

Ibis in Urban Sydney: a Gift from Ra or a Pharaoh's Curse?

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ABSTRACT

Ancient Egyptians deified Ibis and, in common with the farmers in western New South Wales, saw them as allies in the fight against pestilence. However, successive years of drought and reduced river flows in the west may have driven the Ibis east where they have taken advantage of poor urban waste management practices and the community's "need to feed" friendly birds. Ibis have established viable colonies in urban areas with population numbers in the thousands. The Australian White Ibis *Threskiornis molucca* population in metropolitan Sydney has increased considerably over the past 15 years. The impact that this increase has had on other wetland species has largely gone unmeasured. Information available on the success of this species in urban environments is scant although there is documented evidence on the impact of Ibis and other large wetland birds on wetland habitats. The long-term viability of urban wetlands relies on the ability of managers to balance aesthetics and conservation on the one hand, with recreational land use issues on the other. Next to the management of human recreation, the management of problem fauna, including native species that have the potential to impact on aesthetics or conservation values of these habitats, is foremost.

Key words: urban pest, white ibis, bird feeding, urban wetlands.

Introduction

Sacred or Australian white Ibis *Threskiornis molucca* is a medium-sized wetland bird. Males can weigh up to 2.5 kg, with a wingspan of 110 to 125 cm. Females are generally smaller and weigh up to 2 kg. Sexes are similar with long downward curved beak. Clutch size ranges from one to six eggs, with a mean breeding success of about 1.73 young fledged per pair (Marchant and Higgins 1990). The species nests colonially but forages separately, or in small flocks. These Ibis are generally nomadic although they are known to undertake large migratory movements with distances up to 3218 kilometres recorded (Carrick 1962).

Pharaoh's Ibis in Egypt

Sacred Ibis are often associated with ancient Egypt. Indeed, Ibis were common during the time of the Pharaohs and many were mummified and entombed along with dead pharaohs in the Valley of the Kings. Ancient Egyptians deified the bird as the Ibis god, Thoth, who was usually depicted as an Ibis-headed man or as a full Ibis. It was thought that the crescent-shaped beak of the Ibis linked the bird to the moon. Ancient Egyptians believed that before the dead could enter the Afterworld, their hearts were weighed against a feather of truth to determine whether they had led good and honest lives. In his role as scribe, Thoth recorded the results of each judgment.

Ibis as an urban pest in Sydney

Arnold McGill, a widely known bird observer, was one of the first ornithologists that noted the appearance of Ibis around Sydney. He recorded that they were rarely seen. In the early 1970s, 6 to 10 pairs were released into

the grounds of Taronga Zoo (NPIAW 1985) where they successfully multiplied. In 1992, Ern Hoskins (1992) wrote of the Ibis that: "They have been nesting in the zoo grounds for a number of years and have extended their range to the Botanic Gardens and Centennial Park where they breed, and other locations close to Sydney Harbour. They are domesticated in these areas and will take food from one's hand. It remains to be seen whether these birds eventually cohabit with wild birds to form nesting colonies in other parts of Sydney, or the wild birds take up the domesticated species to their breeding grounds in the inland swamps." Currently no data exist to answer Ern Hoskins' question, but with the Ibis population currently in its thousands, one suspects that they have chosen cohabitation!

It has been suggested that the release into the Taronga Zoo was responsible for the large number of Ibis in Sydney today (NPIAW 1985). Although the release may have contributed to the gene pool at the time, it is doubtful that these few birds could be the founder stock of the large resident population of Sydney.

Nowadays, *T. molucca* is a common occurrence in the region. This species is relatively common around the larger wetlands and parks within the Sydney region, but this was not always the case. In 20 counts conducted by Arnold McGill in the Hawkesbury marshes between 1940 and 1952, Ibis was seen on only four occasions.

Throughout south-eastern Australia, urban populations of *T. molucca* have increased substantially since the early 1970s. Anecdotally, the increase may have been a response to inland drought with an accompanying relocation to coastal areas. This also appears to be the case with the current inland droughts.

The diet of *T. molucca* consists mainly of aquatic invertebrates and crustaceans (Carrick 1959). However, these highly adaptive birds now have access to landfill sites, rubbish bins in parklands and discarded human food. There is little doubt that they are supplementing their natural diet with this novel, artificial food source (Shaw 1997). The associated availability of non-seasonal food sources has led to increased fecundity, decreased emigration and extended breeding season, which have in turn accelerated the population increase.

The capacity for local Ibis populations to increase rapidly is clearly indicated from field counts (Morris 1983) (Figure 1); counts of foraging Ibis at airport sites (Shaw 1997) (Figure 2); and from studies carried out in nesting colonies (Kentish 1999) (Figure 3). The increase in Ibis abundance within urban areas and, in particular, adjacent to airports, has attracted a great deal of attention. With such close community scrutiny, three main issues concerning the establishment of Ibis colonies in Sydney have been identified. Urban planners, and those responsible for the site selection of airports, often chose to resume "waste wetlands" or swamps. Coincidentally, these are also the preferred habitats

of Ibis (sites with trees of dense canopy and closed shrub layer, close to water). The adaptive ability of Ibis has enabled them to take advantage of changes that brought about the local extinction of other less adaptive species. Now, placed close to constant food resources, and with ideal nesting habitats free of competition, the Ibis colonies adjacent to major airports are set to expand. In such situations, where *T. molucca* nest in wetlands close to airports, there is an increased risk of bird strike when flocks move between feeding and nesting areas, or when the young, which are less manoeuvrable, fledge. In recent years there has been at least two reported bird strikes involving collision between Ibis and commercial aircraft. The resultant damage after ingestion of an Ibis into a jet engine generally leads to the replacement of the engines worth millions of dollars (Australian Transport Safety Bureau 2002).

Significant community concerns over air safety have driven government conservation agencies into management mode. The control of an Ibis colony adjacent to Sydney Airport in the 1990s resulted in an 80% decrease in the number of *T. molucca* foraging in the airport environs with a marked reduction in associated air navigation risks (Ross 2000).

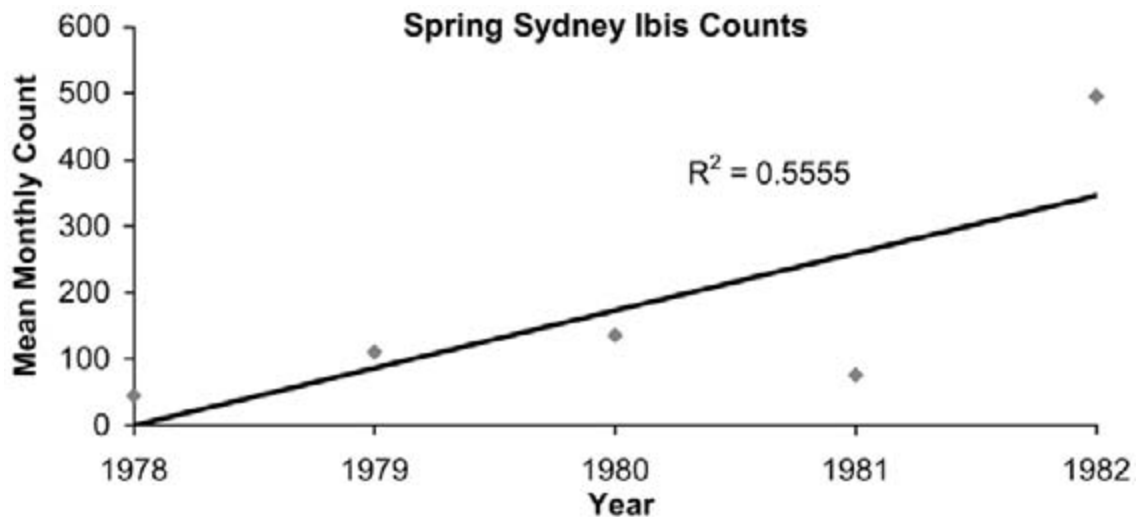


Figure 1. Spring Ibis counts in Sydney from 1978 to 1982 showing a steady increase in population size ($R^2 = 0.56$). Data from Morris (1983).

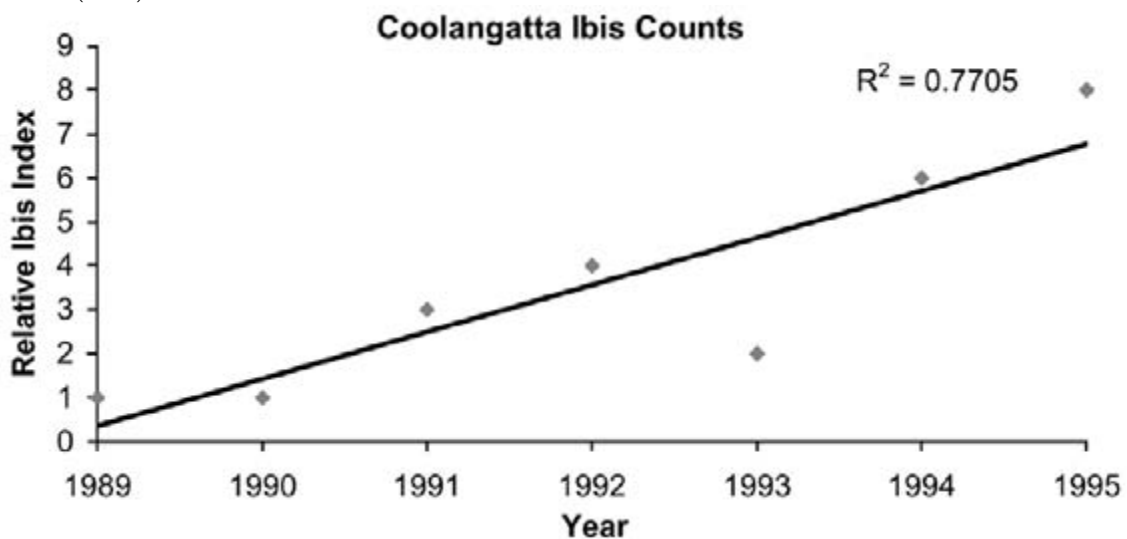


Figure 2. Mean Counts of foraging Australian White Ibis at Coolangatta Airport, 1989 to 1995 showing increasing abundance ($R^2 = 0.77$). Data from Shaw (1997).

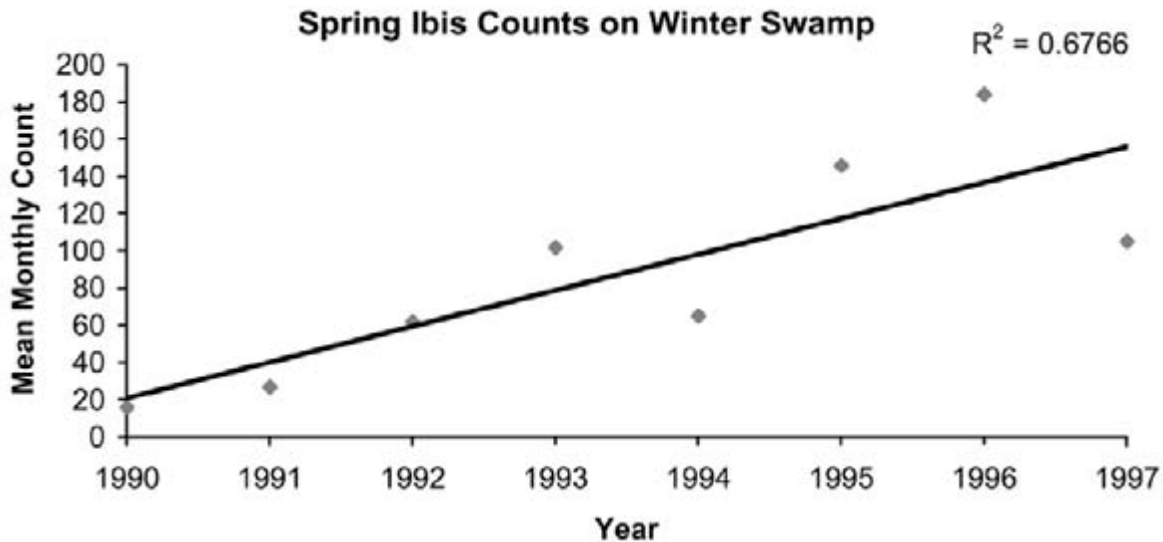


Figure 3. Counts of Australian White Ibis from September to November (Spring) at Winter Swamp, Victoria. The increase in population size over the seven year period is indicated by the positive slope of the regression line ($R^2 = 0.68$). Data from Kentish (1999).

Ibis and other large waterbirds are known to have long-term impacts on wetland vegetation when roosting or nesting. This is the result of physical damage caused by the birds stripping the plants for nest material, or from chemical “poisoning” caused by the deposition of large amounts of nitrogen and phosphorus into the soil or wetland (Kentish 1999, Baxter and Fairweather 1994, Briggs and Thorton 1995). Areas that may initially be well vegetated are left barren and denuded by the end of the season. The impact of the nesting colony not only extends to vegetation, but the presence of nesting Ibis in the wetland may affect other animal species. In one remnant rainforest patch in Southern Queensland, there was a marked resurgence in numbers of the endangered Richmond Birdwing Butterfly after nesting Ibis were removed (Shaw 1997).

Although no evidence of the potential for zoonotic disease transmission from Ibis to humans and domestic animals has been demonstrated, community concerns about the possibility have spawned research in this area. In a study that was conducted on the Queensland Gold Coast in 1994, it was shown that foraging Ibis alternated between garbage tips and human recreation areas. Of a sample of the local Ibis, 3% carried *Salmonella*, a potential food poisoning pathogen (McKee *et al.* 2000). The organism is excreted in Ibis faeces, and faecal material may be transmitted to humans by contamination of picnic tables and similar surfaces. However, no cases of salmonellosis associated with Ibis contamination have been reported. Other studies conducted on *T. molucca* showed that 5% of the birds carried *Salmonella typhimurium*, 5% carried *Vibrio cholerae*, and 30% carried avian haemoprotezoa. Although the sample sizes were low ($n=85$), comparison between surveys conducted two years apart showed an increase in sero-prevalence of Newcastle disease virus (NDV) from 5% to 30%, and in Avian Influenza (AI) from 5% to 40% (McKee 2002).

In their natural environment, Ibis are nomadic, moving from wetland to wetland in search of invertebrates and

other crustaceans that form the bulk of their diet. In urban areas, such as Centennial Park in Sydney, these birds can become quite aggressive, often harassing people for morsels of food. In the late 1980s at Taronga Zoo, I witnessed an adult Ibis harassing a young child. The bird held one end of a large hotdog, the other end was in the hands of the child. A tug-of-war ensued, which the child subsequently lost, and the bird devoured the entire 25 cm sausage in one gulp. This tenacious behaviour demonstrates the persistent nature of this species.

The increasing Ibis population size and expansion of their range into coastal habitats and urban environments therefore places them into conflict with human communities which highly prize the recreation provided by these urban wetlands. Once established, breeding colonies of Ibis are particularly difficult to manage.

In contrast to their ‘pest’ status in coastal urban areas, in rural areas west of the Great Divide, Australian White Ibis are highly regarded by farmers. Here they assist by taking freshwater crayfish (*Cherax* spp.) from irrigation canals and dams and are reported to feed on plague locusts *Chortoicetes terminifera* alongside Straw-necked Ibis *Threskiornis spinicollis* (Carrick 1959).

Management of Ibis in Urban Sydney

Before embarking on an all-out response to managing Ibis locally, there is a need to consider the status of the entire population. Periods of drought reduce or prevent nesting in wetlands of western NSW, Queensland and Victoria, leaving the coastal populations to reproduce. Monitoring inland waterbird populations provides information for population management on a local scale. Given good seasons on the coast, Ibis numbers may increase substantially. A study, conducted by the Ibis Management Coordination Group on the Gold Coast, found that local Ibis populations are capable of a fourfold increase in size over a five-year period, with the rate of increase of one Ibis colony assessed at 35% per year (Figure 2).

Seventy per cent of these birds foraged at landfill sites (Shaw 1997). Another species that fared well, with large numbers feeding at landfill sites, is the Silver Gull *Larus novaehollandiae*. Smith and Carlile (1993) proposed that effective management of landfill sites would reduce the Silver Gull populations around Sydney and this would, undoubtedly, reduce resources for *T. molucca*.

Attempts to reduce Ibis populations by culling alone has met with little success. In the long-term, changes in the way we handle waste at landfill sites will be the key for effective management of Sydney's Ibis population. Other successful methods for the local management of the species include egg removal, and pricking eggs that are then left in the nest. The most effective method, especially where nesting occurs in highly urbanised areas (generally associated with palm trees), is the complete removal of nests and nesting material. Ibis nesting for the first time will often utilise the nest material of earlier nesting pairs (pers. obs). Removal of this material reduces the ability of nesting pairs to form their nests.

Future Work

Future research should focus on the assessment of the overall abundance of Ibis within urban Sydney and a comparison of the results with earlier surveys. To better understand the relationship between the coastal urban populations and those of western NSW, additional work needs to be conducted on the genetics of the broader population. Examining genetic variability may also clarify the origins of the Sydney population. These data would provide for an assessment of the significance of the urban residents as a source pool for inland populations.

Comparatively little is known about the regional movement of the birds. In a preliminary study undertaken by Perry (2001), it was suggested that using satellite tracking, radio telemetry or colour banding to examine the movements of Ibis would shed light on how they use the environs of regional Sydney. Finally, an examination of the health status of the Ibis population in Sydney is currently underway and this may lead to improved conservation management of this species and allow us to capitalise on this gift from Ra.



Top left: Nesting Ibis in Botany Wetland. **Top right:** Ibis show a strong tendency to nest in palms (Family Palmae). Wetland vegetation is trampled to provide favourable nest platforms. **Bottom left:** Ibis obelisk. Centennial Park, 2001. **Bottom right:** self-made Ibis statue. Photos: G. Ross

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QUESTIONS & ANSWERS

Ian Temby: What would you put down as the major reasons for population increase in the Ibis?

Geoff Ross: One of the biggest reasons that Ibis seem to have increased in Sydney is the greater availability of habitat, larger areas for foraging: golf courses; larger green space, if you like, without trees; and the availability of refuse tips. Some of the tips around Sydney are still not covered and they enable Ibis to forage there. That is one of the reasons, the greater availability, and access to, food, than they have ever had before.

Carla Catterall: As part of a study north of Brisbane, we counted Ibis in the early 1990s. It was a monitoring program in a new development. The Ibis numbers went up from about 1990 to 1996-97, and then went down again. I attributed some of that fluctuation to the fact that in the early 1990s there was a very dry period in the west, and then when the rain came, the Ibis moved back again. Have you seen anything like that in Sydney?

Geoff Ross: That is what I originally thought about the Ibis populations in Sydney. It is quite possible that all of the Ibis are from those seven pairs initially released from Taronga, but I suspect that it is more likely that a lot of Ibis came east during the droughts of the late 1970s and early 1980s, which is when the number of Ibis in the Sydney region increased. But with the greater food availability here, I think a lot of them stayed.