

# Action Statement

Flora and Fauna Guarantee Act 1988

No. 119

## Brolga *Grus rubicunda*

### Description and distribution

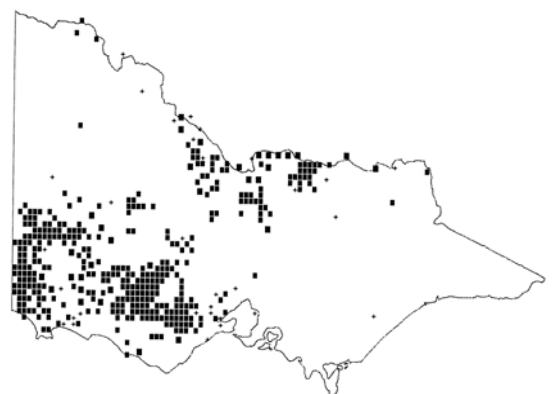
The Brolga *Grus rubicunda* (Perry) is a large, long-necked crane standing to 1.8 metres in height. They have long, dark legs and their plumage is predominantly light grey in colour. The average wing span of an adult is 1.7-2.4 metres. The adult male weighs 4.7-8.7 kilograms and the female 3.7-7.3 kilograms (Marchant and Higgins 1993). Adults have a conspicuous orange-red head which contrasts with the bare crown of greenish-grey skin and the darker pendulous dewlap. The bill is dark, long and straight and relatively large compared to the head. The iris is yellow to reddish-orange. Immatures (up to 10 months of age) have a grey, fully feathered head and the iris is dark brown. Juveniles (11 to 22 months) gradually lose the head feathering and attain the red head colouring. A full description can be found in Marchant and Higgins (1993).

The Brolga is distributed across New Guinea, northern and south-eastern Australia (Blakers *et al.* 1984, Marchant and Higgins 1993). The populations in Victoria and South Australia may now be isolated from the northern populations as there appear to be only scattered birds in New South Wales.

In Victoria, birds are currently found in the south-west, the Northern Plains and adjacent parts of the Murray River (Emison *et al.* 1987). The species was formerly more widely distributed and common, being recorded from the Melbourne area, Gippsland and North-eastern Victoria (White 1983).



Brolga, *Grus rubicunda*



### Distribution in Victoria

+ before 1970, ■ since 1970

[source: *Atlas of Victorian Wildlife*, NRE 1998]

## Life history and ecology

The Brolga is omnivorous and utilises a diverse range of food items on a seasonal basis. The main food items taken are vegetable materials, particularly the fleshy tubers of wetland plants, which it obtains by digging and foraging. The residues of grain and potato crops are also taken. Amphibians, sometimes small fish and a wide range of invertebrates are also taken including freshwater molluscs, crustaceans and insects (Marchant and Higgins 1993, White 1983).

During summer and autumn, many birds flock to deep freshwater marshes and permanent open water and adjacent dryland areas. Most of these areas are on private land. These sites provide for the birds' drinking, feeding and roosting requirements. It is possible that young adults form their initial pair bonds at these sites (Arnol *et al.* 1984). Not all Brolgas go to the flocking areas. Some breeding pairs with young remain close to their breeding areas (White 1983).

In late autumn and winter the flocks disperse back to the breeding areas where bonded pairs re-establish substantial territories. Most recorded nest sites are on private land. Pairs are capable of occupying these territories for many breeding seasons as they are long-lived birds (White 1983).

Nests are generally constructed on a slight rise or island in shallow herb-dominated or sedge-dominated freshwater marshes. Nests usually consist of a platform of coarse vegetation. Occasionally eggs are laid on the ground with a few pieces of coarse vegetation placed around them (Campbell 1900, Beruldsen 1980, Marchant and Higgins 1993). Usually two eggs are laid and the parents share in nest building, incubation of the eggs and rearing of the young. The chicks fledge 90-100 days after hatching and remain with the parents until the onset of the next breeding season or for another year if the parents do not re-nest (White 1983, Marchant and Higgins 1993).

Little is known about breeding success, however Hill (1992) estimates it to be about one chick per nesting attempt. White (1983) suggests that if hatching is successful it is more common for one young to be reared than two. This varies from season to season. Fledging success is unknown; however, losses of immature birds are attributed to predation by the Red Fox *Vulpes vulpes* and entanglement in wire fencing (Arnol *et al.* 1984).

## Current conservation status

NRE (2000)      Vulnerable (Vic.)

SAC (1991)      Threatened (Vic.)

The Brolga is listed as a threatened taxon under the **Flora and Fauna Guarantee Act 1988**.

## Decline and threats

The most recent population estimate of the Brolga in Victoria is 600-650 birds (Arnol *et al.* 1984). In 1992 a single day count located 635 birds in Western Victoria. There were 566 in flocks and the remainder were in small groups or pairs (White 1992). No counts were made of the northern Victorian population, however, this population has remained static at 60-70 birds from 1981 to 1996 with the largest flock of 28 birds being recorded at Corop in July 1994 (R. Weber *pers. comm.*). The population has remained at about the same level for about a decade. The issue of concern is that while the adult population may appear to be unchanged, it may be ageing as the Brolga is a long-lived bird. With increasing age, the fecundity may be reduced and with no recruitment to the population the numbers may crash when older birds die. Fertility was not considered a limiting factor in the early 1980s when 82% of eggs collected were fertile (White 1983). In 1980 immature and juvenile birds made up 10% of a flock at Willaura in western Victoria (White 1983); however, few were located during the 1992 survey.

Another impact on recruitment is the modification and disappearance of breeding wetlands. For example, drainage works have resulted in the loss of 79% of shallow freshwater marshes which are the preferred breeding wetlands in the western district of Victoria (Corrick 1982). Deep freshwater marshes which are used during the drier months and to a lesser extent for breeding have suffered a 66% reduction (Corrick 1982). In recent years some wetlands have been restored by landowners and Brolgas have bred on them; however drainage of freshwater wetlands still continues particularly where raised-bed cropping activities are occurring. Grazing of wetlands by stock also reduces vegetation leaving insufficient for nest construction when the wetlands fill (White 1983).

In recent years concern has also been expressed about the subtle influence of salinity on freshwater wetlands (Codd 1992, Kevin 1992) which may contribute to the loss of suitable habitat through secondary salinisation.

In addition there has recently been extensive planting of pine trees and blue gums in some rural areas, including the basalt plains. These plantations may impact on shallow freshwater wetlands in the vicinity by intercepting water that normally would flow into them.

Predation by the Red Fox on eggs and chicks is probably a major cause of nest failure at the present time (D. White *pers. comm.*).

Human activities have also had a direct adverse impact on Brolga populations. In the past, egg losses were due to egg collecting and trampling by

cattle, but they do not appear to be a major cause at present. Young birds have become entangled in fencing and may collide with vehicles and farm machinery (White 1983, Arnol *et al.* 1984). Netting fences present barriers to unfledged chicks, which must remain close to their parents. As breeding sites dry out, adults and young must find other sources of food and water, and if young cannot get through fences, they are more susceptible to predation or starvation.

There have been a number of reports of fledged Brolgas colliding with transmission lines (White 1983, Goldstraw and Du Guesclin 1991). If nest sites are in the vicinity of these power lines there is a possibility that these sites will be unsuccessful because of mortality of adults or newly fledged young.

In the past Brolgas were shot and poisoned to protect grain crops, but reports of these occurrences are now infrequent. Brolgas may also have been indirectly poisoned as a result of baiting programs for other pests, for example cricket baiting programs and use of other agricultural pesticides. Brolgas have also died as a result of illegal bird-poisoning activities when the target species was the Long-billed Corella *Cacatua tenuirostris* (D. Venn *pers. comm.*).

Last century Brolgas were also shot for food. Campbell (1900) stated 'its flesh is good for the table' and commented that they were frequently offered for sale in the Melbourne market.

It is not known if disturbance of flocks interferes with their social structure. Disturbance of areas such as Lake Muirhead during proclaimed hunting seasons may fragment flocks.

In its final recommendation the Scientific Advisory Committee (SAC 1991) has determined that the Brolga is:

- significantly prone to future threats which are likely to result in extinction, and
- very rare in terms of abundance or distribution.

The Brolga is non-migratory, but does undertake seasonal movements. They breed in shallow wetlands in one area and then move to traditional flocking sites which can be nearby or many kilometres away. In Victoria most birds are now restricted to the south-west. They are dependent on shallow, grass or herb-dominated freshwater wetlands for breeding, and permanent freshwater areas and a regular food supply at flocking sites.

- Activities that threaten the Brolga's preferred breeding habitat include:
- Drainage and modification of wetlands.
- Alteration of flood regimes during the breeding season which can cause nest abandonment.

- Modification of vegetation structure and species composition, water quality or soil structure at breeding and feeding sites.
- Widespread use of herbicides and pesticides especially in close proximity to breeding sites.
- Disturbance by hunting activities where young birds are still in the breeding wetland.
- Introduced predators taking eggs and killing chicks.
- Wildfire and burning programs, which remove nest material.
- Grazing by stock.
- Subdivision and fencing of large private landholdings.
- Erection of structures such as overhead powerlines.
- Use of wetlands for irrigation and/or re-use systems.

#### **Flocking sites are threatened by:**

- Disturbance by hunters during the duck season and deposition of lead shot in wetlands.
- Loss of habitat due to changes in vegetation, for example, changes in agricultural practices.
- Catchment degradation resulting in changes in water quality, including increased salinity, siltation or flooding.
- Poisoning of agricultural pests eg. crickets.
- Erection of structures such as overhead powerlines.

#### **Wider conservation issues**

The Brolga is one of a world-wide group of cranes numbering 15 species (Meine and Archibald 1996). At least ten of these species have an IUCN Red List category and are subject to a range of threats including hunting, habitat destruction, urban and agricultural development.

An issue of serious concern is the threat posed by introduced predators, in particular foxes. In the past, foxes were kept under some control by hunting when high prices were being paid for skins (White 1983). This resulted in greater breeding success for the Brolga (White 1983). Declining skin prices and lower hunting pressure (including the introduction of tighter gun controls) have resulted in increased fox numbers. This, in turn, has led to the fox being a major threat to a wide range of fauna. Fox predation has been listed as a threatening process under the **Flora and Fauna Guarantee Act 1988** (Mansergh and Marks 1993).

Habitat loss has occurred directly through drainage schemes and the modification of flood regimes. There has been an associated lowering of water quality through drainage of excess water introducing sediments and agricultural chemicals.

Increases in salinity can change the species composition and structure of wetland vegetation, particularly in breeding areas, making them less suitable for Brolgas and other species. For example the disappearance of frogs has been attributed to increasing salinity (Main 1990).

The emphasis on engineering works to solve salinity problems in northern areas of Victoria has been suggested as a major cause of the decline in wetland values in the area (DCE 1992). In addition the extensive drainage schemes in the south-west of Victoria have reduced or eliminated extensive shallow wetland areas (A. Corrick *pers. comm.*) While birds still frequent areas affected by these programs, for example in the Strathdownie Drainage Trust area, there is an obvious reduction of habitat. In Asia there is concern that the reduction in preferred flocking sites by wetland drainage causes cranes to concentrate in much larger numbers in remnant wetlands with the potential for disease as a result of overcrowding (Harris and Langenberg 1996).

There has been some concern that the Sarus Crane *Grus antigone* may become the dominant crane species in northern Australia because of its rapid population growth (Archibald and Swengel 1987). Brolgas and Sarus Cranes have also been recorded to interbreed (Archibald 1975). The long-term implications of this are as yet unknown. Should these trends continue, the southern population of the Brolga may become more important for the long-term survival of the species.

### Major conservation objective

The major conservation objective is to protect the Victorian populations by ensuring that they can breed successfully to maintain and increase population sizes, and flock at consistently used sites without disturbance. Specifically:

- To ensure that wetland areas where Brolgas congregate are secured from environmental degradation and inappropriate disturbance.
- To protect existing breeding sites from modification and degradation.
- To restore a minimum of 50 former known breeding wetlands and other sites that have the potential to be breeding wetlands.
- To prevent losses of eggs and chicks by introduced predators.
- To reduce the incidence of chick and adult mortality by man made structures.
- To monitor the population to ensure that changes can be identified at an early stage.

### Previous management action

Research on and captive breeding of Brolgas was initiated by the former Fisheries and Wildlife

Department in the 1960s at Serendip Wildlife Research Station, with regular successful artificial insemination of females. In 1994, 14 pairs were maintained while 25 young were raised (M. Helman *pers. comm.*). A pilot release program of these birds was commenced in 1995 at three sites in western Victoria. These sites were either restored or man-made wetlands. About 15-16 of the 25 released birds are known to be surviving. No further breeding of Brolgas for release to the wild is planned (M. Helman *pers. comm.*).

Breeding and flocking areas were also monitored by Department staff from the 1960s (D. White *pers. comm.*). In the 1970s a systematic survey of Victoria's wetlands commenced and a classification system was developed (Corrick 1982). Known as the *Wetlands Database*, this was completed in 1993.

The **Wildlife Act 1975** provides for the Minister to temporarily close wetlands to hunting at short notice, for management purposes (including the protection of nesting Brolgas). This action was taken in 1983 to protect Brolgas at Two Tree Swamp, Corop (R. Weber *pers. comm.*).

Some wetlands known to be Brolga breeding or flocking sites have been reserved for conservation purposes following the recommendations of the Land Conservation Council's public land review process begun in 1970, and through government land purchases. These wetlands include Tang Tang Swamp, Moodie Swamp, Gaynor Swamp and Two Tree Swamp (R. Weber *pers. comm.*).

Between 1990 and 1994 a wetland incentives scheme operated under the Wetland Conservation Program. Landholders could obtain assistance in the restoration, protection and management of wetlands on freehold land. Under this scheme about 100 wetlands were restored either by drainage control works or fencing to exclude stock. A number of these now provide suitable habitat for Brolgas, and breeding has been recorded on three of these wetlands. (P. Du Guesclin *pers. comm.*).

The *Trust for Nature* has also supported the conservation of Brolga habitat with the acquisition of Tomlinson Swamp in 1996 (R. Weber *pers. comm.*).

An education program on Brolgas has been developed at Serendip sanctuary to provide the opportunity for visitors to learn about the species.

### Intended management action

#### Survey and Monitoring

1. Undertake surveys during the breeding season to locate nest sites, describe nesting habitat, document annual breeding dates (nesting, egg laying, hatching and fledging) and determine

the success of a minimum of 20 nests annually.

2. Count the number of adult, juvenile and first year birds at flocking sites each year.
3. Document the use of flocking sites during drought or unusual seasons.
4. Store population, breeding and flocking information in the *Atlas of Victorian Wildlife* and other appropriate databases.

*Responsibility: NRE (Regions, Parks, Flora and Fauna Division), Parks Victoria*

#### **Research**

5. Undertake banding program including using colour leg bands to mark young Brolgas prior to fledging at selected breeding sites to determine recruitment and movement to flocking sites.
6. Review historic data on breeding and flocking sites to determine former breeding and flocking ranges and population estimates.

*Responsibility: NRE (Regions, Parks, Flora and Fauna Division)*

#### **Habitat protection**

7. Pursue the protection of a minimum of 100 breeding sites and all major flocking areas. This could be achieved by incorporating these sites into conservation covenants or Land for Wildlife properties.
8. Include Brolga breeding and flocking sites in planning overlays for local government planning schemes.
9. Examine the feasibility of planning controls for drainage of wetlands on freehold land.
10. Establish appropriate grazing regimes and review grazing licences on public wetland areas containing Brolga breeding sites.

*Responsibility: NRE (Regions), Catchment Management Authorities, local government authorities, Trust for Nature*

#### **Predator control**

11. Encourage predator control by landowners/Landcare groups around breeding wetlands.

*Responsibility: NRE (Regions), Catchment Management Authorities*

12. Implement predator control around and on public lands which are breeding areas.

*Responsibility: NRE (Regions), Parks Victoria*

#### **Community awareness and involvement**

13. Encourage restoration of shallow and deep freshwater wetlands to increase potential breeding sites.
14. Provide assistance and management advice to landholders who have breeding or flocking sites on their properties.
15. Encourage and promote the covenanting of appropriate land through *Trust for Nature* and promote wetland conservation through the *Land For Wildlife* scheme and the Victorian Farmers Federation.
16. Liaise with other agencies/organisation (eg. Victorian Farmers Federation), to provide education and extension materials on values of wetlands and alternative 'uses'.
17. Use appropriate funding schemes (eg. Landcare) to assist landholders to restore degraded wetlands targeting shallow freshwater marshes, with emphasis on those areas that support or have potential to support threatened species.

*Responsibility: NRE (Regions), Catchment Management Authorities, Trust for Nature*

#### **References**

- Archibald, G. W. (1975) *The Sarolga*. [Unpublished].
- Archibald, G. W. (1981) Introducing the Sarolga. Crane Research around the World. Archibald, G. W. & Swengel, S. R. (1987). Comparative ecology and behaviour of Eastern Sarus Cranes and Brolgas in Australia. *Proc. 1985 Crane Workshop*. International Crane Foundation.
- Arnol, J. D., White, D. M. & Hastings, I. (1984) Management of the Brolga *Grus rubicundus* in Victoria. Department of Conservation, Forests and Lands, Fisheries and Wildlife Service, Victoria. *Tech. Rep. Series No. 5*.
- Beruldsen, G. (1980) *A Field Guide to the Nests and Eggs of Australian Birds*. Rigby.
- Blakers, M., Davies, S. J. J. F. & Reilly, P. N. (1984) *The Atlas of Australian Birds*. Royal Australasian Ornithologists Union, Melbourne University Press: Melbourne.
- Campbell, A. J. (1900) *Nests and Eggs of Australian Birds*. Wren Publishing, Melbourne. 1974 reprint.
- Codd, P. (1992) The Environmental Condition of Waterways and Wetlands in the Corangamite Salinity Region. *Background Report No. 5* to The Corangamite Salinity Forum.
- Corrick, A. H. (1982) Wetlands of Victoria III. Wetlands and Waterbirds Between Port Phillip Bay and Mount Emu Creek. *Proc. Roy. Soc. Victoria* **94**: 69-87.
- DCE (1992) *An assessment of Victoria's Wetlands*. Office of the Environment, Melbourne.
- DSE (2003) "Advisory List of Rare or Threatened Vascular Plants in Victoria - 2003". Department of Sustainability and Environment, Victoria, Australia.

- Emison, W. B., Beardsell, C. M., Norman, F. I., Loyn, R. H. & Bennett, S. C. (1987) *Atlas of Victorian Birds*. Department of Conservation Forests and Lands and the Royal Australasian Ornithologists Union: Melbourne.
- Goldstraw, P. W. & Du Guesclin, P. B. (1991) Bird Casualties from collisions with a 500kv transmission line in south-western Victoria, Australia. *Proc. 1987 International Crane Workshop*: 219-24.
- Harris, J. & Langenberg, J. (1996) Cranes in a Crowded world. *The ICF Bugle*: 22.2 May 1996. International Crane Foundation.
- Hill, R. (1992) *A Data Base of Brolga Grus rubicundus Nest sites in Victoria*. Report to the Dept of Conservation and Environment. August 1992. 8 pp. (unpublished)
- Kevin, P. (1992) Groundwater and Salinity Processes in The Corangamite Salinity Control Region. *Background Report No. 3* to The Corangamite Salinity Forum.
- Main, B. Y. (1990) Restoration of biological scenarios: the role of museum collections. *Proc. Ecol. Soc. Aust.* **16**: 397-409.
- Mansergh, I. & Marks, C. (1993) *Predation of Native Wildlife by the Introduced Red Fox Vulpes vulpes*. Action Statement No. 44 Flora and Fauna Guarantee. Department of Conservation and Natural Resources, Victoria.
- Marchant, S. & Higgins, P. J. [eds] (1993) *Handbook of Australian, New Zealand & Antarctic Birds. Vol. 2*. Oxford University Press, Melbourne.
- Meine, Curt D. & Archibald, G. W. (1996) *The Cranes Status Survey and Conservation Action Plan*. IUCN, Gland, Switzerland.
- NRE (1998) *Atlas of Victorian Wildlife* (electronic fauna database). Department of Natural Resources and Environment: Heidelberg.
- NRE (2000) *Threatened Vertebrate Fauna in Victoria - 2000*. Department of Natural Resources and Environment: Melbourne.
- SAC (1991) Final Recommendation on a nomination for listing: Brolga *Grus rubicundus* (Nomination No. 132). Scientific Advisory Committee, Flora and Fauna Guarantee. Department of Conservation and Environment: Victoria.
- White, D. M. (1987) The Status and Distribution of the Brolga in Victoria, Australia. *Proc. 1983 International Crane Workshop*: 115-31.
- White, D. M. (1992) 1992 Brolga Census. *Brolga News*: 1.

Compiled by Phillip Du Guesclin, Arthur Rylah Institute, Department of Sustainability and Environment.

Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

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