

## RECOVERY OUTLINE

# Malleefowl

1	Family	<i>Megapodiidae</i>
2	Scientific name	<i>Leipoa ocellata</i> Gould, 1840
3	Common name	Malleefowl
4	Conservation status	Vulnerable: A1ce+2bce

### 5 Reasons for listing

Though large, the population has probably decreased in size by at least 20% over the last three generations (45 years; Vulnerable: A1), based on a decline in the area of occupancy (c) and possibly the effects of introduced predators (e). The decline is likely to continue over the next three generations (A2) based on an appropriate index of abundance (the density of active mounds; b) as well as the criteria listed above.

	Estimate	Reliability
Extent of occurrence	900,000 km <sup>2</sup>	high
trend	decreasing	high
Area of occupancy	40,000 km <sup>2</sup>	medium
trend	decreasing	high
No. of breeding birds:	100,000	low
trend	decreasing	high
No. of sub-populations	100	low
Largest sub-population	3,000	low
Generation time	15 years	low

### 6 Intraspecific taxa

None described.

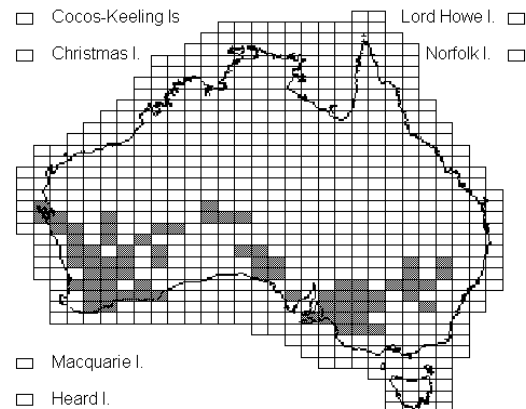
### 7 Past range and abundance

Most of southern Australia, from west coast, north of Carnarvon, extending north-east to southern Tanami Desert, N. T., then east to the western slopes of the Great Dividing Ra., and south-east to within 60 km of Melbourne (Blakers *et al.*, 1984, Kimber, 1985, Johnstone and Storr, 1998, Benshemesh, 1999). Historically, recorded in 166 one-degree grid cells across Australia. Last definitely recorded from the Brisbane Ra. and Melton, Vic., in mid-1800s (Campbell, 1900, Mattingley, 1908), the Northern Territory in 1940s (Kimber, 1985), north-eastern South Australia in 1960s (Robinson *et al.*, 1990). There are no historical population estimates available.

### 8 Present range and abundance

Since 1981, Malleefowl recorded in 81 one-degree grid cells, a contraction in area of occupancy of over 50% on the historical range. Within current area of occupancy, occurrence now much-fragmented. Species now found in scattered locations through semi-arid rangelands and dryland cropping zone in south-western and central New South Wales, north-western Victoria, south-east and Eyre Peninsula, S. A., Great

Victoria Desert, southern arid and semi-arid rangelands and central and eastern wheatbelt of Western Australia (Emison *et al.*, 1987, Brickhill, 1987, Cutten, 1997, Johnstone and Storr, 1998, Benshemesh, 1999). Monitoring at sites across species' current range suggests mean density of 1-2 pairs/km<sup>2</sup>.



### 9 Ecology

The Malleefowl is found principally in mallee eucalypt woodland and scrub as well as dry forest dominated by other eucalypts, Mulga and other *Acacia* spp., when they feed on seeds and herbage (Benshemesh, 1999). To build mounds, the birds need a sandy substrate with leaf litter (Frith, 1962). Highest densities of Malleefowl appear to occur on the better soils with higher rainfall. Habitat that is long unburnt is preferred. In the Victorian mallee, the optimal fire frequency is likely to be once every 60 years or even longer (Woinarski, 1989, Benshemesh, 1999). The birds do feed in recently burnt areas, but rely on unburnt refuges for breeding and shelter (Benshemesh, 1999), although a tight mosaic of burning in some arid habitats may promote food plants while preserving long unburnt cover (Benshemesh, 1999). Pairs occupy permanent territories, incubating an average of about 16 eggs in mounds of sand and leaf litter (Benshemesh, 1999). Young are precocial, but most die from starvation or predation in first few months (Priddel and Wheeler, 1990).

### 10 Threats

Clearance for agriculture has eliminated and fragmented much of the Malleefowl's habitat, resulting in localised extinction and fragmented populations.

The remaining isolated populations are now mostly in suboptimal habitat, since the mallee on the best soil has been cleared, and are vulnerable to catastrophic events such as bushfires. Fires cause local extinctions, and it may be 15 years before habitat is suitable and at least 40 years before maximum population densities are attained (Benshemesh, 1999). In the arid zone, extinction appears to have followed cessation of traditional burning practices, homogenisation of the once fine scale burning mosaic and fires on an unprecedented scale (Benshemesh, 1999). Predation of eggs, chicks and adults, particularly by foxes, are significant threats to small, isolated populations (Frith, 1962, Priddel, 1990), although, unlike with some marsupials, fox baiting has not resulted in rapid population recovery (Benshemesh, 1999). Chicks that survive predation often starve, particularly in habitat supporting stock, goats or rabbits (Frith, 1962, Brickhill, 1987) or exceptional densities of kangaroos (Priddel and Wheeler, 1990). However, even where herbivore numbers are low, starvation is probably frequent and recruitment episodic, depending on irregular pulses of high food abundance (Benshemesh, 1999). Small populations are probably particularly vulnerable to starvation, especially if surrounding paddocks are simultaneously fallow. Other threats include infertility, possibly from agricultural chemicals, and road-kills where Malleefowl feed on spilt roadside grain (Benshemesh, 1999).

## 11 Information required

- 11.1 Quantify effect of fox control on Malleefowl populations in a variety of circumstances.
- 11.2 Assess the distribution and size of the population in settled areas of all States.
- 11.3 Assess distribution and size of remote Malleefowl populations in S. A. and W. A.
- 11.4 Develop Malleefowl capture techniques and automatic recorders to identify individual birds.
- 11.5 Measure longevity and turnover of breeding Malleefowl.
- 11.6 Estimate rate of recruitment of young into the breeding population.
- 11.7 Define critical components of Malleefowl habitat.
- 11.8 Define appropriate genetic units for Malleefowl management.
- 11.9 Determine effectiveness of translocation, captive-rearing and breeding programs.
- 11.10 Assess extent of infertility in small reserves and possible links to agricultural chemicals.
- 11.11 Refine thermal sensing scans for Malleefowl.

- 11.12 Model population dynamics in relation to climatic fluctuations to determine likely impact of threats.

## 12 Recovery objectives

- 12.1 Secure existing populations across the species' range.
- 12.2 Maintain or increase breeding densities over three generations.
- 12.3 Maintain or increase (by management or survey) the existing area of occupancy over three generations.

## 13 Actions completed or under way

- 13.1 Numerous reserves have been declared, often with Malleefowl as their focus.
- 13.2 Habitat remnants have been fenced to exclude stock, often with the object of Malleefowl conservation.
- 13.3 Revegetation for Malleefowl has been undertaken in W. A. and Vic.
- 13.4 Feral goats have been greatly reduced on Peron Peninsula, W. A., north of the Murray in S. A., and on reserves in N. S. W.
- 13.5 Fox baiting has been initiated in all states in which Malleefowl occur, often explicitly to reduce Malleefowl predation.
- 13.6 Monitoring of nest densities occurs at sites in all States where Malleefowl occur.
- 13.7 A monitoring manual has been produced.
- 13.8 Captive breeding for population supplementation is occurring at Adelaide and Western Plains Zoo and at Peron Peninsula, W. A.
- 13.9 Population supplementation is occurring at Yathong Nature Reserve.
- 13.10 Rapid survey techniques using infra-red airborne scanners have been developed and are being refined (Benshemesh and Emison, 1996).
- 13.11 Education programs on Malleefowl are in place in all States and the species is the focus of activities by numerous community groups.
- 13.12 A Recovery Plan has been written (Benshemesh, 1999) and a national Recovery Team is in place.

## 14 Management actions required

- 14.1 Retain areas that support Malleefowl, and those that support Malleefowl habitat, and protect them from clearing.

- 14.2 Encourage land-holders to undertake conservation covenants and similar agreements.
- 14.3 Support initiatives to reduce further salinisation.
- 14.4 Remove goats and sheep from conservation reserves, and keep them at low numbers.
- 14.5 Close or fence artificial sources of water in conservation reserves.
- 14.6 Erect stock exclusion fencing around Malleefowl habitat.
- 14.7 Reduce rabbits where species abundant in or near Malleefowl habitat.
- 14.8 Work with graziers to reduce grazing by domestic stock in Malleefowl habitat.
- 14.9 Reduce the incidence of large fires, and promote fire patchiness, in reserves containing Malleefowl.
- 14.10 Provide means for protection from fire for small patches of remnant habitat.
- 14.11 Encourage the reinstatement of traditional indigenous fire regimes in central Australia.
- 14.12 Discourage broad-scale burning for agricultural purposes in areas known to contain Malleefowl.
- 14.13 Record and centralise details of fox control that is undertaken in where Malleefowl abundance being monitored.
- 14.14 Reduce fox and rabbit numbers in small and isolated habitat remnants.
- 14.15 Reduce fox numbers in areas where foxes suspected of causing declines.
- 14.16 Maintain or establish habitat corridors between patches of habitat suitable for Malleefowl.
- 14.17 Work with farmers near Malleefowl habitat remnants to ensure some grain is grown annually.
- 14.18 Minimise the amount of grain spilt on roadsides through Malleefowl habitat and erect warning signs where Malleefowl road fatalities are likely to occur.
- 14.19 Prepare regional conservation plans for the Malleefowl (west of Kalgoorlie; W. A. Goldfields, south-eastern W. A., western S. A. to N. T.; Murray Mallee; central N. S. W.).
- 14.20 Monitor trends in Malleefowl abundance.
- 14.21 Monitor Malleefowl breeding numbers.
- 14.22 Encourage Malleefowl volunteers and facilitate communication between groups.
- 14.23 Raise public awareness through education and publicity.
- 14.24 Manage the recovery process.
- 15 Organisations responsible for conservation**  
New South Wales National Parks and Wildlife Service, South Australian Department of Environment and Heritage, Victorian Department of Natural Resources and Environment, Parks Victoria, Western Australian Department of Conservation and Land Management, Parks and Wildlife Commission of the Northern Territory.
- 16 Other organisations involved**  
Birds Australia, other bird-watching societies, Parks Victoria, South Australian Malleefowl Preservation Society, Western Australian Malleefowl Preservation Group, Anangu Pitjantjatjara Land Management, Nature Conservation Society of South Australia, Mantung-Maggea Land Management Group, Central Lands Council, Malleefowl Preservation Society, Friends of Wyperfeld National Park, Ouyen Malleefowlers, Friends of the Malleefowl, Australian Trust for Conservation Volunteers, Green Corps, Malleefowl Preservation Group, North Central Malleefowl Preservation Group, Morawa LCDC, Kalgoorlie Goldfields Naturalists Club, Adelaide Zoo, Western Plains Zoo, Little Desert Lodge, Australian Regional Association of Zoological Parks and Aquaria, Australian Non-passerine Taxon Advisory Group.

## 17 Staff and financial resources required for recovery to be carried out <sup>1</sup>

*Staff resources required 2001-2005*

4.0

*Mallee Extension Officer in each State<sup>2</sup>*

1.0

*Project Officer*

2.0

*Technical Officer*

*Financial resources required 2001-2005*

<i>Action</i>	<i>Conservation agencies</i>	<i>Other funding sources</i>	<i>Total</i>
<i>Prevent further clearing of habitat<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Encourage conservation covenants<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Support initiatives to reduce further salinisation<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Close off artificial water sources in conservation reserves<sup>2</sup></i>	\$75,000	\$0	\$75,000

<i>Reduce grazing in mallee habitat<sup>2</sup></i>	\$250,000	\$100,000	\$350,000
<i>Reduce frequency of destructive fires<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Provide for access to habitat remnants<sup>2</sup></i>	\$75,000	\$30,000	\$105,000
<i>Encourage traditional burning<sup>2</sup></i>	\$250,000	\$0	\$250,000
<i>Discourage broad-scale burning<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Record fox control details<sup>2</sup></i>	\$85,000	\$0	\$85,000
<i>Fox reduction in small or declining sub-populations<sup>2</sup></i>	\$85,000	\$0	\$85,000
<i>Habitat corridors<sup>2</sup></i>	\$175,000	\$0	\$175,000
<i>Encourage cooperation among neighbouring farmers<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Minimise grain spilt<sup>2</sup></i>	\$75,000	\$0	\$75,000
<i>Regional conservation plans<sup>2</sup></i>	\$43,000	\$0	\$43,000
<i>Monitor trends in Malleefowl abundance</i>	\$67,200	\$0	\$67,200
<i>Monitor Malleefowl breeding numbers</i>	\$4,000	\$186,700	\$190,700
<i>Assess the benefits of fox control</i>	\$108,000	\$144,000	\$252,000
<i>Standardise monitoring and prepare manual</i>	\$6,000	\$2,500	\$8,500
<i>Settled area surveys</i>	\$6,000	\$71,500	\$77,500
<i>Remote area surveys</i>	\$95,400	\$0	\$95,400
<i>Test automatic recorders</i>	\$14,500	\$0	\$14,500
<i>Determine survival of adults</i>	\$10,300	\$48,000	\$58,300
<i>Determine recruitment of young</i>	\$44,000	\$24,000	\$68,000
<i>Determine critical habitat components</i>	\$70,500	\$0	\$70,500
<i>Genetic management requirements</i>	\$16,300	\$55,000	\$71,300
<i>Review captive management programs</i>	\$0	\$20,000	\$20,000
<i>Assess levels and causes of infertility</i>	\$8,300	\$0	\$8,300
<i>Refine thermal sensing scans</i>	\$5,500	\$0	\$5,500
<i>Increase volunteer involvement</i>	\$35,000	\$0	\$35,000
<i>Raise public awareness</i>	\$24,000	\$8,000	\$32,000
<i>Manage the recovery process</i>	\$49,000	\$0	\$49,000
<b>Total</b>	<b>\$2,127,000</b>	<b>\$689,700</b>	<b>\$2,816,700</b>

1 Costings largely derived from Benshemesh (1999)

2 Benefits will accrue to all threatened mallee taxa

## 18 Bibliography

- Benshemesh, J. 1999. Draft National Recovery Plan for Malleefowl. Version 5. Environment Australia, Canberra.
- Benshemesh, J. S. and Emison, W. B. 1996. Surveying Malleefowl breeding densities using an airborne thermal scanner. *Wildl. Res.* 23:121-142.
- Blakers, M., Davies, S. J. J. F., and Reilly, P. N. 1984. *The Atlas of Australian Birds*. RAOU and Melbourne University Press, Melbourne.
- Brickhill, J. G. 1987. The conservation status of Malleefowl in New South Wales. *RAOU Microfiche Ser.* M36.
- Campbell, A. J. 1900. *Nests and Eggs of Australian Birds*. The Author, Melbourne.
- Cutten, J. L. 1997. Distribution and abundance of Malleefowl (*Leipoa ocellata*) in the Murray Mallee and South East Regions of South Australia. (Draft). Nature Conservation Society of South Australia, Adelaide.
- Emison, W. B., Beardsell, C. M., Norman, F. I., Loyn, R. H. and Bennett, S. C. 1987. *Atlas of Victorian Birds*. Department of Conservation, Forests and Lands and RAOU, Melbourne.
- Frith, H. J. 1962. *The Mallee Fowl*. Angus and Robertson, Sydney.
- Johnstone, R. E. and Storr, G. M. 1998. *Handbook of Western Australian Birds. Vol. 1. Non-passerines (Emu to Dollarbird)*. W. A. Museum, Perth.
- Kimber, R. G. 1985. The history of the Malleefowl in Central Australia. *RAOU Newsl.* 64:6-8.
- Mattingley, A. H. E. 1908. Thermometer bird or Mallee fowl. *Emu* 8:114-121.
- Priddel, D. 1990. Conservation of the Malleefowl in New South Wales: an experimental management strategy. Pp. 71-83 in *The Mallee Lands: a Conservation Perspective*. J. C. Noble, P. J. Joss and G. K. Jones (eds). CSIRO, Canberra.
- Priddel, D. and Wheeler, R. 1990. Survival of Malleefowl chicks in the absence of ground-dwelling predators. *Emu* 90:81-87.

Robinson, A. C., Casperson, K. D. and Copley, P. B. 1990. Breeding records of the Malleefowl (*Leipoa ocellata*) and Scarlet-chested Parrots (*Neophema splendida*) within the Yellabinna Wilderness Area, South Australia. *S. Aust. Ornithol.* 31:8-12.

Woinarski, J. C. Z. 1989. Broombush harvesting in south-eastern Australia. Pp. 362-378 in *Mediterranean Landscapes in Australia: Mallee Ecosystems and their*

*Management*. J. C. Noble and R. A. Bradstock (eds). CSIRO, Melbourne.

#### Comments received from

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