

Study to Determine Water Requirements for McKerrows Marsh - Great Forester River



Values, Threats and Proposed Management Objectives

Water Assessment and Planning Branch
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Cover Photo: Fringing aquatic wetland at McKerrows marsh

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1. Introduction

McKerrows Marsh is a riparian wetland of about 386 hectares located immediately above the limit of tidal influence on the Great Forester River (Figure 1). The marsh contains about 200 hectares of blackwood-paperbark forest, which fills all the western arm of the marsh and is the largest remaining patch of this vegetation community type in northeast Tasmania. This particular forest has been identified as ‘regionally significant’ in terms of forest conservation (Pannell, 1992) and there are plans to provide protection to this area through the creation of a ‘Nature Reserve’.

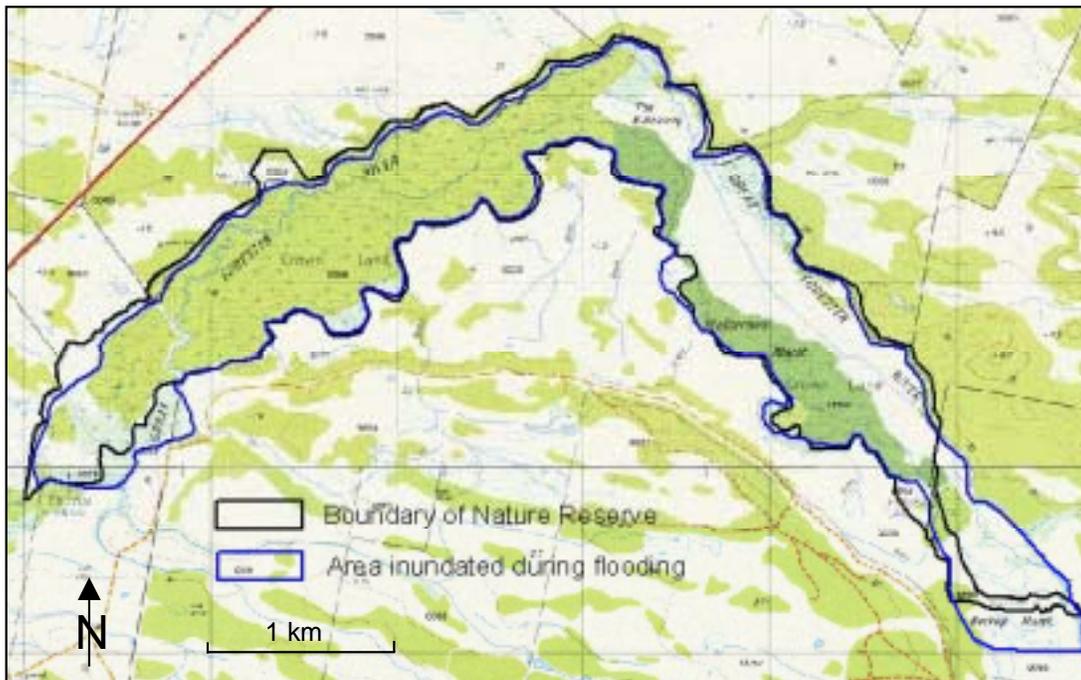


Figure 1: Map showing the boundary of the proposed Nature Reserve at McKerrows Marsh, and the probable area of inundation during larger floods in the Great Forester River.

In July 2003 a Water Management Plan (WMP) for the Great Forester catchment was completed. The Plan contains a ‘Managed Minimum Flow’, which maintains summer baseflows and hence provides some protection for instream biota within the Great Forester River when the flow regime is most affected by water extraction.

During the development of the WMP it was recognised that there was limited knowledge of the ecosystem within McKerrows Marsh, specifically in relation to its water needs, and the DPIWE made a commitment to undertake studies to examine this. Evidence from the Australian literature (Environment Australia, 2001) is that the most important facets of the flow regime that sustain wetland ecosystems are the

frequency of floods and the duration of inundation. As the impact of water extraction is mostly on summer base flows, it is unlikely that current water usage in the Great Forester catchment upstream of McKerrows Marsh is having any significant impact on the long-term health of the wetland. The study by DPIWE is therefore focussed on the needs of the wetland in relation to high flow events and the role of groundwater in the local water regime.

The McKerrows Marsh Study commenced in October 2004 with desktop work to collate existing information on the hydrology and hydro-geology of the area (DPIWE, 2005a) and to identify what was known about the blackwood swamp forest community. This was then followed by field-based data gathering to gain a better understanding of the flora and fauna presently inhabiting the area (DPIWE, 2005b), and the installation of groundwater monitoring to examine linkages between surface water and groundwater within the marsh. While this information will ultimately be used to develop a water regime for the marsh, in the first instance it will be used (along with other information) to identify existing uses, values and threats. The purpose of this document is to detail these and propose a list of management objectives that will provide guidance in the development of an appropriate water management regime for the wetland.

2. Current Uses

Water extraction: Surface water is drawn from the river channel within the marsh at three locations to supply irrigation water for properties forming the northern and southern boundary of McKerrows Marsh. This water is generally drawn between the months of October and April, but depends largely on local rainfall patterns. While the two upstream water extractions are regulated under the WMP and have a set allocation of water, the river at the location of the lower extraction point experiences some tidal influence, and because of this water extraction at this location is not regulated under the Plan.

Stock access: Both the northern and southern sides of the western arm of the marsh have been fenced to prevent access by livestock. This has provided good protection from damage due to grazing within the blackwood-paperbark swamp forest. However, large parts of the eastern arm are still subject to at least intermittent grazing by cattle and sheep. Heaviest grazing occurs in the southwestern area within the grassy sedgeland and black gum forest communities.

Recreational uses: Although the river downstream from McKerrows Marsh is amenable to recreational fishing for trout, the enclosed nature of the riparian zone within the marsh does not provide either good habitat for trout, nor is it easy to gain access for fishing. Despite this, some locals do fish for blackfish within the marsh, and whitebait are taken from the river during the limited open season that occurs in October during the spring run. During this time groups of people have been seen camped on southern side of the river, as whitebait are often best caught at night.

Some hunting for wallaby also occurs around the boundary of the marsh, and parties of up to 5 people have been seen using dogs to hunt within the western arm of the marsh.

Habitat for native animals: Because the marsh provides good habitat and is relatively undisturbed on a day-to-day basis, the area is used by numerous species of native terrestrial and avian fauna. Notable species that have been seen within the marsh include wombats, wallabies, forester kangaroo, permanent and seasonal waterfowl, platypus, possums, black cockatoos, numerous small insectivorous and nectar eating birds, owls and birds of prey.

3. Existing Values

1. The blackwood-paperbark forest community has been identified as a remnant forest community in northeast Tasmania, and as a result should be viewed as having a high priority for forest conservation at the regional level. Although it has not been awarded 'reserve' status under any formal forest management system (such as the Regional Forest Agreement), the significance of this patch has been recognised and will be considered in the near future under the Crown Land Assessment Program.
2. The mosaic of vegetation communities found within the McKerrows Marsh has some importance in terms of regional biodiversity. As well as containing the remnant blackwood-paperbark swamp forest community, the marsh also contains a number of rare or threatened species of plants.
3. While many of the species of frogs and burrowing crayfish that occur within McKerrows Marsh are also likely to be found in areas outside of the wetland, the wetland does provide an ideal habitat where there is little disturbance and minimal risk from human-induced threats such as exposure to bio-hazardous chemicals.

4. The aquatic environment within the marsh provides valuable habitat for a host of native fish species, a number of which are less abundant or do not occur further upstream in the Great Forester River. This is particularly important for the pygmy perch (*Nannoperca australis*) and the common jollytail (*Galaxias maculatus*) and the spotted galaxias (*G. truttaceus*). The endangered giant freshwater lobster (*Astacopsis gouldi*) has also been found in the marsh.
5. During public consultation as part of the environmental flows assessment for the Great Forester River (McKenny & Read, 1999), fishing for blackfish and whitebait were both highlighted as cherished recreational values for the lower river system by the local community. Significant value was also placed on providing water to sustain aquatic life within the river system, and managing the river to maintain and improve riparian zones.
6. Being located at the bottom of the Great Forester catchment, the marsh also provides some ecosystem service values associated with the processing and removal of nutrients and other water-borne contaminants prior to discharge into the coastal environment. For example, the anaerobic sediments within wetlands are widely known to reduce nitrogen concentrations in freshwaters through denitrification, reducing the potential pollution of coastal marine environments (Whitmire & Hamilton, 2005).

4. Threats to current condition

Extraction from groundwater: At present, water use appears to have minimal impact on the condition of the marsh, although to some extent this may be due to the proximity of groundwater to the surface. Visual evidence suggests that water extraction from the river channel within the marsh tends to have only minor effects on local water levels and this may be due to the strength of the linkage with groundwater. The main threat is therefore likely to come from future increases in water extraction from groundwater, given that access to surface water during the summer is restricted under the WMP. Any significant decline in groundwater level in and around the wetland is likely to have a potentially large impact on the ecosystem and biodiversity. Lowering of water tables will directly affect local burrowing crayfish populations and the health of the blackwood-paperbark forest community, and indirectly impact on flora and fauna that may rely on this forest community for their survival.

Further drainage activity: Historical timber removal, river straightening and drainage of the riparian floodplain within the eastern arm of McKerrows Marsh has led to a vastly altered environment, which is now dominated by sedges and grasses. It is possible that the drier conditions that have resulted from the installation of drainage channels in this area has led to or contributed in some manner, to the die-back that is widespread in the black gum forest along the southern boundary of this part of the marsh. Any additional alterations to surface water drainage in and around the marsh poses a threat to the long-term health of the ecosystem.

Significant alteration to the flow regime: While the pattern of present water use in the catchment relies largely on extraction from the river during the irrigation season (normally between October and April), future expansion of agricultural production is likely to depend on capturing and storing higher winter flows. Given the previously stated importance of these components of the flow regime in sustaining riparian and wetland vegetation, there is some risk that such developments proceed without an adequate understanding of the water needs of the ecosystem in McKerrows Marsh.

Livestock damage: Although fencing has been installed around most of the western arm of the marsh, some level of grazing still occurs within the eastern arm, where conditions are drier and there is more food for stock. While this may have less of an impact on the condition of the grassy sedgeland community, continued access to the eastern arm will clearly continue to impact negatively on the smaller patches of blackwood-paperbark forest, teatree scrub and aquatic wetlands that persist in this area. Stock access to the black gum forest will also prevent recruitment of young plants to this community and lead to the eventual loss of this forest.

Willows: While the presence of willows within the marsh is not a direct result of present water or river management activities, it does constitute a significant threat to the long-term integrity of the marsh. Its historical use in the Great Forester River to control erosion has meant that this invasive tree now occurs throughout most of the length of the river, particularly where riparian vegetation has been removed or there have been river management interventions. Its potential to spread through vegetative reproduction and its rapid growth enables it to colonise disturbed river banks more quickly than native species such as teatree. This is most likely to be the reason for the significant thicket that exists within the heart of the marsh. Examination of historical streamflow information for the river and areal photographs indicates that following a significant flood in 1988 the river scoured a new path through the marsh, and dumped a deposit of gravel that was quickly covered by willows. Although it is likely that

this thicket is restricted from expanding by the presence of well-established native vegetation all around it, the occurrence of similar events in the future could substantially enlarge this infestation.

5. Proposed Management Objectives

The most important management objective should be to maintain the marsh in its current condition and 'ecological character'. The ecological character of a wetland has been defined as "the structure and inter-relationships between the biological, chemical and physical components of the wetland" (Ramsar website). In the Environment Australia document entitled: 'Environmental Water Requirements to Maintain Wetlands of National and International Importance' (2001), important aspects of ecological character are considered to be essential features of the water regime (such as seasonality, flood frequencies and drying events) and the presence of particular vegetation communities and fauna. While McKerrows Marsh is not a wetland of National or International significance, it is important at a regional level and therefore such an objective is appropriate.

Under this general objective for McKerrows Marsh, there are two proposed specific objectives. These are:

1. To sustain populations of aquatic fauna inhabiting the marsh, including burrowing crayfish, pygmy perch, blackfish, species of galaxias and the giant freshwater lobster.
2. To preserve the existing diversity of vegetation communities within the marsh and the present coverage of blackwood-paperbark swamp forest.

The aim in defining these management objectives is to provide guidance in developing an appropriate water regime for the wetland. This will be done once the relationship between biota and the water regime are understood and described. It should be noted that any water management regime that is developed for the marsh vegetation is also likely to provide for the water requirements of fauna presently inhabiting the area.

6. References

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