



The status of herons and their wetland habitat in southeastern Australia, 2000-2010

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Abstract

This paper presents an update on the status of herons in southeastern Australia from 2000 to 2010, with emphasis on the situation in the Murray-Darling Basin river system. During the period, four major studies contributed to an enhanced understanding of heron biology and conservation of herons in Australia. In the Lower Hunter Region of New South Wales, Rufous Night Herons (*Nycticorax caledonicus*) have not been recorded as a breeding species following the destruction of their colony site in the 1980's. Since 2000, there has been little action with regard to the conservation of the Australasian Bittern (*Botaurus poiciloptilus*), listed as Endangered by IUCN and as Critically Endangered by the Heron Specialist Group. The federal government listed the species as nationally Endangered in 2011, but otherwise, little has been done to stop habitat destruction of specific sites. Two studies of the Cattle Egret, the Lockyer Valley Cattle Egret (*Ardea ibis*) study and the Project Egret Watch study of the two Lower Hunter colonies (Seaham and Shortland colonies) provide considerable information on the changing status of this species. Nesting populations in the Lower Hunter Valley decreased precipitously as critically important wetland sites became adversely affected by development pressures. The Murray-Darling river system traditionally provided major support of nesting and year round activities of the four species of egrets, three of bitterns and three of other herons, as well as other waterbirds. Drought and bad water management created water shortages and adversely affected heron numbers through 2006. Thereafter, overall favorable conditions for breeding and foraging returned and threats from water management were substantially reduced. Despite nesting success in response to floods and recent moves by some rural property owners to be proactively supportive of the water birds, the overall assessment is of a bleak future for Australian herons due to lack of governmental and popular support for sound environmental policies. The situation is still volatile due to continued political conflict and a finding in a new study released as this report was going to press that previous estimations of flooding extent in the basin had been over estimated.

Key words: *Ardea*; *Botaurus*; conservation; egrets; *Egretta*; Murray-Darling; New South Wales; *Nycticorax*; populations; wetlands.

Introduction

Maddock (2000) summarized the status of herons in Australia as part of a global assessment of heron conservation (Kushlan and Hafner 2000). The purpose of the present paper is to provide an update of the breeding populations of key species through the end of the first decade of the 21st century. This update discusses the current status of the populations, the habitat on which they depend, and the complex socio-economic and political influences that have affected them.

Maddock (2000) concluded that there was a decreasing trend in breeding numbers of Eastern Great (*Ardea modesta*), Intermediate (*Ardea intermedia*), Little (*Egretta garzetta*) and Cattle (*Ardea ibis*) egrets in coastal New South Wales (NSW) colonies and recommended that conservation status of the Great, Intermediate and Little Egrets should be raised to vulnerable. He suggested that the erratic nature of breeding of the Rufous (Nankeen) Night Heron (*Nycticorax caledonicus*) in its major nesting areas in the Murray-Darling Basin and the continued overall decline of the water regime of the basin could have long term consequences for its population. He also noted that very little was known at that time about the Australasian Bittern (*Botaurus poiciloptilus*). He pointed out the serious plight of the water regime of the Murray-Darling Basin, historically a major breeding area for herons and other waterbirds, and discussed its associated controversies and the resultant decline in waterbird nesting.

The present contribution documents that the situation has worsened since that 2000 paper. The precipitous decline in the egret nesting population in the Hunter Region of NSW is continuing as part of a general pattern of ecological degradation of wetlands. The further catastrophic collapse of the Murray-Darling ecosystem due to political and sociological antagonism is to be an-

anticipated.

Results and Discussion

Significant studies. Since 2000, four major studies have expanded the knowledge of heron biology and conservation.

McKilligan (2001) studied Cattle Egret nesting in the Lockyer Valley, Queensland. Cattle Egrets started nesting in the area in the 1974/75 season. The study encompassed the 20 years from 1979 to 1998 and is an important example of the value of long-term research in understanding processes at work in controlling fluctuations in numbers of nests and breeding success.

McKilligan (2005) filled a gap in Australian literature. This was the first book to deal exclusively with the 14 Australian species of Ardeidae, covering distribution, movements, feeding, breeding, population dynamics and conservation. The publisher's description of the book on the back cover described the chapter on population and conservation as a useful summary of the status of the species, some thriving and others in a very precarious position, with northern Australia accommodating large numbers of certain species, but the southern half of the continent having some species which had become very scarce and were at risk of local extinction.

Maddock (2008a) provided a comprehensive historical review of the growth of the Seaham and Shortland nesting sites from their establishment in the late 1970's onwards until 2008. The report details the record of the rise of the Great, Intermediate, Little, and Cattle egrets until 1989, followed by a short, rapid downward plunge between 1989-1995, and then a fluctuating but overall declining trend thereafter (a warning trend that the tipping point to local extinction may have been imminent). It includes a mapping

of the changes over time of nest locations within the two colonies and an analysis of the possible impacts on the declining egret nesting populations by a steadily increasing White Ibis nesting population which began at Shortland in 2004. It also reviews the changes in the Straw-necked (*Threskiornis spinnicolis*) and White Ibis (*Threskiornis aethiopicus*) populations, which share the same wetland habitat with the egrets.

Maddock (2008b) provides a comprehensive historical review of the literature and monitoring data on the conservation issues involved in the continuous decline in ecological characteristics of Lower Hunter (NSW) regional wetlands for more than 200 years. Natural estuarine shorelines and floodplain wetlands have been altered, destroyed, drained, filled and severely degraded for industrial and urban development to the detriment of flora and fauna, a process which accelerated from the 1970's onwards. The degradation occurred in both protected reserves and unprotected areas alike. It resulted in negative impacts on key, highly threatened species which require essential interactive ecological processes across a wide range of sites and disrupted critical conservation management effort. In recent years, failed and ecologically inappropriate compensatory offset projects have become the norm. Case studies include the Australasian Bittern as well as other waterbirds and demonstrate the vital role of maintenance of the wider wetland ecological system for all species and all phases of the life cycle of these birds. Photographic evidence illustrated the progressive degradation of the ecological characteristics of both the Seaham and Shortland wetlands up until 2008.

Rufous Night Heron. Maddock (2008a) concluded that the status of the Rufous (Nankeen) Night Heron in the study area was somewhat obscure. The loss of the nesting colony on Kooragang Island in 1972 resulted in a significant decrease in night herons in the Shortland Wetlands

area from that time through the 1980's. Limited data available suggests a moderate recovery in numbers at the Wetlands Centre, but not to the levels prior to 1972. No nesting has been recorded anywhere in the Lower Hunter Region since the demise of the original Kooragang colony. The results from regular monitoring of Rufous Night Heron numbers at Wallbridge Reserve, Raymond Terrace since 2003, taken in conjunction with records of the herons present in the Shortland egret colony during the nesting seasons, pointed to an annual departure of the birds from the region to an unknown breeding site or sites elsewhere. The Murray-Darling system would have to be a prime candidate as their destination.

Despite regular monitoring for the presence of Rufous Night Herons during the Shortland egret nesting season (nest counting 1981/82-2009/10 and the annual program of wing-tagging egrets 1995-2004), no nests were discovered, although the species was regularly seen and recorded in evening observations during winter, often in large numbers. In the 2009/10 nesting season, 7 nests were located in tall trees on a property adjacent to the Shortland colony, reported as "the first confirmed nesting for several decades" (Stuart 2009, p. 27). However, no nesting was located in the 2010/11 season.

The weekly monitoring program was maintained during 2001-2010 at the Rufous Night Heron day roost site at the Wallbridge Reserve, a local council reserve at Raymond Terrace near the junction of the Hunter and Williams Rivers. It revealed that numbers fluctuate year to year but in general show a pattern of low numbers in January-April increases over the winter months, June-August, and then declines again to the end of the year. The highest maximum number on record was 85 in November 2004, the next highest 66 in October 2008. This was followed by a collapse to 17 in October 2009 and 12 in September 2011.

A small number of juveniles were recorded present at the roost at various times in the year and adults in nesting plumage were present towards the end of the year. In 2006, a few birds were observed displaying typical heron courting behavior when 40 were present in November; but no nesting eventuated. The number present in December dropped to 14 and very few were recorded in early months in 2007 (January-July ranged 0-7). The 11 years of data are yet to be evaluated against the rainfall records and the species is still largely an enigma. As McKilligan (2005) stated, "the breeding behavior of Nankeen [Rufous] Night Herons is poorly known."

Australasian Bittern. The Australasian Bittern is listed as Endangered by IUCN and as Critically Endangered by the Heron Specialist Group (Kushlan and Hafner 2000). The Heron Conservation Action Plan stated that precise information on populations occurring at individual sites was virtually non-existent (Kushlan 2007). The plan stated the urgent need to clarify the distribution and population, identify the most important sites for its conservation, create awareness and provide information to local people, implement strict protection of species and sites and provide for a comprehensive monitoring plan.

There has been little action to adequately attend to these issues since 2000. Roger Jaensch (in McKilligan 2005, p. 20) stated that the species had probably declined markedly in the Murray-Darling Basin over the last 50 years due to extraction and regulation of water flows. Records were of infrequent, small numbers and scattered between protected and unprotected wetland sites causing Bittern dependency for survival on small wetland patches.

Maddock (2008b) found that serious negative impacts had affected the Australasian Bittern in the Lower Hunter region. Reclamation work to develop the Kooragang Island Industrial Site in

the 1970's destroyed 616 ha of wetland habitat, resulting in the near demise of bitterns that exclusively nested and foraged there. In 2001, an Environmental Impact Statement for a planned steel mill on the reclaimed land recognized that the bittern was inadequately protected in the region and recommended a compensatory habitat project. Maddock challenged the proposal in his submission to the EIS in 2003 on the grounds that very little was known about the biological requirements, the time required for success would be longer than 5 years, more likely to be 20 or more and result in the likelihood of extinction of the species in the Hunter in the meantime. Fortunately for the bittern, the steel mill project was abandoned.

Two cases of conservation-oriented actions have resulted in conflict of interest between threatened species. The first case, discussed by Herbert (2007, p. 15), was to the detriment of migratory shorebirds in favor of providing prime Australasian Bittern habitat. The other was changing the pattern of floodgate operations to increase tidal access to a large area of current freshwater regime. This action increased salinity to the detriment of Australasian Bittern reed-bed habitat, although to the benefit of other waterbird habitat (Herbert 2007, p. 43). Furthermore, one reserve was sprayed to combat water hyacinth infestation with the serious side effect of killing the reed beds, thus depriving bitterns of important foraging and nesting habitat (a scenario likely to be regularly repeated throughout the region because of recurring hyacinth invasions and increasing infestations of alligator weed). Destruction or degradation of wetlands sites with reed bed habitat in the Hunter Estuary would be ecologically irresponsible and contribute to the ultimate local extinction of the species.

Recent governmental decisions regarding its listing status have been positive for the Australasian Bittern. In Victoria, it had been declared Endan-

gered but South Australia has maintained its Vulnerable status and Western Australia considered it as rare. It was eventually declared an Endangered Species in NSW in October 2010, updating it from its former status of Vulnerable. In February 2011, the Australian Federal Government declared it nationally Endangered and the minister responsible declared that there should be a recovery plan involving a wide variety of land managers and other stake holders across state boundaries.

The seriousness of the current situation is revealed by a current review of the Action Plan for Australian Birds, which proposed upgrading the Australian Bittern plan to achieve compatibility with its new status as Endangered. It confirms the seriousness of the wide distribution of the decline across the continent and the fragility of the species viability (Stephen Garnett, Review Coordinator, pers. comm.). It found that in recent decades the numbers in Murray-Darling Basin strongholds have declined. The Western Australian sub-population has been more restricted and there have been no confirmed records from the Swan Coastal Plain since 1992 and surveys in 2007 and 2008 revealed that half the wetlands supporting the species in 1980 retained any suitable habitat. South Australian breeding is confined to the Adelaide-Victorian border coast. There have been few Queensland records. The species is threatened by diversion of water for irrigation, drainage of permanent and ephemeral swamps for agriculture or urban development, reduced inflows, salinization, overgrazing by stock and inappropriate fire regimes. The review also indicated that there were probably none in New Caledonia and that there had been declines in recent years, up to 2004, in New Zealand.

The upgrade of the conservation status and the review are important and welcome steps, but will mean little unless early and real productive actions are taken to ensure the survival and recov-

ery of the species. However, the complexities involved will make recovery difficult (Maddock 2009b).

Cattle Egret. Two studies of the Cattle Egret, the Lockyer Valley Cattle Egret study and the Project Egret Watch study of the two Lower Hunter colonies, Seaham and Shortland, provide considerable information on its changing status. There is a substantial degree of overlap in the two studies. Nesting began in the Lockyer Valley in 1974/75; McKilligan (2001) covered the continuous 20 year period from 1979-1998. The data for Project Egret Watch's study of the colonies started when nesting first began in the region in the 1978/79 season with partially fragmented observations from then on to 1994/95, providing sufficient data to identify trends. From 1995/96 onwards, a continuous record of annual nest counts has been maintained by Project Egret Watch. Maddock (2008) reported the nest count trend from the peak maximum of 1,950 nests for the combined two colonies at the end of the growth period in 1988/89 to 382 in 2007/08. From then on, the decline still continued to reach a final figure of 158 nests in 2010/11. The Seaham colony had only 25 nests in 2007/08, followed by zero for each of the 3 following years, 2008/09-10-11.

By 2001, the rate of pushing ecologically unsustainable development projects in the Hunter estuary rapidly became much worse. Critically important wetland sites in the Lower Hunter were threatened with disastrous degradation and the important catchment management roles of remnant woodlands in the region were being sacrificed for coal mines, urban and industrial development, resulting in consequent threats to the survival of numerous already declining, threatened species. Very short deadlines for public input on the projects were resulting in frantic searches for data sets and critical reports that were being consistently ignored by the develop-

ment proponents. The relatively strong protective conservation legislation that evolved in the 1980's was being steadily watered down and removed under such strategies as "State Significant Projects", which avoided obligations, even those under international treaties such as the Ramsar Convention.

Although Maddock continued to maintain his schedule of species and habitat monitoring, he became involved in supporting the community environmental groups by providing information and data and being a joint author on specific issues, while also authoring several major submissions on his own. Maddock (2008b) included a number of sections dealing with outcomes from these issues. In 2009, he returned attention to updating data collation and analyses of the monitoring program, focusing on reviewing the mass of unpublished and published material available from Project Egret Watch and other relevant sources. Reports on the progress and issues of the research were published during the period in the *Hunter Wetlands Trust Newsletter* 1985-1991 and its successor, *The Wetlander* (produced by the Shortland Wetlands Centre, now called the Hunter Wetlands Centre Australia). By 1994, over 30 publications in the scientific literature had been produced by the Project and cooperative associates. Because of the disruption caused by the events since 2000, special reports have overshadowed attempts to produce formal, peer-reviewed publications.

The current comprehensive review of available sources has revealed a number of situations that affect the colonies that may not be obvious from monitoring data alone. For example, unpredictable severe thunderstorms destroyed nests. During severe drought, Intermediate Egret chicks ready for fledging were found with collapsed legs. Also during drought, there were seasonally progressive relocations of nest sites within the colonies. Furthermore, we found from marking

studies that rainfall patterns affected the migration movements of egrets. Further analysis is needed on available data to study the effects of rainfall patterns from the 1970's to the present as well other data on Eastern Great, Intermediate, Little and Cattle egrets. As a first step, before attempting formal publication of overall results, a series of work in progress documents based on the reviews are being prepared. The first (Maddock 2011), which has the major tables, graphs and explanatory notes, now is complete enough to make it available for circulation to interested researchers in Australia and elsewhere on request. A second document is in process on the decline of Great, Intermediate and Little egrets. Others are planned for night roosting and use of favored foraging areas by Cattle Egrets migrating through the Hunter Region from northern NSW and southern Queensland nesting colonies during winter; results to date of a study on whether the Hunter Cattle Egret declines are being reflected in winter migrating Cattle Egret numbers in NSW, Victoria, Tasmania and New Zealand; and the rise and fall of Rufous Night Heron numbers in the Hunter.

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The McKilligan (2001) 20-year study of Cattle Egret Population Dynamics has emerged as a possible model for re-analyzing the data on the declining Cattle Egret nesting population and the associated rainfall pattern in the Hunter to determine whether density-dependent and density-independent factors could have been at work to regulate or control the Hunter nesting population.

Murray-Darling Basin. The Murray-Darling system is a vastly complex system of three major rivers fed by a maze of tributary rivers and small streams, lagoons, cutoff meander channels (known in Australia as billabongs), lakes and their floodplains, covering an area of 1,006,000 Km². The river system is born in wide areas of the states of Queensland, NSW, Victoria, South Australia and the Australian Capital Territory. The Murray River gathers input from the two major Murrumbidgee and Darling tributaries as it traverses along the border of NSW and Victoria and eventually enters the Southern Ocean at the mouth of the Murray River in eastern South Australia. Traditionally, the system has provided major support of nesting and year round activities of the four species of egrets, three of bitterns and three other herons, as well as three species of ibis, two of spoonbills, four of cormorants, the Darter (*Anhinga novaehollandiae*), Black Swan (*Cygnus atratus*), Magpie Goose (*Anseranas semipalmata*) and many species of duck. Sixteen internationally important wetlands play a key role in sustaining water bird biodiversity.

The system also supports a population of three million people and a \$9 billion agricultural industry. There has been a history of conflict on land and water use, not only broadly between conservationists and economic growth vested interests, but between state governments and vested local interest groups, including local divisions of irri-

gators and grazers, throughout the complex of thousands of kilometers from the headwaters to the sea. It is possible in the present paper only to give some indication of how complex the issues are.

The natural characteristics of the original system, before the invasion by Europeans, have been systematically changed to supply water to a network of cities, towns, villages and agricultural and other rural pursuits. The release of numerous scientific reports to local, state and federal governments over many years, have repeatedly warned against extending system regulations to create more artificial climatic scenarios by construction of weirs, dams and water diversions, but money and economic growth objectives have almost always prevailed. Progressively unsustainable allocations of water have continued beyond the capacity of the natural processes to replenish. Ultimately the long drought period from 2000 onwards increased the intensity of conflicts between social and ecological problems and the various levels of governments.

Apart from the legal pressures causing crumbling of the ecological sustainability of the system, illegal pressures have emerged as well. For example, in mid-2007, the owner of land in the Gwydir area, which had high conservation value as colonial water bird nesting habitat, destroyed the complete breeding habitat of Intermediate and Cattle egrets and was convicted for the crime. Also, significant water that had been regularly flowing into the Macquarie Marshes, a Ramsar site supporting nesting of 14 species of colonial water birds, was found to have been illegally diverted away for agricultural purposes.

Some idea of the historic ecological value of the Macquarie Marshes nesting sites for herons and other colonial water birds can be gained from the total of 16,600 nests reported in a Macquarie Marshes Advisory and Audit Committee report

(Anonymous 1996-97, p. 17-18):

Straw-necked Ibis 5,000, White Ibis 800, Glossy Ibis 5,000, Intermediate Egret 5,000, Eastern Great Egret 160, Little Egret 110, Cattle Egret 25, Rufous Night Heron 300, Little Black Cormorant (*Phalacrocorax sulcirostris*) 130, Pied Cormorant (*Phalacrocorax varius*) 80, Yellow-billed Spoonbill (*Platalea flavipes*) 6, Darter 1.

Maddock (1996) reported that water issues and colonial water birds were provoking conflict between proponents of environmental sustainability and economic growth in the Gwydir River area of the Murray–Darling system. Before the Copeton Dam was built, the Gingham Channel Wetlands on the Gwydir, a tributary that feeds through the Barwon River into the Darling, supported substantial nesting colonies. Removal of water from the system for cotton growing disrupted the natural flood cycle and after 1984, there were no significant nesting events. In November–December 1995, consistent rains produced the best floods for years. In December, Straw-necked Ibis began nesting, but the process was stalled when water levels began to drop. A violent wind storm resulted in damage to trees and a large number of birds were killed by hail. The area water management authority turned more water into the Gwydir and the decline was reversed. By February, the breeding colony covered a 3 km stretch of wetlands with vast numbers of ibis, 4,000 pairs of Intermediate, 500 Eastern Great and 250 Little egrets. There was controversy between the irrigation lobby, governments and conservations. The irrigation lobby, on one hand, regarded water passing their properties and not being used to earn money as wasted, and wanted to restrict allocation to irrigation. The State Government and conservationists, on the other hand, wanted sufficient environmental flow of water to ensure success for the breeding season.

By 2005, policies to provide environmental flows

to benefit the ecology of river systems had been adopted by most water authorities, but their application, when needed, was not a certainty. In March and April 2004, Maddock was able to assess wetland conditions and species along the length of the Murray River, bordering NSW and Victoria, from Albury to the South Australian border and then to lower reaches to where it flowed into the Southern Ocean. He saw only one Great Egret, no Intermediate or Little Egret nor White-necked Herons. Flood plain wetlands away from the main river course were dry and the countryside was depressingly parched. The southeastern end of the very long (more than 100 km) and narrow Coorong Freshwater Ramsar site was completely dry. This area is part of the Coorong National Park, extending southeastward from near the Murray River mouth behind the dunes of the Southern Ocean shoreline towards the Victorian state boundary. The river mouth end retained some water but very few waterbirds. A few small groups of Australian Shelducks (*Tadorna tadornoides*) and Pied Oystercatchers (*Haematopus longirostris*) loafed on the inland shore, as well as a single Black-fronted Dotterel (*Elsayornis melanops*), but no migratory shorebirds were observed. Information provided by Martin O'Brien (pers. comm.) of what is now called Department of Sustainability, Environment, Water, Population and Communities revealed that drought conditions continued to impact and a lack of meaningful environmental flows to the Murray had resulted in poor to bad breeding opportunities for threatened egrets and poor prognosis for continuation.

Environmentalists and wetland scientists realized that solving the crisis on environmental flows to restore the health of rivers and wetlands was critical to survival of heron species. The Greens Member of the NSW Upper House of Parliament was very critical of the NSW efforts at water reform and was on record as stating that allocating perpetual water licenses to irrigators would en-

trench inadequate environmental water provisions for most of the State's rivers and make the cost of returning the health of the rivers unaffordable.

The complexity of the issues involved in the interaction of natural cycles, water regulation and water bird breeding, were not understood within senior ranks of the relevant department in the bureaucracy. This was illustrated when its Deputy Director commented on an Australian Broadcasting Corporation (ABC) rural program about the dying Ramsar sites in northern NSW, saying that "wetlands have a lack of water due to the natural cycle of drought and will be replenished when it rains". This view was regarded with great concern as it was well established that lack of water was exacerbated by continuing artificial retention by the dams and diversion away from the breeding habitat.

A 2004 Murray-Darling Basin Commission report showed that water requirements of irrigated land had increased by almost 29% and total area of irrigated land by 36%. In 2005, the South Australian Conservation Council Campaigner described the sheer magnitude of this expansion as alarming, emphasizing an urgent need to reduce the amount of water being extracted. Maddock described the Murray-Darling System as "ecologically bankrupt because we continue destroying the ecological capital in an irresponsible splurge of insolvency trading, a crime which would be prosecuted under the laws of financial trading."

Extremely severe drought conditions in the system intensified during the early 2000's and in 2006, they were described as a one in 1,000 event. The rainfall in years 2006/07 were the lowest on record. There was no water bird nesting and grazing and irrigation enterprises were in dire straits under desperate financial stress because of stock and crop losses. What little water was left in the former flourishing freshwater

Coorong Ramsar site at the Murray mouth became ultra-saline, resulting in serious declines in the migratory shorebird and other waterbird populations. The two large lakes (Albert and Alexandria) dried up with consequent catastrophic effects on the water birds and agricultural enterprises that depended on them.

On the political front, the coalition conservative Federal Government lost to Labor in 2007. In 2010, the election resulted in a Labor hung parliament, dependent on support from the Greens Party and a number of independents, and facing a belligerent conservative opposition in the lower house. The government also had to face problems raised by a constitutional delay of several months in gaining balance of power in the Senate. Consequently, progress in trying to solve the Murray-Darling catastrophe became even more convoluted and the level of conflict increased.

In 2004, State and Commonwealth Governments set up an initiative for reforms to produce sustainable water balance in the Basin. In 2007, the Australian Parliament passed the *Commonwealth Water Act 2007*, which led to the development of a Basin Plan. The 2007 Labor Government also introduced a buy-back of water rights scheme and began to increase environmental flows in the face of considerable opposition. A highly reputable group of scientists with long-term experience and expertise on wetland issues (the Wentworth Group) put a lot of effort into producing a plan based on sound science, which recommended a cap on diversions of 4,400 GL as essential for restoring the Basin's health.

In the meantime, the Murray-Darling authority was reshuffling in structure and personnel, and the Basin Plan that was ultimately released was well below the 4,400 GL cap. The plan raised a storm of angry community rejection and some public demonstrations burned the plan. Members of the Wentworth Group withdrew from the

process.

Conditions changed rapidly and dramatically from 2006 onwards. In 2008, Queensland received widespread flooding. By 2009, the Murray-Darling system was in flood, moving downstream which continued into 2010-2011. In May 2011, there was rain across the whole basin. Flood waters were flowing into the Southern Ocean from the Murray mouth and the dredging there ceased for the first time in eight years. The Coorong and Lakes Albert and Alexandria filled. Overall favorable conditions for breeding and foraging returned without any immediate threat of failure because of loss of water from being held up by the dams or insufficient rain failing to keep the floods moving for long enough to ensure nesting success.

TV presenter Sarah Clarke (2010) travelled to the Low Bidgee Wetlands on the Murrumbidgee River, interviewing scientists and landholders. In her report, she found at least 20,000 birds were nesting in Low Bidgee Wetlands. The year was a mega breeding event, the best in a decade. Straw-necked and Glossy Ibis, cormorants and Royal Spoonbills were all nesting and some chicks had already taken flight. Kate Brandis (pers. comm.) reported lots of breeding events across the basin and if they were as successful as this one looked to be, there would be a good boost in the overall population. Sharon Ryall (pers. comm.), who was navigating the waterways to count eggs, recorded herons and other fish eating birds, including nesting Rufous Night Herons. Pied Cormorants, normally tree nesters, were nesting below White Ibis, an unusual situation. Some land holders helped the breeding event by giving up some of their water allocation and micro-managing the water for the best outcomes, diverting flows through channels to suite the birds' needs.

However, the floods following years of drought caused community disruption as both livestock

and human lives were lost, and homes, crops, and businesses destroyed.

Conclusions

Assessment of a bleak future for Australian herons still stands, despite nesting success in response to floods and the fact that some rural property owners are becoming proactively supportive of the water birds. Conservationists, including the Heron Specialist Group, need to increase emphasis on the number, and improving the quality of, long-term monitoring projects. Results need to target a much wider audience than academic publications and press to put ecological sustainability ahead of destructive economic growth. In Australia, the major political parties, and a wide range of the general public, are addicted to pursuit of economic growth and do not understand ecological sustainability principles. They fail to accept that we are animals, subject to laws of nature. Unless that culture can be changed soon, the best of Heron Specialist science will not prevent their plunge to extinction.

The present signs are not encouraging. The opposition leader demonstrated his lack of knowledge of ecological systems by proposing that the Queensland rivers be dammed to control future flooding. A parliamentary committee is proposing a compromise to avoid restricting water for irrigation by using water saving strategies. There is a risk that the success of the current flood episode will cause unwarranted complacency. There is still a lack of recognition that the previous woes were the direct outcome of consistently ignored warnings against using water at a greater rate than the total system can sustain.

The situation is still volatile. As this report was being compiled a new research study was released to the media by highly regarded wetland scientist and Murray-Darling specialist Richard

Kingsford. The critical finding was that the flooding coverage from the recent wet periods has been much lower than had been previously estimated.

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