

# Action Statement

Flora and Fauna Guarantee Act 1988

No. 179

## Australian Bustard

### *Ardeotis australis*

#### Description and distribution

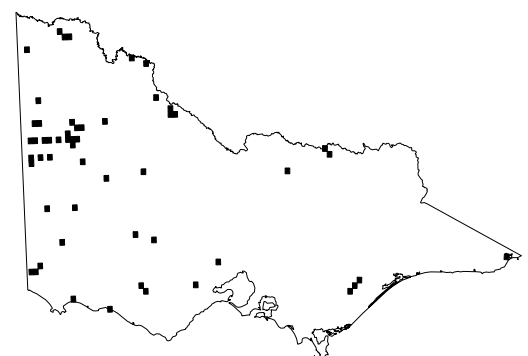
The Australian Bustard (*Ardeotis australis*) is a large, erect, ground dwelling bird with long legs and neck. The male stands to about 80 cm and weighs up to 8 kg. The female is smaller and lighter, standing up to 70 cm tall and weighing up to 3.5 kg. The male has a black crown, whitish neck and underparts with a black stripe across the breast. The back and wings are mid to dark brown with a patch of black and white plumage at the wing bend. The female has a brown crown, narrower breast band and the neck and underparts are greyish. The beak is white or cream and the legs and feet are cream to yellow. Bustards are ground birds and have a stately gait, walking erect with head held high and bill raised. They are powerful fliers but need to run to take flight. They have a wing span of up to 2 m and fly with slow and deliberate wing beats, with their legs trailing and belly appearing to sag (Pizzey and Knight 1999). Eggs are large, approximately 78 mm by 55 mm, olive-green to buff, highly lustrous and indistinctly marked with spots, blotches and streaks of a darker colour.

Male bustards perform an elaborate lek display to attract females during the mating season. The display usually takes place from higher ground in open country so that he is visible from all directions. A white-feathered breast sac is inflated until it almost reaches the ground and is swung from side to side, the wings droop to the ground, tail feathers are fanned forward over the back and the throat is inflated. By expelling the air in the throat sac the male emits a loud roar, easily heard for some distance.

The Australian Bustard was formerly widespread in suitable habitat in all mainland States but its range



Australian Bustard (*Ardeotis australis*)  
(Photo DSE/McCann)



Australian Bustard (*Ardeotis australis*)  
Distribution in Victoria  
DSE (2004)

has contracted markedly due to shooting, habitat degradation and introduced predators. The species is still present in central, northern and western Australia, mostly in remote areas away from settlement. It also occurs on lowland plains in the Trans-Fly region of New Guinea.

In Victoria, it was formerly widespread in grasslands and open grassy woodlands across the Murray Mallee, Victorian Riverina, Victorian Volcanic Plain and Gippsland Plain bioregions (Emison *et al.* 1987, Lunt 1992). It is now rare in south-eastern Australia, occurring as a casual visitor, except for a small, isolated population in southern parts of the Big Desert and adjacent farmland in north-western Victoria (Grice *et al.* 1986, Emison *et al.* 1987). There are few formal breeding records from north-west Victoria, but as juvenile birds are present, it is assumed that breeding takes place.

### **Habitat**

A wide range of open vegetation communities can support populations of the Australian Bustard. These range from tropical to semi-arid and temperate tussock grasslands, open-shrublands and grassy woodlands. In settled areas they visit pasture and crops. Bustards may roost in clumps of trees or on the ground, usually in an elevated position, presumably for protection from predators. Over most of lowland Victoria, the original habitat of extensive tussock grasslands with a suite of herbs between the tussocks has been almost entirely converted to dense swards of introduced pasture grasses or crops. Australian Bustards apparently cannot persist in such environments.

The remnant population in Victoria is apparently unusual in that it utilises semi-arid heath for much of the year, a relatively dense vegetation formation for bustards. However, they often congregate in recently-burnt heath. In winter, bustards can be found in sheep paddocks, lucerne crops and grain stubble adjacent to the Big Desert. Lekking takes place in these more open habitats but females probably return to the mallee heath to nest (D. White *pers comm.*).

In dry years some individuals or small groups are found in farmland further south and east in western Victoria, south to near Hamilton and east to near Geelong (DSE 2003a).

### **Life history and ecology**

Australian Bustards are opportunistic feeders and consume a range of invertebrates, small vertebrates, leaf material, flowers, fruits and seeds. Crickets, grasshoppers, small reptiles and House Mice are common food items (Marchant & Higgins 1993).

Little is known about longevity or population processes, and there is no information specifically from the Victorian population.

Nesting can probably occur at any time when conditions are suitable. Breeding records in the wild in Victoria are few and cover the period October to April with most in January. Captive bustards at Serendip Sanctuary, near Lara, bred between July and December. No nest is constructed; instead the eggs are laid on bare ground amongst tussocks, often near a bush, but with a clear view all round. Clutch size is one or two and incubation takes 24 days. Males do not breed until 5-7 years old, females can breed at three years of age (Marchant & Higgins 1993) but most may not breed successfully until older. Only females participate in incubation and chick rearing.

### **Conservation status**

#### **National conservation status**

The Australian Bustard is not listed under the Commonwealth **Environment Protection and Biodiversity Conservation Act 1999**. It is classified as 'near threatened' in the *Action Plan for Australian Birds* (Garnett & Crowley 2000).

#### **Victorian conservation status**

The Australian Bustard has been listed under the **Flora and Fauna Guarantee Act 1988**.

The Australian Bustard is considered 'critically endangered' in Victoria according to 'The Advisory List of Threatened Vertebrate Fauna in Victoria - 2003' (DSE 2003).

### **Decline and threats**

In southern Australia, the Australian Bustard has been severely reduced in numbers and distribution since European settlement. The historical literature indicates that it was common and widespread in Victoria at the time of European exploration and first settlement. Several explorers and early settlers reported flights of 50 or more in grasslands in the Volcanic Plain, Victorian Riverina, Murray Mallee and Gippsland Plain (e.g. Batey 1883, T. P. Austin in North 1913, Campbell 1883, Lunt 1992). From 1851 to 1870, following the gold rush, the bustard population was greatly reduced in the settled parts, though they were still plentiful in the lesser-used lands further from habitation (Wheelright 1861). From 1870, there was a rapid increase in settlement, with much of the grassland rapidly coming under intensive use for stock grazing. Concomitantly, there was a marked decline in the number of bustards reported, and a significant decrease in the area where breeding could be found (Kearland 1900). By the 1960s it

was unclear whether the species persisted in Victoria. Today, the Australian Bustard is regularly seen only in a narrow band along the southern boundary of the Big Desert, in the ecotone between agricultural land and mallee shrubland and heath, for example in the Wagon Flat area. Occasional birds or small groups are seen in farmland further south and east. The current population in Victoria may be only about 20-30 individuals (D. Venn *pers. comm.*), although Don White (*pers. comm.*) observed up to 18 individuals at one time in the Telopea Downs area.

There are a number of factors responsible for the decline of the Australian Bustard in Victoria.

- Deterioration in the quality of habitat as a result of intensive grazing of livestock, intensive agriculture such as pasture improvement, and clearing of scrub.
- Increased mortality due to use of firearms for hunting. Although hunted by aborigines (Smyth 1878, Presland 1977, Dawson 1881), the arrival of Europeans with more sophisticated weapons resulted in an increase in hunting pressure on the Australian Bustard which rapidly became a favoured game bird (D'Ewes 1858, Wheelwright 1861, Campbell 1900).
- An increased mortality rate due to predation by the introduced Red Fox, Cat and domestic and wild Dogs.
- Widespread use of poisons for rabbit control. From 1880 there were poison carts in every district, sometimes one per grazing property (Kiddle 1961, Stead 1935). Rolls (1969) recounts how bustards died in hundreds in 1882 when phosphorized oats were scattered in the Riverina. The baits may have been eaten directly, or the poison obtained secondarily through mice or insects.
- Susceptibility to disturbance or predation, particularly during the mating display when birds aggregate and evasive tactics may be less effective. Females guarding chicks are also highly susceptible to predators.

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

- in a demonstrable state of decline which is likely to result in extinction; and
- significantly prone to future threats which are likely to result in extinction; and
- very rare in terms of abundance and distribution.

### Major conservation objectives

- To increase the wild population of the Australian Bustard in Victoria through

collaborative, coordinated enhancement of habitat, and strategic predator control.

- To encourage landholders to maintain and enhance habitat in the area currently utilised by the Australian Bustard.
- To monitor the population to determine its geographic distribution, size and trend.
- To determine an appropriate fire regime for the species in the southern Big Desert.
- To conduct a genetic analysis to determine whether the Victorian population is genetically discrete.

### Management issues

Successful conservation of the Australian Bustard in Victoria will require the management of thousands of hectare's of habitat that extends across many parcels of freehold land and Crown land. Therefore, collaboration between private landholders and managers of public land, principally Parks Victoria, will be critical.

### Ecological issues specific to the taxon

The Australian Bustard requires a large home range to provide adequate food throughout the year. Further, home ranges may shift in response to variations in food resources due to climatic variability, fire history or changes in land use. As most original habitat has been removed, the remnant population is now partly dependant upon an artificially-created habitat resulting from agricultural use of the southern fringes of the Big Desert. This area is mostly private land, and changes in agricultural practices are likely. Therefore, long-term security for the species in the area will require careful planning and collaboration to ensure the availability of an adequate range of feeding areas, food resources and secure breeding habitat.

The Victorian population is small (perhaps as few as 20-30 individuals) and may be isolated from other populations to the north (e.g. Grice *et al.* 1986 fig. 4, Barrett *et al.* 2002). Therefore, it is potentially susceptible to all the problems that impinge on small populations - habitat degradation, reduced capacity to recover from stochastic population fluctuations, inbreeding depression, genetic drift etc.

The habitat currently utilised during winter appears to be a result of clearing and partial regeneration. The landscape is continuing to change, either by regrowth to mallee shrubland, or by further development for pasture or cropping. The potential exists for the landscape to be simplified to two basic habitats: improved pasture or cropland, and shrubland. A combination of pasture and shrubby habitats is necessary for

bustards, but these need to intergrade and interdigitate - a 'hard' edge between the two habitats reduces foraging options and provides less cover.

#### **Wider conservation issues.**

The marginal agricultural land where the bustard still remains is subject to wind erosion in dry seasons, and increased runoff has the potential to cause salinization of better agricultural land. Maintenance of habitat, and less cropping and cultivation, will significantly reduce the use of agricultural chemicals, and minimise the risk to a number of threatened invertebrate species that live along the southern edge of the Big Desert. However, without some form of planned management and agricultural utilization, regenerating mallee will take over to the detriment of the Australian Bustard.

#### **Previous management action**

Legislative protection for the Australian Bustard in Victoria was granted relatively early in our history: shooting during the breeding season (defined as Aug-Nov) was prohibited in 1862, and the species received full protection in 1902.

During the 1960s and 70s the Victorian Fisheries and Wildlife Department conducted a major research and captive-breeding project aimed at re-establishing the Australian Bustard in its former Victorian range, including on working farms.

In 1965, 1966 and 1967 expeditions to the Northern Territory collected information on the habitat requirements and behaviour of bustards. Between 1966 and 1969, 31 wild bustards were captured, using a specially developed four-barrelled 'net-gun', and transferred to the Serendip Wildlife Research Station at Lara (White 1985). Other bustards were obtained opportunistically from various parts of the species range, including Northern Territory (4 between 1968 and 1972), Western Australia (Broome - 1 in 1965, Meekathara - 1 in 1966 and the Nullarbor - 1 in 1981), Queensland (Mt Isa -1 in 1967), and Victoria (the Wimmera -1 in 1977). A further 12 bustards from the Northern Territory were added in 1981. These birds formed the basis of a captive breeding population at Serendip which, at its peak in the mid 1980s, contained 78 bustards (White 1985).

Captive-husbandry techniques were progressively refined during a decade of intensive work, culminating in successful breeding by 1976. A special breeding enclosure was designed and constructed for the bustards in 1966 to reflect their specialised handling and breeding requirements. The breeding enclosure is octagonal in shape and covers 3.2 ha. Dividing fences radiate out from a central raised observation hide, and

lower catching pen, like spokes of a wheel, to join the octagonal fox-proof outer fence, forming eight separate enclosures of 0.4 ha. Within the enclosures, low native shrubs and trees were planted in clumps at strategic points to provide the necessary shelter, while lines and belts of similar vegetation screen the entry to the observation hide and the outer perimeter of the enclosures from human disturbance. After 1976, male bustards of breeding age (5 + years) were housed singly to prevent injury through fighting. Small openings in the dividing fences allowed the smaller females to move freely from one enclosure to another to participate in the lek breeding system of this species. Feeding was carried out daily using a specialised diet developed at Serendip, capable of sustaining the birds in breeding condition.

Lek behaviour by males began in 1969 and eggs were first produced in September 1973 and egg laying increased gradually to seven in 1976. At this time the bustard flock consisted of 13 adults - 6 females and 7 males. Three young bustards were hatched in an artificial incubator and successfully hand-reared. From 1977 most eggs were artificially incubated and the juveniles hand-reared. Following removal of eggs to an incubator, females usually relayed, thus increasing production of juvenile bustards. Between 1973 and 1981, 115 eggs were laid, 78 of which were fertile and 52 chicks were reared (White 1985). Some females also reared foster chicks, including four taken from the wild in 1981. By October 1983, the captive population totalled 67 bustards, including some second generation progeny. Over a six year period during the 1980s, 82 eggs were incubated and 48 young were successfully reared and released into the pens. From 1987 to 1990 128 eggs were laid but over half were infertile, a number were taken by ravens or otherwise destroyed, and only 23 hatched. This reduced breeding success was possibly due to the reduced resources available to the bustard program. Although sufficient experience had been gained to produce a regular 'crop' of young birds, the project was no longer seen as a priority by the wildlife agency and the breeding program declined.

The current captive population at Serendip comprises four captive-bred males aged 13-15 years. Melbourne Zoo has a male and female born at Serendip and aged 7 and 8 respectively.

During the 1980s, this captive-breeding program was the most successful for any bustard species worldwide and elements of it have been emulated in the successful captive-breeding and release program for the Houbara Bustard in Saudi Arabia and elsewhere.

Between 1979 and 1984, Don White from the Serendip Wildlife Research Station also conducted

a detailed observational study of wild Australian Bustards in the Telopea Downs area. He documented seasonal occurrence and population numbers, and observed lekking behaviour near Wagon Flat and on Wallowa Downs. At this time, habitat in the region may have been optimal as there were large areas of regenerating mallee shrubland following widescale clearing undertaken during the late 1960s. Paddocks that were not subsequently ploughed and sown provided patchy dense cover intermixed with open grassland, and adjacent lucerne crops provided extra feeding habitat.

Details of Victorian bustard sightings in recent years have been documented and a 'Australian Bustard Observer Record Sheet' has been prepared and supplied to landholders. Contact with landowners in the Telopea Downs and Wagon Flat areas, on the southern edge of the Big Desert, has been established and maintained. The difficulty of finding bustards in this sparsely settled district has made it essential to rely on landowners - those most likely to see bustards in the course of running their properties.

### **Intended management action**

*The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation database. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.*

### **Inventory**

1. Consolidate all recent records of the Australian Bustard in Victoria into the *Atlas of Victorian Wildlife* database.

*Responsibility: DSE North West Region*

2. Expand the landholder liaison program set up in the Telopea Downs area to cover the entire southern fringe of the Big Desert. Organise a series of bustard surveys using volunteers from natural history groups to search for bustards on public land and on freehold land where permission is granted.

*Responsibility: DSE North West Region*

### **Catchment and local government planning**

3. Provide information and advice, including maps, regarding the location and management of Australian Bustard habitat to landholders, land managers and other authorities, especially Catchment Management Authorities and local government authorities.

*Responsibility: DSE North West Region*

4. Incorporate actions to protect, enhance and restore Australian Bustard habitat into relevant Regional Catchment Investment Plans and Biodiversity Action Plans. Implement these actions, according to priority, as resources become available, in conjunction with other agencies, community groups and landholders.

*Responsibility: DSE North West Region, Wimmera and Mallee Catchment Management Authorities.*

5. Incorporate information regarding the location and management of Australian Bustard habitat into local planning schemes, including environmental significance overlays, and apply the Victorian Planning Provisions so as to protect these sites.

*Responsibility: Shires*

### **Co-operative Habitat Management**

6. Establish an informal land management liaison group to encourage landholder participation and collaboration in protection and enhancement of bustard habitat, including cooperative fox and wild dog control programs.

*Responsibility: DSE North West Region*

7. Use existing Government programs such as Bushtender, Bushcare grants and the Land for Wildlife Scheme to encourage private landholders along the southern edge of the Big Desert to maintain a mosaic of grassland, open mallee and low, open heath.

*Responsibility: DSE North West Region*

### **Public land management**

8. Ensure that management of public land in the Big Desert, both conservation reserve and State Forest, is sympathetic to the needs of the Australian Bustard by rapid uptake of the results of the proposed ecological research.

*Responsibility: DSE North West Region, Parks Victoria*

### **Ecological Research**

9. Undertake radio-tracking studies to determine patterns of distribution, habitat utilisation and movements of the remnant Victorian population.

*Responsibility: DSE Biodiversity & Natural Resources Division*

10. Detailed observations of habitat utilisation are required to inform habitat management decisions. An observational study is required to quantify habitat usage by wild birds. This

project may be suitable for a post-graduate student.

*Responsibility: DSE Biodiversity & Natural Resources Division*

#### **Liaison**

11. Liaise with landholders in areas where bustards are currently sighted with the aim of enlisting their support in cooperative habitat management.

*Responsibility: DSE North West Region, Parks Victoria*

12. Liaise with local naturalist groups that may assist in survey and monitoring.

*Responsibility: Parks Victoria, DSE North West Region*

13. Liaise with tertiary institutions that may be willing to jointly develop studies outlined under research.

*Responsibility: DSE Biodiversity & Natural Resources Division*

#### **Education**

14. Develop an education kit for distribution to schools within the present and former range of the bustard in Victoria with a view to increasing awareness.

*Responsibility: DSE North West Region, Biodiversity & Natural Resources Division*

15. Work with schools in the western Wimmera and southern Mallee to increase awareness of the plight of the Australian Bustard in the region.

*Responsibility: Parks Victoria, DSE North West Region*

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

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: <http://www.dse.vic.gov.au>

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