Monitoring Wetland Birds

A User's Guide

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Introduction

In the Wimmera and southern Mallee regions of Victoria, wetlands are a crucial component of the natural environment. Whether they be a chain of lakes or swamps along an ancient shoreline, rivers and streams flowing north to terminal lakes, or short duration, rain-filled depressions, wetlands have helped define this region and strongly influenced the biodiversity of the landscape.

Wetlands were a vital resource for Aboriginal people living in this region for thousands of years, and were similarly a vital resource for European settlers. The unreliability of the natural wetland systems provoked settlers to modify the wetlands to suit their purpose which, over time, had a major impact on the natural systems, and consequently on the biodiversity around them.

Wetland Types

Wetlands come in all different shapes, sizes, hydrological regimes and vegetation types. An ocean beach or mangrove swamp is technically a wetland, though not directly relevant to the Wimmera or southern Mallee. Wetlands can range from large lakes to small soaks, saline water or fresh, permanent or ephemeral, deep or shallow, vegetated or bare.

Crow Swamp - A deep water wetland with open water and algae present.

Mutton Swamp - A shallow wetland with emergent rushes and no open water.

One of the main factors which determines wetland type is hydrology, or the water source of a wetland. Lakes are generally fed by rivers or streams. Lake Hindmarsh is the largest freshwater lake in Victoria and the first terminus of the Wimmera River, the longest watercourse in the region flowing from a catchment starting in the Grampians and Pyrenees. Small lakes or swamps can be filled via small creeks, generally by rainfall, surface runoff or springs.

A small, rain-filled shallow wetland in a Red Gum woodland.

Artificial wetlands, such as dams can be fed by natural runoff, but in the Wimmera Mallee were mostly channel fed. Since the completion of the Wimmera Mallee Pipeline, the only way dams previously filled by the channel system can receive water is if they either have their own natural catchment, or they are filled via the pipeline.

A Little History…

European settlers took up land around natural watercourses, lakes and swamps. The natural environment defined where settlers lived and worked, and settlers were at the mercy of an unreliable and poorly understood wetland system. Over time, things changed and European settlement started to define the wetland systems. Land clearing for agriculture, draining of swamps,

the damming and diversion of waterways and the construction of the Wimmera Mallee channel/dam system all had a massive impact on wetland systems. The culmination of settlement modifications has been the construction of the Northern Mallee Pipeline and Wimmera Mallee Pipeline.

A channel-fed dam near Birchip, in the southern Mallee, in 2005.

Changes in land use and modifications such as roads and channels have affected the way these wetlands fill through altering flow paths and runoff volumes. Environmental water helps to boost water volumes in a number of wetlands across the northern Wimmera and southern Mallee, particularly during dry conditions.

Wetland Birds

Wetland birds can be loosely defined as birds which are completely dependent on wetlands all the time. These include species such as ducks, herons, grebes, crakes, ibis, brolgas, cormorants, shorebirds, terns etc. The *Glovebox Guide to Wimmera Wetland Birds* gives good examples of the many different species of waterbirds found in the Wimmera.

For birds to occur at any location, they need two basic things – food and shelter. Most wetland birds seek their food in or around water. Though just to contradict this, some species, such as ibis, will forage in dry paddocks. What waterbirds eat and how they obtain food helps us to understand where and when different wetland bird species are likely to occur. For example, cormorants eat fish and dive to catch them. Therefore, cormorants will only occur around wetlands that support fish and are of sufficient depth to allow cormorants to dive after them.

A Little Black Cormorant roosting on a low branch at Crow Swamp.

Another example are herons. These are long-legged, long-necked birds which generally wade through shallow water or wet vegetation, stabbing prey with their pointed bills. This strategy does not work for a crake, which has short legs and a short bill. They stalk invertebrates through thick vegetation. The vegetation is their shelter, so a bare wetland does not provide suitable habitat for crakes.

Ducks, swans, pelicans and grebes float on water, diving or reaching down for aquatic vegetation, fish, or sometimes invertebrates. Open water is an important feature for these species, even though it doesn't necessarily need to be a large area.

A raft of Australian Pelicans and a Silver Gull at Lake Hindmarsh.

There are dozens of species of shorebirds, many just variations of grey and brown and all looking the same to the untrained eye. But shorebirds also include Masked Lapwing (Spur-winged Plover) and Black-winged Stilt which are quite distinctive and easy to identify. Shorebirds, as their name suggests, frequent the edge of wetlands. Some probe for food in soft mud, others search for food visually, picking prey off the surface. Shorebirds generally prefer bare wetland edges.

Black-winged Stilt foraging along the bare edge of a wetland (Schultz-Koschitzke).

The exception to this are snipe, which probe into soft mud among thick vegetation. The nature of the edge of a wetland will determine whether shorebirds can occur there.

Monitoring Wetlands

Whilst environmental water will keep permanent water in a number of locations, most wetlands in the Wimmera and southern Mallee regions are sometimes wet and sometimes dry. This is an entirely natural process and the biodiversity of wetlands has adapted to cope. Birds can fly away somewhere else. Frogs will hide in moist cavities or burrow underground and sit out dry spells. Most aquatic insects have an adult, flying stage, so like birds, they fly off elsewhere. When a wetland dries out, yabbies burrow, freshwater shrimp produce dormant eggs known as cysts, algae form spores. But all these are just different types of bird food, and one of the most effective ways of monitoring the health of a wetland is to monitor the use of a wetland by birds.

There are a couple of different methods of monitoring wetland birds. At its simplest, a list of the different bird species present at a wetland can be recorded. This is called presence – absence sampling.

Presence – Absence Sampling

Recording a list of the different bird species present at a wetland will identify the range of resources available at that wetland. As described above, different bird species have different foraging and shelter requirements, so the presence of fish-eating birds indicates that fish are present, the presence of algae feeders indicates the presence of aquatic plants etc. The absence of these species is also an indication that certain wetland resources are not present at the sampled wetland.

Presence – absence sampling can be opportunistic, i.e. conducted only when the wetland is full of water, or when the observer happened to be in the area. There is little point surveying the wetland when it's dry. Presence – absence sampling can also be conducted more rigorously, such as once season or every month. An advantage of regular sampling is that it allows trends of species' use of a wetland to be measured. How frequent or how long a species is present, seasonal use, presence during different phases of a wetland hydrology cycle, such as drying or filling, etc. This information can provide a more detailed picture of the health of a wetland and its importance to birds.

Counting Wetland Birds

A more involved method of monitoring birds at a wetland is to count the number of individuals of each species present – a measure of bird abundance. Counting species will provide the same information as presence – absence sampling but also measures resource availability and the capacity of a wetland. What this means is that a wetland supporting only one or two Australian Wood Ducks is most likely to have far lower levels of food availability than a similar wetland supporting 50 ducks. The abundance of a species at a wetland is important if an understanding of resource availability is desired, or the understanding the value of a wetland as a drought refuge, migration stop-over or breeding site. Counting birds is harder, however, and the bigger the wetland the harder birds are to count.

Wetland Bird Identification

The best way to identify the different species of birds at a wetland is with a pair of binoculars. For large wetlands, a spotting scope is ideal, but not everyone has one. A bird identification guide is also essential. There are many bird field guides available from bookshops, and the Wimmera CMA *Glovebox Guide to Wimmera Wetland Birds* is a very useful guide to have around.

Size, shape, colour and behaviour are all useful features to examine when trying to identify wetland birds. Birds can be identified into broad categories by size and shape. For example, herons and egrets are long-legged and long necked, with pointy bills. Ibis are also long-legged and long necked, but not as long nor upright as herons and egrets; they are stocky and lave long, down-curved bills. Duck are short-necked, have short bills and short legs. Cormorants also have short legs and short bills, but have longish necks.

Mixed species flock on the edge of a drying wetland.

Colour can help an observer differentiate between species within these broad categories. For example, egrets are white, herons are grey (or dark grey with a white neck). Of the three species of ibis in Australia, one is all white with a bald black head (Australian White Ibis), one is black and white (Straw-necked Ibis), the other smaller and bronze-brown (Glossy Ibis). Cormorants can be either all black or black and white, with big and little versions of each. Ducks start to get tricky. Australian Wood Ducks are small, grey, brown and white. Teal are also small and either all grey-brown or dark

brown to chestnut with a dark glossy head (depending on whether female or male). From here on it is best to consult your bird guide for size and colour differences between each species.

Behaviour can help identify birds within broad categories. Grebes swim on the surface and will dive to avoid threats. Ducks usually fly off with little provocation. As mentioned earlier, cormorants swim and dive to forage, and will perch on logs, rocks or branches to dry their wings or to roost. Shorebirds will run along the shore, flying to another part of the wetland or away if threatened. A bird guide will help with identifying species within these categories.

Recording Observations

A generic wetland bird monitoring data sheet has been prepared with contains various fields in which to record information about the wetland being monitored and the bird species present. Basic information worth collecting are the name and location of the wetland, date, time and observer name. Information describing the wetland and its condition can also be collected. This will help put into perspective the bird survey data. Wetland data can include how much water is present (e.g. <25% full, 25—50%, 50—75% or >75% full). The extent of bare and vegetated edge can be estimated as a percentage, presence of any algae in the water, presence of aquatic animals (yabbies, tadpoles etc.) plus whether the water is fresh, brackish or salty (a simple taste test?).

The rest of the form is dedicated to listing the bird species present. Birds can be counted, if such detail is desired, and any relevant notes, such as breeding, roosting etc. At the end of the form is space for any other relevant information to the wetland and anything which might influence the bird species present.

The form can be modified to suit the needs of any particular group, such as a Landcare group or Catchment Management Authority. Additional fields can easily be added.

Analysing The Results

The analysis of any wetland bird monitoring data collected will depend on what the results are to be used for and how they were collected. At a basic level, lists of birds present at a wetland can be produced. If multiple surveys were conducted, then the frequency of occurrence of a particular species can be calculated (how many times the species was present, divided by the number of surveys conducted). If wetland condition data were collected, these could also be summarised and compared with the bird survey results.

If birds were also counted, numbers could be averaged and compared against wetland condition etc. Much of any data analysis depends greatly on what questions one wants answered, and these questions are best determined before surveys begin. In this way, the correct data will be collected and an appropriate analysis undertaken to provide the answers needed.

WETLAND BIRD MONITORING FORM

Wetland Name:		Wetland Location:
Date:	Start time:	Observer:

Water Level (tick):	<25%	25—50%	50—75%	>75%
Water condition (tick):	Fresh	Brackish	Salty	

Percentage of bare shoreline:	Percentage of vegetated shoreline:

Algae present (circle):	Y	N		
Aquatic animals present (tick)?	yabbies	turtles	tadpoles	other: ……

Wetland Bird Species:

Name	Present (tick)	Count	Notes

Additional notes: