



Preventing and controlling damage by pest animals in Western Australia



Australian white ibis *Threskiornis molucca*

The Australian white ibis (*Threskiornis molucca*) is also known as the Sacred Ibis or White Ibis. It is one of three Ibis that occur in Australia along with the straw-necked Ibis (*Threskiornis spinicollis*) and the glossy ibis (*Plegadis falcinellus*) Marchant and Higgins 1998.

Scaring techniques may be effective as part of a multi-faceted management program. Damage can be controlled via: exclusion with netting and barriers; limiting access to food, water and loafing sites; and preventing people from feeding the ibis.

In extreme cases shooting, and population control via oiling eggs, may be effective in reducing population numbers.



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Identification

Australian White Ibis weigh 1.7-2.5kg and have a wingspan of 110-125cm (Marchant and Higgins 1998). Adults have a large white body, a featherless black head and neck and a long black downward-curved bill (Marchant and Higgins 1998). Adult females weigh 1.4-1.9kg. Adult males are slightly larger than females and they weight 1.7-2.5kg (Marchant and Higgins 1998). Males also have a slightly longer and more robust bill than females (Marchant and Higgins 1998).

The wings are white and the primary feathers of the wings have black tips (Marchant and Higgins 1998). The secondary wing feathers are black and a patch of skin under the wing varies from pink to red (Marchant and Higgins 1998). Several horizontal pink bars on the back of the head are more distinctive during the breeding season (Marchant and Higgins 1998). Chicks have a feathered head

and neck and a short straight bill (Marchant and Higgins 1998). As juveniles mature they lose the head and neck feathers and their bills grow (Marchant and Higgins 1998).

Distribution and abundance

The Australian white ibis occurs in Indonesia, New Guinea and Australia (del Hoyo et al. 1992). This ibis is widespread throughout Australia, excluding the inland arid regions (Marchant and Higgins 1998). Analyses have shown a shift in the population from inland wetlands to coastal and urban environments, where water and food resources are readily available (Ross and Legoe 2006).

Australian populations of Australian white ibis have increased in size over the past 50 years, probably due to an increasing access to human refuse. For example, in the Sydney region, ibis were recorded in low numbers in the 1940s and numbers increased between the 1940s and 1970s (Morris 1983; Keast 1995). Breeding colonies were first recorded in the Royal Botanic Gardens and Centennial Parklands of Sydney in the mid 1980s (Perry 2001). On the Gold Coast in Queensland, the ibis population grew rapidly from an estimated 5,000 to 10,000 between 1995 and 1998 (Brown 1995; Shaw 1999).

The Australian white ibis was not recorded in the Perth Metropolitan area prior to 1946. However, the ibis are now common at Perth Zoo, wetland areas, landfill sites and in suburban areas where people feed birds (Stevenson 2000-2006).

The number and movements of ibis in Perth have not been recorded, but successful monitoring techniques for this species include aerial surveys, colour banding, community surveys, site counts (Ross and Legoe 2006) and radio-tracking (Murray 2006).

The Australian White Ibis was first observed in the rural regions of south-west of Western Australia in 1952 (Blakers et al. 1984). The first breeding record was near Capel in 1979 (Blakers et al. 1984) and since about 1980, local populations have expanded and the species has spread through the south-west (Brown et al. 2005). For example, numbers at Middlesex field centre, Manjimup increased from fewer than 10 in 1974 to more than 200 in 1994, but fell by 10% between 1994 and 1999 (Brown et al. 2005).

Biology

The natural breeding habitat of Australian white ibis is inland wetlands, where they often form mixed colonies with Straw-necked Ibis (Marchant and Higgins 1998). Australian White Ibis nest in colonies in trees, shrubs or on the ground where nests can be

protected from predators (Marchant and Higgins 1998). Ibis breed from June to March, but can breed year-round in areas where resources are abundant. Australian white ibis lay 1-5 eggs and 3-4 of the eggs hatch after 21 days (Marchant and Higgins 1998). Both parents feed the chicks and after three weeks, crèches form until fledging at about 48 days (Marchant and Higgins 1998). Young birds are believed to disperse widely (Carrick 1959; Marchant and Higgins 1998), but in urban habitats, ibis are more sedentary. For instance, banding records show that a female Australian white ibis banded in the Royal Botanic Gardens in Sydney in 1991 was recorded in the same location 11 years later (Anon. 2003).

Ibis feed around marine and freshwater wetlands and wet grasslands (Marchant and Higgins 1998). In their natural habitat they eat mainly aquatic invertebrates such as freshwater crayfish (Carrick 1959). They also feed on crickets, fish, snails, frogs and snakes (Carrick 1959). In south-west Western Australia, ibis feed extensively on the introduced dung beetle and their larvae.

In urban areas, Australian white ibis are scavengers, eating any form of organic matter at land-fill sites and recreation areas (Ecosure 2004b).

Habits

The Australian white ibis is a scavenging species with a generalised diet. It has been able to adapt well to urban environments. Ibis scavenge at land-fills and recreation areas, consuming almost any type of food.

Colonial breeding birds such as ibis depend on a supply of fresh water and food. These resources are commonly available at landfill sites, inflating local population sizes (Shaw 2006). A study in Queensland for example showed that a landfill site provided 70% of the food supply of the local ibis population (Shaw 1999).

Grassed areas are attractive to ibis, particularly during and after mowing. Mowing kills and/or exposes the invertebrates and small vertebrates on which the ibis feed (Ecosure 2004b). Rain forces small animals to the surface and dry grasslands can expose the soil, both making sites attractive for feeding by ibis (Ecosure 2004b). Ibis are also attracted to foraging sites along the edges of waterways, shallow water bodies and tidal estuaries (Ecosure 2004b).

Damage

Increasing ibis populations have led to a variety of problems in many segments of society, including aircraft strike, faecal contamination and the reduced survival of seabirds (Smith and Carlile 1993).

Nuisance

The presence of ibis colonies leads to complaints from the public relating to noise, smell and unsightliness (City of Bankstown 2004). Local residents can be kept awake at night by the noise of nearby colonies in recreation areas (City of Bankstown 2004). In addition, ibis can compete with captive animals for food in wildlife parks and zoos (Temby 2003).

Health

An epidemiological study showed that ibis carry a range of pathogens that are transmissible to humans (Epstein et al. 2001).

Ibis carry *Salmonella spp.*, but there are no records of human disease being attributed directly to ibis as a source (City of Bankstown 2004).

In recreational areas, where people feed birds, ibis can cause minor injuries to humans when they attempt to procure food from humans (City of Bankstown 2004).

Aircraft safety

Because they are large birds that occur in large flocks, ibis have the potential to cause serious damage to aircraft. Between 1991 and 2001, 39 bird strikes involving ibis were reported to the Australian Transport Safety Bureau (Australian Transport Safety Bureau 2002). Of these, 41 per cent caused aircraft damage, 18 per cent affected the planned flight and 18 per cent involved more than one bird (Australian Transport Safety Bureau 2002).

Jet aircraft are most susceptible to strike by ibis due to the large surface area of the jet engines, while helicopters are least at risk (Australian Transport Safety Bureau 2002). On Christmas Eve 1995, an Australian White Ibis flew into the engine of a QANTAS Airbus, costing an estimated \$8 million in repairs and downtime (Shaw 2006).

Fouling

In recreation areas, the presence of large numbers of ibis commonly results in fouling of paths, park benches and other structures such as statues with faeces (City of Bankstown 2004).

Biodiversity

Large numbers of ibis nesting in one location can damage vegetation. For example, a study in Victoria found that vegetation died as a result of excreta covering leaves which resulted in defoliation (Kentish 1999). Collection of large amounts of nesting material by breeding ibis can also damage natural vegetation habitats (City of Bankstown 2004).

Nesting densities of 1,911 nests per hectare have been recorded in Bankstown, NSW and this may result in competition with native species for food and nesting resources (City of Bankstown 2004), although the impact of this competition is difficult to quantify.

Environmental law

Commonwealth

The Australian white ibis is listed as a Marine Species under Section 248 of the *Environment Protection and Biodiversity Act 1999*. Thus, it is an offence to intentionally or recklessly kill, injure, trade, keep or move them in Commonwealth lands or waters unless authorised by a permit issued under Section 258, or it was reasonably necessary to prevent a risk to human health (Section 255). A permit to kill, injure, take, trade, keep or move a member of a listed marine species in or on a Commonwealth area may be obtained from the Department of the Environment, Water, Heritage and the Arts by filling out an application form.

The applicant must demonstrate that due process has been followed prior to applying for such a permit. Thus the applicant would have to demonstrate that all reasonable non-lethal methods have been

attempted, assess the environmental impacts of culling and obtain a permit to cull prior to undertaking population control.

State

Australian white ibis are indigenous to Western Australia and as such are protected under the provisions of the *Wildlife Conservation Act 1950*. They may be taken only with a licence issued by the Department of Environment and Conservation. Licences to take are generally issued only after other methods have been employed as part of a co-ordinated management program.

Damage Prevention and Control

Experience from other states shows that once an ibis colony has become established, a long-term management strategy is needed to manage the damage they cause.

Exclusion

Exclusion of ibis from sites such as landfill sites, sewage treatment ponds, recreation areas and airports can significantly reduce their use of the area. All landfill sites in the region must be managed to reduce ibis numbers.

Netting, of the kind that is used to protect fruit crops, is effective for excluding ibis from landfill sites (Patrick 2006). For example, at Ballina in NSW, 9m high nesting was used to cover a 2ha landfill area (Patrick 2006). The netting resulted in a significant reduction in numbers of ibis at the landfill site, based on roost counts (Patrick 2006).



Figure 1 Sign discouraging people from feeding the birds (photo © Tamra Chapman / DEC).

Nylon monofilament lines of 50kg breaking strain installed parallel at 3-4m spacing up to 6m overhead can exclude ibis from food service areas. Wires are also effective if used in combination with lidded bins and umbrellas over dining tables.

Heavy duty plastic strips have been used successfully to exclude ibis from netted eating areas in a wildlife park (Shaw 1999). At the same site, popped grain which is very attractive to ibis, was replaced with lucerne chaff as a food for patrons to feed to macropods (Shaw 1999).

Bins with lids deny ibis access to food and should be used throughout areas where ibis are likely to be a problem. This includes restaurants, fast food outlets, recreation areas, schools, shopping centres, factories and food processing plants. It is important to ensure that a sufficient number of bins are available and that bins are emptied regularly to ensure that they do not become over-filled. This is particularly important in recreation areas and schools and should be combined with an education campaign to prevent people feeding ibis.



Figure 2 Netting over an active cell at Ballina Landfill (image from Patrick 2006, pg 41).

Habitat modification

Maintaining grass to around 30cm in length can make it difficult for ibis to access invertebrates and see predators (Ecosure 2004a). Reducing the frequency of mowing or mowing at night can have a similar effect (Ecosure 2004a). However, the efficacy of this should be reviewed, since tall grass can attract rodents and the birds of prey that feed on them and the latter may pose a hazard to aircraft (Ecosure 2004a).

Filling in depressions that hold water or engineering drainage channels can remove water from the site (Ecosure 2004a). Drainage channels may require wires, netting or covers to restrict access (Ecosure 2004a). Channels must have steep sides (at least 4:1) and deeper than 0.5m to prevent ducks feeding on the bottom (Ecosure 2004a). Removal of exotic plant species in which ibis nest, such as Cocos Palm and Bougainvillea, can prevent nesting in an area (Shaw 1999).

Behaviour modification

Feeding of food scraps to ibis should be strongly discouraged using signs and other educational materials (Temby 2003). In recreational and outdoor eating areas, food scraps should be wrapped and placed in a bin immediately.

Employees in the workplace and members of the public must be educated on the disadvantages of feeding ibis (Temby 2003),

including the harmful effects of feeding ibis. These are likely to include fouling and pollution of water with food and droppings, inappropriate foods for the birds, harassment of people for food, artificial increase in the population and increased risk of disease (Temby 2003).

Scaring

Scaring of ibis can be effective if used as part of a multi-faceted management program. Explosive cartridges, distress calls, sirens, lights and vehicles can be used to disperse ibis (Ecosure 2004a).

Spotlighting has been used to disperse ibis from areas where they nest with other birds, but the ibis can become accustomed to it (Shaw 1999). However, spotlighting may be successful in the long-term if combined with other scaring techniques (Shaw 1999).

Shooting

Occasional shooting may be needed to reinforce the impact of dispersal techniques. Firearms must be licenced, shooting must be conducted under the conditions of the licence and should reflect the national guidelines for Shooting of Pest Birds (Sharp and Saunders 2004b).

A shot to the brain, using a 12 gauge shotgun, is preferred when the bird is in close range i.e. less than 20 metres (Sharp and Saunders 2004a). If the bird is more than 20 metres from the shooter, a chest shot using a large calibre centre fire rifle (e.g. .243) should be used (Sharp and Saunders 2004a).

Population control

When food is abundant, ibis can have three clutches per season and fledge 1.4 chicks per nest (Lowe 1984). Nesting can also occur in undesirable areas like airports, schools, shopping centres and private residences (Martin et al. 2006).

Removal of nests and eggs can be an effective method of population control, but requires access to nests and eggs, which is often difficult (Shaw 1999). In addition, the ibis can quickly overcome removal of nests by re-nesting in a nearby location (Shaw 1999).

Egg pricking and 'egg oil' are more likely to be successful than removal, because the adults will continue to brood the eggs and will not re-build the nest or lay another clutch (Martin et al. 2006).

Spraying eggs with canola oil is 99-100 per cent effective in preventing hatching, regardless of time in the breeding cycle it is applied (Martin et al. 2006). The oil clogs the pores of the egg, causing asphyxiation of the embryo (Martin et al. 2006). Around 5ml of canola oil is sprayed on each egg (Martin and Dawes 2005) and optimal frequency of application is once every 18 days (Martin et al. 2006). Parent birds continue to incubate non-viable eggs for an average of 16 days longer than the normal incubation period (Martin et al. 2006).

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