Norton Gold Fields Proprietary Limited

Malleefowl Management Plan

September 2019

NORTON GOLD FIELDS

MALLEEFOWL MANAGEMENT PLAN

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Revision:	A	B	C	
[redacted]				

SUMMARY OF DOCUMENT REVISIONS			
Rev. No.	**Date Revised**	**Section Revised**	**Revision Description**
A	July 2012	All	Initial Document based around Enterprise Operations.
B	Dec 2014	All	Update to include all of Paddington Operations
C	September 2019	All	General update

1. PURPOSE

The Malleefowl Management Plan details the commitments Norton Gold Fields (Norton) is making in regard to managing operations to ensure negligible impacts on malleefowl around all project areas.

Norton, in line with its Environmental Policy, is committed to continual improvement and adopts an adaptive management approach to all environmental risks from its operations, including potential impact on malleefowl. This management plan identifies a range of management, monitoring and incident investigation measures that apply to all aspects and stages of active project areas.

Norton's commitment is to ensure that active mining projects do not adversely affect the abundance, geographic range and productivity of malleefowl in the vicinity of the mining operations.

2. BACKGROUND

Norton Gold Fields has an extensive tenement package of approximately 1,000km^2 (as of June 2019) in the Western Australian Goldfields, extending from its northernmost site located 60km north of Kalgoorlie at Ora Banda, to its southernmost location at Bullabulling, 60km south-west of Kalgoorlie. Norton's operations are centred on the Paddington Mill, located 35km north-north-west of Kalgoorlie. The Paddington Mill currently process ore from various open and underground pits. Suitable malleefowl habitat is known to exist in certain areas across these sites.

Mining operations at Paddington are standard gold mining operations and consist of open cut or underground mines, waste dumps and associated mining support infrastructure (administration offices, workshops, ablution facilities, run-of-mine pads, etc.).

Haulage of ore is along a network of constructed haul roads owned by Norton, and also include sections of gazetted road under agreement with the City of Kalgoorlie-Boulder (CKB). All haul roads undergo upgrades to ensure safe and efficient haulage operations. Suitable malleefowl habitat is known to exist in certain areas across these sites and associated haulage network.

Malleefowl (*Leipoa ocellata*) are listed as a vulnerable species under the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999*. Malleefowl tend to inhabit Mallee Eucalypts and Mulga (*Acacia aneura*) (see Appendix 1 - Malleefowl factsheet).

Regular flora and fauna surveys have identified areas containing habitat suitable for malleefowl with nests located at Mount Pleasant, Golden Cities and Ora Banda. In addition to annual targeted surveys, camera monitoring of active nests occurred in the breeding seasons of 2013 and 2018. These surveys and monitoring events confirmed the presence of malleefowl and showed evidence of reproductive success.

Sightings of live or dead malleefowl are reported to the Environment Department and records maintained so areas that have the potential to support further nests can be identified and explored in future monitoring programs.

There is a range of threatening processes for malleefowl that mining activities will potentially contribute to, including:

- Land clearing – Whilst historically the main threat has been associated with agricultural clearing and animal grazing, land cleared for commencement of mining operations, in particular removal of Mallee or Mulga habitat, will add further pressure;
- Noise and light overspill impacts from mining operations can shift individuals out of the area;
- Direct mortality by vehicle impacts;
- Crib rooms may create sources for feral animal predators (e.g. wild cats or dogs), attracted to food or putrescible rubbish, and gain increased access to local area resulting in opportunistic predation of malleefowl; and
- Bush fires cause both direct impact and loss of habitat, with the Mallee and Mulga habitats around Enterprise more likely to carry fire than the open Eucalypt woodlands around most other Norton operations.

It is possible that an active mound (currently being used by a breeding pair) could occur within a proposed mining infrastructure footprint, and require removal after appropriate approvals are sought. As per the procedure below, it is intended that if required, this disturbance will minimise the consequence of impact on this breeding pair.

This management plan outlines steps to be taken to limit any further impact on this species.

3. DEFINITIONS AND ACRONYMS

DBCA – Department of Biodiversity, Conservation and Attractions.

CKB – City of Kalgoorlie-Boulder.

Important population – is a population that is necessary for the species long term survival and recovery. They are either identified in recovery plans, are a key source population for breeding or dispersal, or are populations necessary for maintaining genetic diversity.

Population – a population is defined as a group of the species that interbreed and live in the same place at the same.

4. LEGISLATION AND STANDARDS

- Biodiversity Conservation Act 2016;
- Environmental Protection Act 1986;
- Environmental Protection (Clearing of Native Vegetation) Regulations 2004; and
- Environment Protection and Biodiversity Conservation Act 1999.

Malleefowl are listed as a Schedule 1 species (vulnerable) under the Western Australian *Biodiversity Conservation Act 2016*. Restrictions apply to the taking of malleefowl or their eggs under this Act.

Malleefowl habitat is also protected via the *Environmental Protection Act 1986* and Environmental Protection (Clearing of Native Vegetation) Regulations 2004. The native vegetation clearing provisions are in place to prevent unauthorised clearing of native vegetation and the corresponding habitat it provides for important species such as malleefowl. In particular, vegetation clearing is limited and controlled where the following principles apply:

- If it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia;
- If it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community;

Clearing permits issued contain conditions to limit what native vegetation clearing can occur. When clearing permit conditions are complied with, sufficient habitat will remain in project areas for the maintenance of significant habitat and threatened ecological communities, which may be inhabited by species such as malleefowl.

Malleefowl are also listed as vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Within the EPBC Act 'an action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance'.

The Department of the Environment and Energy has published 'Significant Impact Guideline 1.1' to assist companies in determining if an impact is likely to be significant.

With respect to vulnerable species under the EPBC Act, the following table shows Norton's assessment of the significance of its impact on malleefowl against the guideline criteria.

Guideline Criteria to assist in determining if an impact is likely to be significant; "An action is likely to have a significant impact on a vulnerable species if there is a real chance or probability that it will"	***Norton Consideration:***
Lead to a long-term decrease in the size of an important population of a species. or Interfere substantially with the recovery of the species.	Norton is committed to ensuring that mining operations do not adversely affect the abundance, diversity, geographic range and productivity of malleefowl in the vicinity of the operations. The possibility of any negative impact will be reduced by implementation of this management plan. Any inadvertent one-off deaths are unlikely to result in a long term impact on the population in the area.
Reduce the area of occupancy of an important population. or Adversely affect habitat critical to the survival of the species. or Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Large scale clearing is limited and controlled under a valid clearing permit. The clearing permit process has assessed the impact of loss of habitat. Flora and fauna assessments have identified a number of areas are habitat suitable for malleefowl. New disturbances in areas that are likely to contain malleefowl will be kept to a minimum.
Fragment an existing important population into two.	Habitat clearing associated with mining operations will take measures to ensure habitat fragmentation cannot occur.
Disrupt the breeding cycle of an important population.	Any active nests that are encountered during mine planning stages, as per the procedure below, will only be removed at the completion of the breeding cycle when it has been verified chicks have vacated the nest.
Result in invasive species that are harmful to a vulnerable species, becoming established in the vulnerable species habitat. Or	Much of the Goldfields, including Norton's operations have had pastoral, prospecting and mining activities occurring for over 100 years. Unfortunately this has resulted in widespread introduction of weeds and feral animals. Notwithstanding this:

Introduce disease that may cause the species to decline.	Feral animals are likely to be attracted by food scraps and other putrescible waste. Putrescible waste will be taken away to a licensed facility at least weekly during mining operations. Weed species are not identified as major threatening process for this species, but the Weed Management Plan will assist in this matter.

5. PROCEDURE

In order to ensure activities associated with mining operations comply with relevant environmental legislation, Norton have developed the following control measures, monitoring regimes and contingency actions to minimise the impact on malleefowl across mining operations;

Control measures:

- Clearing will be managed and minimised through Norton Gold Fields' approved Native Vegetation Clearing Permits;
- A targeted malleefowl survey will be undertaken in possible malleefowl habitat identified during flora studies or by specialist consultants. Where possible (having due regard to other environmental constraints such as Aboriginal & European heritage, nuisance, noise, dust, and surface water management, etc.), mining infrastructure will avoid malleefowl habitat. Specific impacts will be minimised on known active mounds where possible (e.g. moving access and haul roads away from active nests);
- Where a large amount of clearing is being sought in possible malleefowl habitat, an inspection will occur of the area and of any known active or inactive mounds. The pre-disturbance inspection will be conducted no more than two weeks prior to disturbance commencing. The inspection will be carried out by representatives of the Environmental Department and Mining Department;
- Where an active malleefowl nest is located within 50m of an access or haul road, it will be removed as a management measure to reduce the risk of death by road strike;
- Where an active malleefowl mound is identified between 50m and 100m of a road, signage will be installed to alert road users;
- Every effort will be made to avoid disturbance of malleefowl mounds during the breeding season (September to January). If clearing is to occur within this period, the relevant Clearing Permit conditions should be revised. Any mound removal will be supervised by the Environmental Department to ensure approvals required from regulatory bodies are first obtained. Prior to removal, a final inspection will be carried out to assess the activity status and whether eggs are present. If present, specialist advice will be sought to try and remove the eggs, incubate and then release the chicks with the relevant approvals (*Biodiversity*

Conservation Act 2016). The details of mounds removed will be recorded and reported in the Annual Environmental Report;

- Where work is to take place near an active mound that doesn't need to be removed, flagging tape demarcation will be placed at a 30m radius around the nest to ensure mobile plant does not enter, and additional flagging tape at 10m to prevent unauthorised personnel entering. Where personnel need to enter the 30m buffer the job should be planned so as to ensure it can be undertaken as quickly as practicable;
- Minimise the risk of fire within malleefowl habitat through standard site controls such as hot work permits, vehicle checks and fire suppression equipment on mining equipment. In addition, there will be a provision of appropriate mobile site based fire equipment at the Paddington Mill, to be utilised where needed across site;
- Lighting during operations will be placed where it doesn't compromise safety, and where practicable, will minimise light overspill from project areas;
- Implement feral animal control when hazard and incident reports indicate a presence in the area;
- Reporting and incident investigation for malleefowl injury, mortality or disturbance with incident reports provided to DBCA; and
- Inductions and training of staff and operators on site will identify the potential impact of mining operations on malleefowl.

Monitoring regime:

- A malleefowl survey will be undertaken in areas identified as likely to inhabit malleefowl, before mining operation approval is sought, and also annually in areas of known malleefowl habitation, or potential habitation. Surveys will, where possible, be timed to coincide with the breeding season to enable determination of the location of active malleefowl nests. Survey methodologies will be in accordance with the relevant industry standards (e.g. *National Malleefowl Monitoring Manual: Edition 2016-1,* published by National Malleefowl Recovery Team);
- Malleefowl surveys will occur on an annual basis across Norton's operations, concentrating on areas malleefowl are known to inhabit and including areas malleefowl are suspected to inhabit. Survey areas will be determined by report of sightings and future mining project plans which will inspect sufficient area to ensure comparisons can be made to baseline surveys;
- Malleefowl surveys will record MGA coordinates of mounds, dimensions, vegetation in vicinity, mound profile and status (as described by the *National Malleefowl Monitoring Manual*); and
- Recorded survey observations in Norton Gold Fields GIS Database.

Contingency measures:

- Should fires, in particular wildfires, occur or threaten mining tenements known to contain malleefowl, then Norton Gold Fields' emergency response will include malleefowl habitat protection as one of the assets to be protected; and
- Should annual monitoring indicate significant decline of malleefowl populations then Norton will review the data to determine contribution of mining operations versus natural causes (e.g. rainfall in the previous year). If mining operations are considered contributing factors, this management plan will be reviewed and additional measures implemented.

6. ROLES AND RESPONSIBILITIES

Chief Operations Officer

- Responsible for ensuring sufficient resources are available to implement this management plan.

HSE Manager

- Responsible for ensuring this management plan is updated on a biennial basis;
- Responsible for ensuring the annual malleefowl survey is undertaken, and the GIS database updated with survey findings;
- Ensure actions are implemented for hazard and incident reports associated with this management plan;
- Responsible for ensuring findings are reported in the Annual Environmental Report; and
- Responsible for ensuring any relevant results are reported to Area and Site Managers as appropriate.

Environmental Advisor(s)

- Responsible for updating of this management plan on a biennial basis;
- Responsible for co-ordination of the annual malleefowl survey and updating the GIS database with survey findings;
- Ensuring actions are implemented for hazard and incident reports associated with this management plan;
- Responsible for reporting findings in the Annual Environmental Report; and
- Responsible for review of data and reporting results to Area and Site Managers.

Open Pit / Underground Mining Manager or Delegate

- Responsible for ensuring site traffic management plans consider risk to malleefowl; and
- Ensure the presence or reports of live or dead malleefowl are reported to the Environmental Department for recording purposes.

7. TRAINING

Norton will ensure that inductions and training are provided to all site personnel and will include as a minimum:

- Photographs and description of malleefowl and their mounds including information on the species' vulnerable status;
- Notification that employees and contractors are banned from interfering with native animals and malleefowl mounds unless specific approval has been obtained;
- Notification to employees and contractors that feral animals must not be encouraged either through poor housekeeping (overflowing rubbish bins, potable water supplies left on) or direct feeding;
- The requirement that all malleefowl and malleefowl mound sightings are reported to the Norton Environmental Department;
- The requirement that all malleefowl injuries, mortalities and unauthorised mound disturbances be reported within the internal reporting system, Cintellate, and to the Norton Environmental Department;
- Employee restriction, unless authorised via the Norton Environmental Department, of 10m around active malleefowl mounds and limiting the time spent within 10 to 30m of mounds;
- Mobile plant restriction, unless authorised via the Norton Environmental Department, of 30m around active malleefowl mounds;
- Requirement that feral cat, fox and dog sightings be reported within Cintellate as a hazard and also directly reported to the Norton Environmental Department;
- Remind employees and contractors that site traffic rules, apart from their obvious safety benefit, are also in place to minimise risk to malleefowl. This includes complying with road signs, speed limits, restrictions to designated roads, and with off road driving prohibited (unless specifically authorised); and
- Remind employees and contractors that malleefowl have little 'road sense' and often do not move out the way of an approaching vehicle early enough to avoid impact.

Information regarding malleefowl mounds and locations of significant areas will be made available at least annually (following malleefowl surveys) to relevant departments. Educational posters will be displayed in prominent areas on site.

8. RECORD KEEPING

Norton Gold Fields' Cintellate database will be used to store records of:

- The current version of this management plan; and
- Malleefowl hazards and incidents observed on site.

Maps of locations of current known active malleefowl mounds will be provided in relevant offices and crib rooms where the nest may be located nearby and communicated at relevant toolbox meetings.

9. REVIEW

A review shall be carried out to ensure the content of this management plan is still applicable, current and practicable. A review should take place:

- Whenever the process/equipment changes;
- At a periodic frequency (2 years); and
- At incident investigation.

10. RELEVANT DOCUMENTATION

The following documentation may be utilised or referenced to comply with the requirements of this procedure;

Significant Impact Guideline 1.1 – Matters of National Environmental Significance – *Environmental Protection and Biodiversity Conservation Act 1999*.

National Malleefowl Recovery Team (2016). National Malleefowl Monitoring Manual: Edition: 2016-1.

The following survey reports have been prepared for Norton Gold Fields;

Benshemesh, J. (2007). *National Recovery Plan for Malleefowl*. Department for Environment and Heritage, South Australia.

Botanica Consulting June 2012. *'Enterprise Project – Malleefowl Nest Mound Survey – May 2012'*. Prepared for Norton Gold Fields Limited.

Botanica Consulting December 2013 '*Breeding Season Malleefowl Survey*'. Prepared for Norton Gold Fields Limited.

Botanica Consulting March 2014 '*Malleefowl mound activity Enterprise*'. Prepared for Norton Gold Fields Limited.

Botanica Consulting August 2014 'Wattlebird Project*Malleefowl Survey*'. Prepared for Norton Gold Fields Limited.

Botanica Consulting February 2017 'Breeding Season *Malleefowl Survey 2016-2017'*. Prepared for Norton Gold Fields Limited.

Terrestrial Ecosystems January 2018 'Level 1 Fauna Risk Assessment and the results of a Malleefowl Survey for the golden Cities Project Area'. Prepared for Norton Gold Fields Limited.

Terrestrial Ecosystems March 2018 'Annual Malleefowl Survey – Enterprise, Mulgarrie and North of Federal'. Prepared for Norton Gold Fields Limited.

Terrestrial Ecosystems December 2018 'Annual Malleefowl Survey – Enterprise, Carbine and Golden Cities'. Prepared for Norton Gold Fields Limited.

GHD Pty Ltd *Enterprise Development Activities Flora and Fauna Assessment* November 2009 Prepared for Paddington Gold Pty Ltd

APPENDIX 1

MALLEEFOWL FACT SHEET

(www.dpaw.wa.gov.au – 25 June 2019)

Malleefowl
Leipoa ocellata (Gould, 1840)

Size

550-610 mm in length

Weight
1.5- 2.5 kg

Subspecies

None recognised.

Description

Malleefowl are large ground dwelling birds that rarely fly unless alarmed. They have robust, powerful legs and the wings are short, broad and rounded at the tip. A crest extends from the front of the crown to the nape and is raised when the bird is alarmed. The upper body is boldly barred, fringed and streaked grey, white, black and rufous. The breast and belly are cream-white. The face is mid-grey with white line under eye and theill is slate grey. Malleefowl are well camouflaged in their mallee habitat.

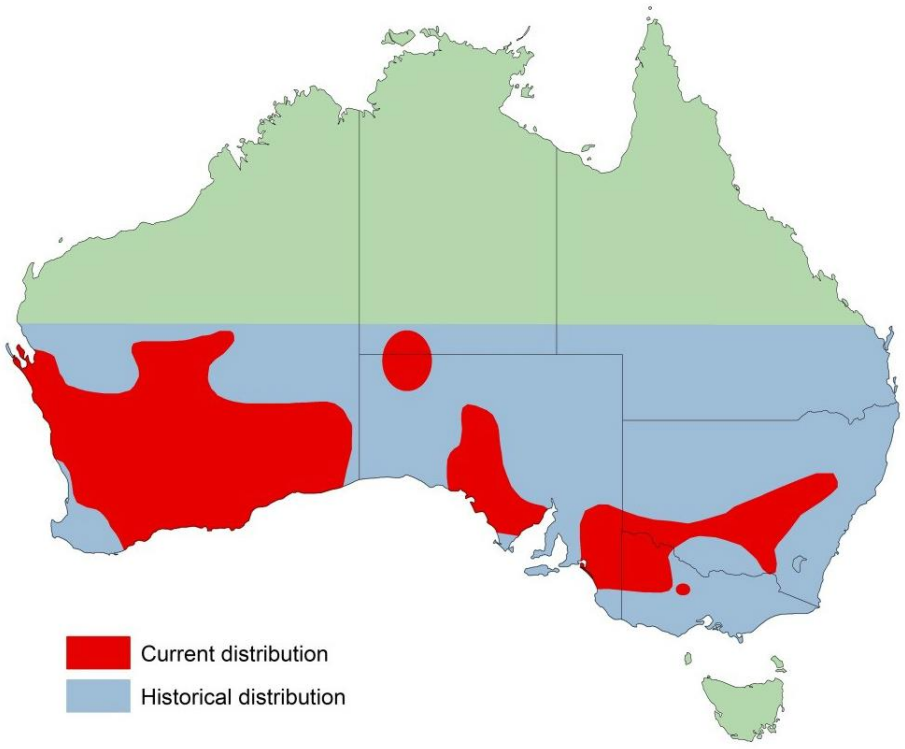
Other common names

Gnow, mallee chook, mallee hen

Distribution

Historically, the malleefowl was found in mallee regions of southern Australia including, south-west New South Wales, north-west and central-west Victoria, most of South Australia, southern Northern Territory and south-west Western Australia, from approximately the 26th parallel of latitude southwards.

Today it can still be found in most of these areas but appears to be extinct in the Northern Territory, northern South Australia, and the western and northern goldfields and far south-west in Western Australia. Its remaining range is highly fragmented, extending across southern Australia, from coastal Western Australia, through South Australia and north-western Victoria, to central New South Wales. In Western Australia, malleefowl occur in Dryandra State Forest, Fitzgerald River National Park, Kalbarri National Park, and Cape Arid National Park, and have been reintroduced into Francois Peron National Park, Shark Bay. They have also been reported from many reserves within and around the Wheatbelt.



Habitat

Malleefowl are largely confined to arid and semi-arid woodland that is dominated by mallee eucalypts on sandy soils, with less than 430 millimetres of rainfall annually. They may also be found in Mulga, *Acacia aneura*, and other sclerophyllous associations. In Western Australia malleefowl may also be found in coastal heath where shrubs produce sufficient leaf litter for use in nest mounds.

Behaviour

Malleefowl build distinctive nests that comprise a large mound of soil covering a central core of leaf litter. These nest mounds range in diameter but on average span more than five metres and may be up to one metre high. A malleefowl pair will often use the same

nest site each season rather than build a new one. Nest preparation occurs in autumn and the male will tend the nest through summer until temperatures begin to fall. The female helps with the nest initially but spends most of her time looking for food to meet the metabolic demands of egg production.

Malleefowl are generally monogamous and once breeding begins, pair for life. Breeding malleefowl tend to be sedentary, as they nest and roost in the same area year after year. While breeding, males do not stray far from the nest but at other times birds may range over several square kilometres. Home ranges do not appear to be defended, although in the vicinity of its nest the male is vigorously aggressive toward other malleefowl except its mate. Radio- tracking studies have shown that over the course of a year the birds may range over one to several square kilometres and that home-ranges overlap considerably. Malleefowl will usually find cover and remain motionless with any sign of a threat from the air. The same is generally true for terrestrial predators, as young will often rely solely on their camouflage to escape detection. Malleefowl will take to flight only as a last resort even though they are capable of strong flight.

Diet

Malleefowl are opportunistic feeders and will eat whatever food sources are locally or seasonally abundant. They are omnivorous and their diet may include foliage, fruits, flower buds and seeds of a diverse range of plants as well as invertebrates, and their products such as sugary lerps, tubers and fungi. Although it will drink if water is available, it normally lives without it.

Breeding

Established pairs generally breed annually. Eggs are laid from September to January four to eight days apart. The average clutch size is 16 (the range is between 5 and 33). The decomposing organic matter with which the birds fill the nest incubates the eggs for between 62 and 64 days. About 80 per cent of all eggs hatch provided they are not saturated by rain or raided by foxes.

Chicks hatch buried beneath soil up to one metre deep. Their struggle to the surface is unaided and may take up to 15 hours. Malleefowl chicks receive no parental care and within an hour of leaving the nest can run and feed independently. Mortality among chicks is high, with 80 per cent falling prey to, or dying from metabolic stress brought on by exposure or starvation within about ten days. Malleefowl chicks are capable of dispersing quite widely after emerging from the nest but some have been reported to stay within the vicinity for up to 10 days.

Malleefowl reach maturity at two, work a nest at three, and breed at four years of age. The lifespan of the malleefowl is unknown but studies have not recorded an individual breeding beyond 12 years.

Threatening processes

Potential threats for malleefowl include clearing of habitat for agriculture, increased fire frequency, competition with exotic herbivores (sheep, rabbits, cattle, goats) and kangaroos, predation by foxes and cats, inbreeding as a result of fragmentation and possibly hunting for food in marginal populations.

Conservation status

2000 IUCN Red List of Threatened Species	Vulnerable
Biodiversity Conservation Act 2016	Vulnerable
Environment Protection and Biodiversity Conservation Act	Threatened (Vulnerable)

Management in Western Australia

- Control of foxes, goats, rabbits;
- Prevention of wildfire in suitable habitat;
- Monitoring of malleefowl populations;
- Prevention of further clearing of mallee lands;
- Revegetation of high quality habitat; and
- Captive breeding of malleefowl for translocation to rehabilitated habitat.

Recovery projects include the National Malleefowl Recovery Team, made up of farmers, scientists, community groups and government agencies, implements actions outlined in the National Malleefowl Recovery Plan. They also manage the National Malleefowl Monitoring Database, which is a resource for mound monitoring data that has been annually collected by many individuals since the late 1980s. The Recovery Team is currently working with Melbourne University on the Malleefowl Adaptive Management Project.

Other interesting facts

- Malleefowl were regularly hunted by European Australians during the nineteenth and early twentieth centuries for food.
- Each egg the female lays weighs 10 per cent of the female's body weight.
- Within 24-hours of hatching from the eggs, young can fly because, unlike their downy body, their wings are well feathered.

Selected references

Garnett S. (1992). The Action Plan for Australian Birds. Australian National Parks and Wildlife Service.

Priddel D., and Wheeler, R. (1995). The Biology and Management of the Malleefowl in NSW. NSW National Parks and Wildlife Service. Hurstville, NSW.

Blyth J., Burbidge A., Brown A. and Hooper K. (1996). Working Together. LANDSCOPE 11(3): 36.

Website links

https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-animals/malleefowl