sydney) while other areas, particularly leasehold land in the south west corner of New South Wales have been particularly poorly surveyed.

Approximately 80 percent of the New South Wales population occurs in the south western corner of the state within the Lower Murray Darling Catchment Management Authority area (Figure 2). Department of Environment and Climate Change reserves within this area that have Malleefowl are Mallee Cliffs National Park (58000 ha with approximately 45 pairs) and Tarawi Nature Reserve, which with the adjoining Scotia Sanctuary (managed by Australian Wildlife Conservancy) and Nanya Station (University of Ballarat) has approximately 127000 ha with an estimate of 30 pairs. Over 300 pairs are estimated to occur on leasehold land much of which retains native vegetation and includes properties such as “Petro”, “Lethero”, “Wamberra”, “Arumpo” and “Wampo” Stations. Large areas of habitat suitable for Malleefowl in the Lower Murray Darling Catchment Management Authority area has been set aside for conservation (usually as an offset for vegetation clearing approval) in such reserves as Southern Mallee and Property Vegetation Plan Reserves (Figure 2). Domestic stock grazing is excluded from these reserves, and the leaseholder has other management requirements, such as removal of feral goats.

The situation for the remaining 20 percent of the New South Wales population is significantly different. This portion of the population occurs on the central west slopes and plains within an area bounded by Narrabri, Dubbo, Temora, Griffith, Ivanhoe and Cobar (Figure 3). Though the species probably occurred in suitable habitat throughout this area, much has now been cleared for agriculture so most local populations are restricted to larger areas of remnant vegetation. These include Yathong, Nombinnie and Round Hill Nature Reserves (total area of 237000 ha and approximately 30 pairs), Goonoo State Conservation Area (until recently Goonoo State Forest) which is over 63000 ha which in 2000 was estimated to have approximately 20 birds (New South Wales Department of Primary Industry 2003),
and the Pilliga State Forest/State Conservation Area which possibly has about five pairs. Until about 20-30 years ago, small Malleefowl populations still persisted in many of the smaller Nature Reserves throughout this region though they are now extinct in most (Big Bush, Pulletop, The Charcoal Tank and Gubbata) or have tiny populations that are probably not sustainable in the long term (Loughnan and Buddigower). Populations also occur in small State Forests, such as Jimberoo and Kolkibertoo, and crown land at Tallimba, but like other populations in small remnants, the long term future of these populations would appear to be bleak. It is predicted to be extinct by 2008 at Yalgogrin where much research was undertaken in between 1986 and 1999 with the population at the onset of research estimated to be 32 birds (Priddel & Wheeler 2003). Birds may still persist on freehold and leasehold land within this area, but the numbers are not known, and past clearing and mallee harvesting may mean that these birds are isolated and so may not be viable in the future. In the more arid environments around Cobar, the species is known to persist at low densities, but little survey has been undertaken in this area.
Management Activities

Fox baiting has been undertaken on Department of Environment and Climate Change reserves since the early 1980s, with more detailed data collection (such as baiting effort and take rates) being undertaken since the mid 1990s. Much of the recent activity has been undertaken through the Fox Threat Abatement Plan (National Parks and Wildlife Service 2001). The Malleefowl was one of 30 species to have targeted fox control to try and determine whether baiting is having an impact on numbers. Six
The majority of monitoring done in New South Wales is through aerial surveys. There are two methods that are utilised. The first, “mound to mound”, involves flying in a helicopter to a set number mounds that have been marked with numbered white aviation runway marker cones that aids detection from the air. As each mound is visited it is recorded as either active (i.e. nest mounded up, litter trails leading to mound, extensive soil and litter disturbance, birds seen actively digging), leaf
litter present (where that has been opened up and contains leaf litter but where nesting activity appears to have not taken place) or inactive (where no activity has taken place). This has been undertaken on Mallee Cliffs National Park and Tarawi Nature Reserve with about 150 mounds being surveyed at the former location since 1989. This method is significantly cheaper than surveying randomised aerial transects as much less flying time is required, but assumes that activity of a fixed set of mounds will be correlated with the number of active mounds across the entire site (i.e. recruitment into the population will be reflected by a greater number of the existing mounds being active). The other method of aerial surveys, “aerial transects”, involves flying 100 randomly selected transects within a 10 kilometre by 10 kilometre (10000 ha) area and recording any mounds on these transects. The transects are 100 metres wide by 10 kilometres long, giving a total area surveyed as 10000 hectares and are flown at 80km/hr at 60 metres altitude. Once a mound is located the helicopter hovers over the site and the mound is classified using the same criteria of active, leaf litter present and inactive. This methodology has been used to monitor the Fox Threat Abatement Program baiting sites plus the property “Wamberra” as a control site that has not been baited for the last five years. Some preliminary analysis on data from Mallee Cliffs National Park has shown that the two methods give a similar estimate of the breeding population present on the park (about 45 pairs in 2006).

Figure 4 shows the results from the mound to mound survey for Mallee Cliffs National Park. The first four years of data have been excluded as it is uncertain whether all mounds were counted. The first line of best fit (between 1993 and 1998) shows a slow increase in the breeding numbers in this period. Intensive fox baiting was commenced in 1995 and the data was analysed between 1999 and 2006 (allowing a four year lag to reflect recruitment after baiting started) showing a significant increase in the number of active mounds present.

A captive population of up to sixteen pairs has been maintained at Western Plains Zoo, Dubbo since 1988. The birds are sourced from the central west slopes population with most from Yalgogrin and a few from Loughnan Nature Reserve and Goonoo State Forest. Over 500 sub-adult birds have been released, mainly into Yathong Nature Reserve but more recently also Nombinnie and Round Hills Nature Reserves. There has been some limited monitoring, though this has been more intensive in recent years including the use of radio transmitters. Despite the intensive on-ground management of these reserves, the population of Malleefowl appears to be only achieving minor increases in size. Because of concerns that the programme may not be assisting the recovery of the populations at Yathong, Nombinnie and Round Hills Nature Reserves, the breeding and releasing of birds is...
Currently suspended, but the breeding population has been maintained in case future releases are allowed and also for educational purposes. The results of genetic analyses may mean that releases may not be restricted to the central west source population but may be used to supplement populations outside this area.

Native vegetation clearing is now managed in New South Wales through the Native Vegetation Act and the development of Property Vegetation Plans using the Native Vegetation Assessment Tools (formerly the Property Vegetation Plan Developer). Since the introduction of this legislation there has been a significant decrease in the amount of Malleefowl habitat sought and approved for clearing. It also has meant that approximately 51000 hectares of Malleefowl habitat within Lower Murray Darling Catchment Management Authority is now being managed for conservation (including stock grazing removed, feral goat management and some fox control amongst others) and another 15000ha under negotiation. This is in addition to the 87000ha that were reserved as part of the Southern Mallee Vegetation process, though these reserves were offsets for larger areas of clearing than has been approved using Property Vegetation Plans. Management of introduced herbivores, particularly goats, also has impacts on Malleefowl habitat quality. Studies are also being undertaken on Tarawi Nature Reserve, Mallee Cliffs and Mungo National Parks looking at total grazing pressure (including goats, rabbits and kangaroos), which may provide information that will improve habitat management for Malleefowl.

Fire management is also important for the ongoing preservation of Malleefowl habitat. Within Department of Environment and Climate Change reserves the main fire management method is the creation of fire breaks using strip burning which aims to prevent large wildfires burning an entire reserve. This should also allow the creation of a mosaic of different fire ages within the reserves, which will benefit the various threatened bird species that occur in the same habitat that each use different post-fire age vegetation (Clarke 2005). Fire management on leasehold land is even more difficult, with the main goal being suppression as quickly as possible to prevent large areas being burnt. Fire Management was excluded from Southern Mallee Reserve management actions, but is included within the actions required for a Property Vegetation Plan reserve. It is hoped that the Mallee Fire and Biodiversity Project being undertaken by La Trobe and Deakin Universities will provide further information on post-fire habitat requirements and hence appropriate fire management for threatened (and other) species across all tenures.

**Future Actions**

There are three additional activities that are currently underway that have management implications for the Malleefowl in New South Wales. These are:

- The development of Conservation of Regional Environments/Biodiversity Forecasting Tool by Department of Environment and Climate Change in conjunction with Lower Murray Darling Catchment Management Authority
- The Priorities Action Statement for threatened species conservation
- The capacity for Catchment Management Authorities to develop programs with landholders and volunteers to assist Department of Environment and Climate Change in threatened species management

The Conservation of Regional Environments/Biodiversity Forecasting Tool is a Geographic Information System based analysis tool that has been developed by Department of Environment and Climate Change for use in biodiversity management at a regional scale. It uses attributes such as preferred vegetation community and its condition, patch connectivity and fragmentation and entity behavioural attributes such as foraging and dispersal distance, home range and minimum viable habitat area (dispersal rates and reproductive rates generate Minimum Viable Habitat) to generate values such as occupancy and persistence of fauna entities. The Lower Murray Darling Catchment Management Authority (and the previous Southern Mallee Vegetation Committee) has provided funding and resources for the project and so currently the south west corner of New South Wales is one of the areas of focus of the spatial analysis. Currently 21 fauna entities (individual or groups of species sharing common characteristics) have been modelled for the Lower Murray Darling Catchment Management Authority area, including the Malleefowl (which has been modelled as an individual species).

Figure 5 shows one of the outputs (predicted occupancy based on current landuse) for the Malleefowl. Predicted occupancy is given as the percentage of likely occurrence (the higher the
Comparing Figure 5 with Figure 3 shows that the biggest factor driving the likelihood of occupancy is the condition of the vegetation that is calculated in the model from grazing pressure by stock. When grazing is removed, the suitability of the habitat increases. The lack of records in Mungo National Park and the “Petro” Southern Mallee Reserve to the north (Figure 3) may represent lack of survey effort or may indicate a difference in habitat that has not been included in the model. Targeted survey in this and other identified areas would be a useful task to help refine the model (and gain more information on the species’ actual distribution). An important factor to remember is that the model is a landscape feature model and hence does not include environmental variables such as rainfall or fire. There is scope to include these inputs and more detailed information gained from research and survey into the models to try and increase the accuracy of the predictions.

The New South Wales Priorities Action Statement was drafted in 2006 to identify actions that can be undertaken to achieve recovery of threatened species and can be done collaboratively with various stakeholders (including government agencies, Catchment Management Authorities, Non-Government Organisations, research organisations and volunteers) (Department of Environment and Conservation 2006). For over 800 threatened species, populations and ecological communities a number of actions (currently over 14000) have been prepared that can be used in programs that aid in their recovery and can also be used as a benchmark to measure how successfully recovery programs are progressing.

The Priorities Action Statement has replaced the requirement for a Recovery Plan for this species in New South Wales, which was at draft stage in 2002 (National Parks and Wildlife Service 2002).

Table 1 lists the actions that have been identified for the Malleefowl in the Priorities Action Statement. Many of these actions have been conducted by Department of Environment and Climate Change and other parties for a number of years. It is anticipated that each Catchment Management Authority will have a Threatened Species Implementation Plan developed for species which are considered as high priority within their area (high numbers of records or locally endemic) that will allow the identification of recovery actions and projects for future funding.

![Figure 5. Predicted current occupancy of Malleefowl generated using CORE/BFT.](image-url)
The Catchment Management Authorities (the equivalent of other states Natural Resource Management Boards) are a relatively new creation within New South Wales. They are important as they provide a strong link between government and land managers and also are a distribution point for federal government funds (such as through Natural Heritage Trust). It is hoped that strong links between Department of Environment and Climate Change and Catchment Management Authorities can be maintained and through such processes as the Priorities Action Statement that a coordinated approach to Malleefowl management with private land managers can be achieved. This may be through actions such as incentive-based agreements to remove domestic stock and feral goats, more intensive fox control programs, further research into the impacts of grazing on Malleefowl habitat and through establishing monitoring programs. Potential programs for the latter that are in preliminary
Table 1. Actions listed in the Priorities Action Statement for Malleefowl.

<table>
<thead>
<tr>
<th>No.</th>
<th>Strategy</th>
<th>Priority</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Recovery Team and Plan Coordination</td>
<td>High</td>
<td>Represent Department of Environment and Climate Change on National Malleefowl Recovery Team</td>
</tr>
<tr>
<td>2</td>
<td>Habitat Management: Feral Control</td>
<td>High</td>
<td>Implement fox control programs in conservation reserves and encourage and support (through advice, joint programs, resources, etc.) the control of feral cats and foxes in other areas of suitable habitat.</td>
</tr>
<tr>
<td>3</td>
<td>Habitat Rehabilitation/ Restoration and/or Regeneration</td>
<td>High</td>
<td>Use management agreements and incentives on private and leasehold land to manage total grazing pressure through such actions as removal of artificial water points and feral and native herbivore control.</td>
</tr>
<tr>
<td>4</td>
<td>Monitoring</td>
<td>High</td>
<td>Undertake annual aerial monitoring of established survey sites.</td>
</tr>
<tr>
<td>5</td>
<td>Monitoring</td>
<td>High</td>
<td>If considered appropriate, establish ground-based Malleefowl monitoring grids within suitable habitat outside Department of Environment and Climate Change reserves.</td>
</tr>
<tr>
<td>6</td>
<td>Captive Husbandry or ex-situ collection/propagation</td>
<td>Medium</td>
<td>Maintain a captive Malleefowl population at Western Plains Zoo.</td>
</tr>
<tr>
<td>7</td>
<td>Community and landholder liaison/ awareness and/or education</td>
<td>Medium</td>
<td>Produce and distribute information and provide technical support on the species to assist land managers and field-based support (such as LandCare and Catchment Management Authorities) to implement actions that assist in the species' recovery (including grazing strategies, vegetation rehabilitation and general information on the species).</td>
</tr>
<tr>
<td>8</td>
<td>Habitat Management: Fire</td>
<td>Medium</td>
<td>Determine, through research, the ecological requirements of the species, particularly in regard to fire, and incorporate the information into Regional and Local Fire Plans.</td>
</tr>
<tr>
<td>9</td>
<td>Survey/Mapping and Habitat Assessment</td>
<td>Medium</td>
<td>In reserves at the edge of the species' range, undertake survey to establish size and ongoing viability of populations.</td>
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Discussion are establishing a formal grid within Goonoo State Conservation Areas, and formalising a monitoring program on some of the leasehold land in south west New South Wales.

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References


