Predicted ecological outcomes of a late summer watering at Hird Swamp, February 2015

Damien Cook, Rakali Ecological Consulting
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Hird Swamp at Macorna North is an internationally significant, Ramsar-listed wetland. It is currently in an advanced stage of draw down, with an average depth of approximately 50mm over less than 5% of the wetland area. In this condition the wetland is providing excellent foraging habitat for small wading birds including Marsh Sandpiper, Sharp-tailed Sandpiper and Black-winged Stilt (see the final section of this report for a list of fauna observed at Hird Swamp on 21st January 2015.)

The swamp has held water since 30 September 2013, having been artificially filled with environmental water allocations throughout spring and summer. The most recent top up flows occurred in October 2014. On the 1st of February 2015 the aquatic plant species which dominated the wetland during its wet phase, including Red Water-milfoil (Myriophyllum verrucossum), Eel Grass (Vallisneria americana), Robust Milfoil (Myriophyllum pappilosum) and Clovestrip (Ludwigia pepiloides) had mostly died back to rootstock or seed banks and dry-phase species including Pale Knotweed (Persicaria lapathifolia) and Clammy Goosefoot (Dysphania pumilio) had germinated across much of the wetland floor.

The Victorian Field and Game Association have proposed that Hird Swamp be filled with water again prior to the commencement of the 2015 duck hunting season and remain inundated until June 2015. This briefing paper discusses the likely ecological responses of plants and animals at Hird Swamp to another inundation phase.

Predicted ecological outcomes of a late summer watering at Hird Swamp in February 2015 are;

1. **Increase in the cover of Cumbungi and Common Reed, which will alter fauna habitat structure**

During the recent wet phase there has been extensive germination of Cumbungi (*Typha orientalis*) across the deeper areas of Hird Swamp. As of the 1st of February most of these seedlings were greater than 50 cm tall (see Figure 1). If the swamp is inundated now these seedlings are likely to reach adult height by the end of their growing season (approximately the end of April) and will develop well established rhizomes (underground stems which also function as a organs from which plants can regenerate following a dry period). However, if the swamp is allowed to dry these plants may fail to develop rhizomes and therefore may not regenerate the next time the swamp is inundated.

The NCCMA has expressed concern that Cumbungi (*Typha* species) and Common Reed (*Phragmites australis*) are spreading at Hird Swamp and have a goal of keeping these species below a cover threshold of 40% (H. Kleinert pers. comm.). Detailed mapping of these species at Hird Swamp in February 2014 showed that at that time their combined cover was 138 hectares, which is 37% of the total wetland area (Cook et al 2014). If the Cumbungi seedlings currently present in the swamp survive to reach adult size the combined cover of Cumbungi and Common Reed is likely to exceed 40%. Note that under the Ramsar convention listed
wetlands are supposed to be managed so as to maintain their ecological character, including vegetation structure (KBR 2011).

![Figure 1. The picture on the left was taken in April 2014. The picture on the right was taken in February 2015 and shows young Typha plants that were not present the previous year circled in red.](image)

2. **Death of regenerating River Red gums caused by depletion of soil oxygen**

River Red Gum roots require oxygen and prolonged flooding or water-logging can cause the death of trees through depletion of soil oxygen (Roberts and Marsden 2000). All of the original River Red Gums in the deeper parts of Hird Swamp were killed by prolonged flooding during the 20th century. All live trees within the deeper parts of the swamp have regenerated from seed over the past 10 years. These trees have either been inundated or water-logged for the past 17 months. If inundated again now they are likely to remain deprived of oxygen for at least a further 6 to 8 months, putting them at a high risk of drowning (even if the wetland is rapidly emptied at the end of June the wetland substrate will remain water-logged through the rest of winter due to low evaporation rates typical at that time of year). However, if the wetland is not topped now high evaporation rates between now and the middle of autumn will ensure drying of the wetland substrate enough to allow the root zone of these Red Gums to be re-oxygenated.

The dead River Red Gum and Black Box at Hird Swamp are a very important habitat resource. Hollows in these dead trees provide nesting sites for large numbers of ducks and parrots, roosting sites for bats and shelter for the endangered Murray-Darling Carpet Python (*Morelia spilota ssp. metcalfei*). They also provide extensive roosting platforms for Ibis, Spoonbills, Cormorants and Darters and nesting sites for the vulnerable White-bellied Sea Eagle (*Haliaeetus leucogaster*). However, because the trees are dead this resource is steadily being depleted as trees rot at the base and fall over. The risk of fire when the wetland is dry is extreme and an intense fire would cause the catastrophic loss of many of these trees in a very short period of time.
Encouraging the establishment of living River Red Gums throughout Hird Swamp is critical for ensuring wildlife continue to have access to this important resource. Living Red Gums are much more attractive to many species of birds for nesting (Rogers and Ralph, 2011), they continue to produce hollows throughout their long lives, ensuring a constant replacement of this resource and they are much more likely to survive bushfire. Living River Red Gums also provide other important resources for fauna such as nectar and seeds.

Figure 2. Live young River Red Gums in a deep area of Hird Swamp. As of February 2015 these trees had been inundated for 17 months, and would be unlikely to survive another 6 months of soil water-logging.

3. Increased growth and spread of summer-growing aquatic weeds, such as Water Couch (*Paspalum distichum*).

Water Couch is a high threat exotic plant species which spreads most rapidly when moisture is available during the spring, summer and autumn period. Infestations of Water Couch at Hird Swamp have grown significantly over the recent wet phase, and will continue to proliferate if provided with more water now. However, if the swamp is allowed to dry growth of this species will be retarded.

4. Death of trial plantings of the endangered, Flora and Fauna Guarantee-listed Hoary Scurf-pea (*Cullen cinereum*).
A trial planting of fifty endangered, Flora and Fauna Guarantee-listed Hoary Scurf-pea *(Cullen cinereum)* was conducted at Hird Swamp in January 2015. The habitat of this species is the drying bed of recently inundated lakes and wetlands. While the species is adapted to growing on drying mud it is killed by prolonged inundation. The trial was conducted to determine the suitability of Hird Swamp and other Kerang wetlands for the re-introduction of this species, as much of its habitat has been rendered unsuitable by modification because of increased salinity and changed water regimes.

![Figure 3. Hoary Scurf-pea (Cullen cinereum)](image)

5. **Alteration of currently productive habitat for indigenous fauna and flora**

Re-flooding of Hird Swamp will completely alter the habitat that is currently present. The majority of the bird species utilising the swamp now feed by probing in mud or shallow water. Increasing water depth will force these species to leave Hird Swamp to search for suitable habitat elsewhere.

Recent experience at both Hird Swamp and Lake Yando has shown that when a drying wetland is topped up most of the bird diversity and abundance is driven away for a considerable period of time. This phenomena probably occurs because flooding resets the environmental conditions at a wetland, and there is then a significant lag time for food resources such as plants or invertebrates to build back up, as they have to adjust to the new conditions.

**References**


Fauna observed at Hird Swamp, 21st January 2015

Numbers of birds using wetland habitat were counted

Brolga 2
Marsh Sandpiper 40
Sharp-tailed Sandpiper 200
Common Greenshank 2
Black-winged Stilt 400
Masked Lapwing 10
Yellow-billed Spoonbill 20
Royal Spoonbill 5
White-faced Heron 10
Eastern Great Egret 7
Australian White Ibis 3
Straw-necked Ibis 56
Glossy Ibis 5
Black Swan 2
Grey Teal 2000
Australasian Shoveler 30
Purple Swamphen 18
Dusky Moorhen 1
Black-tailed Native Hen 30
Australian Pelican 12
Whistling Kite 4
Red-kneed Dotterel 2
Black-fronted Dotterel 12
Welcome Swallow 3000
Tree Martin 60
White-fronted Chat 44
Brown Quail 30

Superb Fairy-wren
White-winged Wren
Mudlark
White-breasted Woodswallow
White-plumed Honeyeater
Red-rumped Parrot
Eastern Rosella
Willie Wagtail
Australian Magpie
Brown Treecreeper

European starling
House Sparrow

Ragged Snake-eyed Skink
Tiger Snake
Eastern Brown Snake
Spotted Marsh Frog

Swamp Wallaby