DRAFT CONSERVATION ADVICE
Wetlands and inner floodplains of the Macquarie Marshes

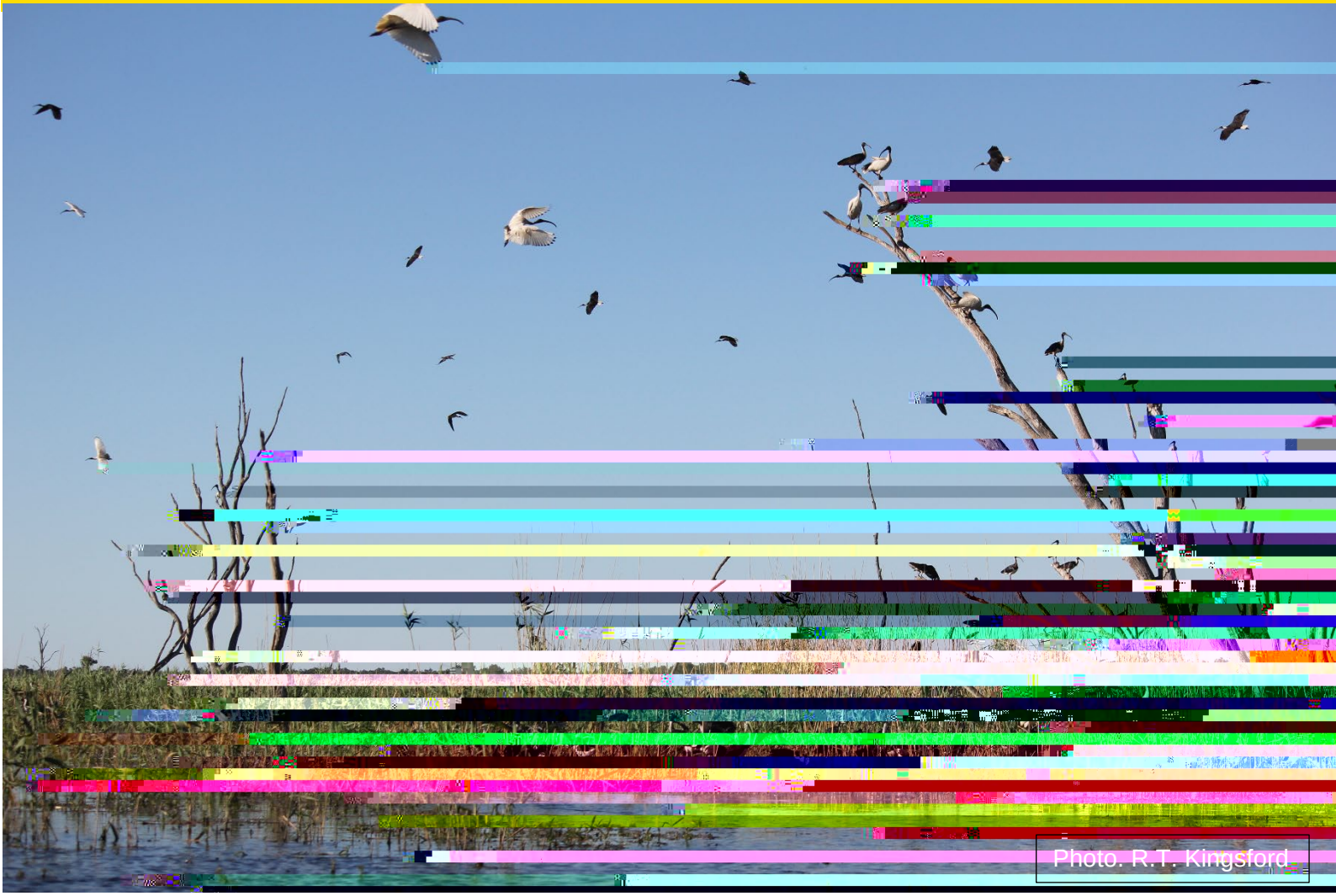


Photo. R.T. Kingsford

Submission Centre for Ecosystem Science, University of New South Wales

October 2024

Table of Contents

Table of Contents 1
Section 1. Ecological community name and description 3
Consultation questions/comments on the area inhabited 3
Consultation questions/comments on the species assemblage 3
Consultation questions/comments on the functionally important flora species 4
Consultation questions/comments on the key ecological processes 5
Section 2. Identifying areas of the ecological community 7
Consultation questions/comments on the key diagnostic characteristics 7
Consultation questions/comments on additional identification information 7
Consultation questions/comments on condition classes, categories and thresholds 8
Consultation questions/comments on habitat critical to the survival 9
Section 3. Cultural significance 10
Consultation questions/comments on cultural significance 10
Section 4. Threats 12
Consultation questions/comments on threats 12
Section 5. Conservation of the ecological community 14
Consultation questions/comments on existing protection and management plans 14
Consultation questions/comments on the buffer zones 14
Consultation questions/comments on priority actions 14
Section 6. Listing assessment 16
Consultation questions/comments on criterion 1 16
Consultation questions/comments on criterion 2 16
Consultation questions/comments on criterion 3 17
Consultation questions/comments on listing assessment (criterion 4) 17
Consultation questions/comments on listing assessment (criterion 5) 18
Consultation questions/comments on listing assessment (criterion 6) 18
Appendix A. Species lists 19
Consultation questions/comments 19
Appendix B - Relationship to other vegetation classification and mapping systems 19
Consultation Questions/comments 19
Appendix C – Detailed description of biology and ecological processes 20
Consultation Questions/comments 20

Section 1. Ecological community name and description

Consultation questions /comments on the area inhabited

a. Do you agree with the proposed name for the ecological community? Please provide an appropriate First Nations name that could be used in addition to, or instead of Macquarie Marshes (noting Wambuul is accepted as one of the First Nations names for the river, but we have not proposed it as part of the ecological community name as it is not likely to be the right First Nations word to use for the Marshes themselves).

Comment as92 re d 1 Tw 10.4 (.h4r-3.8 (ose)-7.5 (d)- (n [(1 Tw 2 10.98 7o.6 (.)]TJ /TT1 o)-5.8t)-2.9 (t)-2.7 (t

b. Please provide information on other functionally important flora and fauna that should be highlighted here and include reference information/sources. Examples might include birds, frogs and fish such as silver perch, golden perch or a group of small-bodied fish.

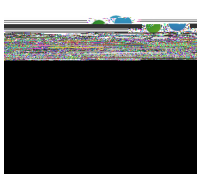
Comment -

Currently, there are only functionally important flora included. There are other important functionally important fauna, particularly the waterbird community, fish community, frog community and reptile community (including turtles and snakes). These are all important and can be measured and monitored. Ideally a table is included to add these groups in, given their importance to the characterisation of the Macquarie Marshes. There is also an important woodland bird community which could also be tracked (see Blackwood 2010).

Consultation questions /comments on the key ecological processes

a. How can the preceding summaries on key ecological processes be improved using latest data and published studies?

Comment -



Section 2. Identifying areas of the ecological community

Consultation questions /comments on the key diagnostic characteristics

a. In your opinion, please indicate if these key diagnostic characteristics are sufficient to identify the relevant species and areas in nature that should be included in the nationally protected ecological community – and to exclude any vegetation types (/areas) that should be excluded. If not, please show how the key diagnostic characteristics should be amended to ensure appropriate inclusion / exclusion.

Comment – It would be more efficient if the main water dependent ecotypes were listed, rather than the mixture of vegetation and subcommunities listedunder hydrology and habitat/ vegetation types. Each can then be a focus for ecological processes (already covered above).

For biological assemblages, there is a predominant focus on vegetation. There is considerable information on fauna and the functionally important groups (see above) which could also be listed.

We would recommend inclusion, not exclusion of coolibah and blackbox communities within the Macquarie Marshes: these communities are flood-dependent (for recruitment and improvements in condition) and representative of the outer floodplain. Although these woodlands are identified nationally as a threatened ecological community, they are part of the hydrological gradient of the subject “ecological community” and their conservation should be linked to the current advice document.

Exclusions should include terrestrial ecosystems as identified although this is sometimes difficult because of the terrestrialisation occurring in the Macquarie Marshes (Bino et al. 2015b). In addition, all human-made water bodies and structures, also including levee banks which are not currently listed but can be most associated with channels but not always

Consultation questions /comments on additional identification information

a. Please indicate if the survey/sampling requirements appropriate.

Comment – It is important to capitalise on government monitoring programs already in place, such as the Commonwealth Environmental Water Holder’s Science Program (Flow-Monitoring, Evaluation and Research) funded by the Commonwealth Environmental Water Holder as well prog.9 (r)0.7 (o)12(w)2.7 (6.5 ())]TJ 0 Tc ( )Tj 0.)0.6 (s12v0.6 (a)-1.5 (l)k (s12v0.9 (nt)nd)1.13 (w)2.7 (e)0.4

Section 3. Cultural significance

Consultation questions /comments on cultural significance

a. Can you provide information to support or clarify information, including anything that you don't agree with, in the draft?

Comment – The Centre for Ecosystem Science employs Danielle Flakelar, a Wayilwan woman who has provided input into the areas below.

"I have recently started with UNSW Centre for Ecosystem Services to enable Wayilwan and other Aboriginal people to access our country, work with scientists and inform decisions about our cultural values and ecological knowledge. This knowledge is shared with our people as well as students of UNSW, so that we can help mitigate the impacts of global climate change, water misuse and pollution of our waterways within Murray-Darling Basin rivers, particularly the Macquarie River

The information to support the listing of the Macquarie Marshes as an endangered or critically endangered community has provided a strong evidence base which supports my people's understanding of the degradation which has occurred to our country I support this nomination."

b. Are you able to share extra information about the cultural significance of the ecological community or surrounding landscape? If so, please provide information and advice on appropriate use, including what consent has been obtained or should be sought. Please also direct us to other appropriate people and organisations in the area who may have information.

Comment -

"Wayilwan people are disappointed that we have not been engaged by federal government and we seek to resolve this issue.

The Wayilwan name for Macquarie Marshes is Wammerawa, a very culturally significant place within the Ngiyampaa nation. As a Wayilwan woman and native title rights holder, I am proud to advocate and support for the listing of this highly significant wetlands Wammerawa. Its cultural and ecological values have been changed by diversion of water upstream and land degradation.

Wayilwan country is full of waterways and an important a floodplain landscape which connects our people, land and water up and down the Murray-Darling Basin system. Culturally, economically (l)0.6 (o)1.6 ([(p)-2.9 (le)]TJ 0 0 Tw -35 0.001 Tm3.3 (i)0.23r0 0 Tw -35 0.001 -1.5 (l)0.5 (l)0.0

Wayilwan people have witnessed and not been consulted on highly impactful change through floodplain harvesting, weirs, channels and large storage tanks that have intercepted much of the flows and flooding, below the Burrendong Dam to replenish groundwater supply. Large scale clearing of native vegetation has further diminished groundwater availability and ensured poor quality of soil and waterways which has reduced native species. It has impacted our ability to pass on cultural knowledge and practices.

be a major threat, given there is little protection to areas outside the protected area. Fire can also degrade some communities such as river red gums.

Section 5. Conservation of the ecological community

Consultation questions /comments

Comment – Priority actions need to focus on the primary threats and mitigating their impacts Each threat listed should have associated priority action. Currently this section is too broad to identify the key actions beyond generic actions of protecting, restoring, communicating and research and monitoring. The first two of protect and restore demand specific actions which can be listed. In particular, the current section does not adequately focus on priority actions in relation to the management of flows and flooding regimes, with a focus on impacts of climate change, floodplain developments and management of water for the entire catchment (see above). Much of this section inappropriately focuses on land management and not water management. There is a need for stronger focus on the mechanisms in place to protect flows to the Macquarie Marshes and the vulnerabilities to this protection. As an example, there is reference to fencing (predominantly a land management conservation initiative) but no detailed water related actions.

The advice on monitoring is not well designed or structured. If the IUCN Global Ecosystem Typology was used as a framework (as put forward at the beginning), then monitoring can focus on appropriate ecosystem functional group transitions. For example, increased water extraction may transition TF 1.3 Permanent marshes to T7 Intensive land use. An impending transition could be identified through monitoring of river gauges, inundation regimes and vegetation condition. Monitoring of quantitative thresholds will promote accountability.

b. This includes further actions that encourage appropriate use of Traditional Ecological Knowledge of First Nations and encourage more involvement of Traditional Owners and Custodians in conservation management, recovery and research.

Comment – This section relies on the advice of a Wayilwan person employed by UNSW.

b. If you can provide any additional information on the nature of the geographic distribution for the ecological community, please also provide any relevant references.

Comment -

No further information.

Consultation questions /comments on criterion 3

More recent data and analysis on trends will be available and will be incorporated when Murray-Darling Basin Plan reports are released soon. In addition to that:

a. Please provide any feedback on the preliminary assessment under Criterion 3 or further data or information that would support or update the assessment regarding trends in functionally significant species?

Comment –

Comment – Yes – all coolabah and black box areas should be included as part the community nominated.

d. Should the NSW vegetation class PCT 454 - River Red Gum grassy chenopod open tall woodland (wetland) on floodplain clay soil of the Darling Riverine Plains Bioregion and western Brigalow Belt South Bioregion be considered part of the ecological community?

Comment – If supplied by the Macquarie River and dependent on its flow and flooding it should be included.

Appendix C – Detailed description of biology and ecological processes

C58125ni

Consultation Questions

Brandis K. 2010. Colonial waterbird breeding in Australia: wetlands, water requirements and environmental flows. UNSW Sydney, PhD Thesis.

Catelotti K, Kingsford RT, Bino G, Bacon P. 2015. Inundation requirements for persistence and recovery of river red gums (Eucalyptus camaldulensis) in semi-arid Australia. Biological Conservation 184:346-356.

Chiew FHS, Potter NJ, Vaze J, Petheram C, Zhang L, Teng J, Post DA. 2014. Observed hydrologic non-stationarity in far south-eastern Australia: implications for modelling and prediction. Stochastic Environmental Research and Risk Assessment 28:3-15.

Dawson SK, Catford JA, Berney P, Kingsford RT, Capon S. 2019. Land use alters soil propagule banks of wetlands down the soil-depth profile. Marine and Freshwater Research 71:191-201.

Dawson SK, Kingsford RT, Berney P, Keith DA, Hemmings FA, Warton DI, Waters C, Catford JA. 2017a. Frequent inundation helps counteract land use impacts on wetland propagule banks. Applied Vegetation Science 20:459-467.

Dawson SK, Warton DI, Kingsford RT, Berney P, Keith DA, Catford JA. 2017b. Plant traits of propagule banks and standing vegetation reveal flooding alleviates impacts of agriculture on wetland restoration. Journal of Applied Ecology 54:1907-1918.

Higgisson W, Cobb A, Tschierschke A, Dyer F. 2022. The role of environmental water and reedbed condition on the response of Phragmites australis reedbeds to flooding. Remote Sensing 14:1868.

Keith DA, et al. 2022. A function-based typology for Earth's ecosystems. Nature:1-6.

Kingsford RT, Auld KM. 2005. Waterbird breeding and environmental flow management in the Macquarie Marshes, Arid Australia. River Research and Applications21:187-200.

Kingsford RT, Johnson W. 1998. Impact of water diversions on colonially nesting waterbirds in the Macquarie Marshes in arid Australia. Colonial Waterbirds 21:159-170.

Mason TJ, Honeysett J, Thomas RF, Popovic GC, Hosking T, Shelly DJ, Bowen S. 2022. Monitoring vital signs: wetland vegetation responses to hydrological resources in the Macquarie Marshes NSW, Australia. Austral Ecology47:1296-1314.

McLoughlin CA, Kingsford RT, Johnson W. 2024. Learning consciousness in managing water for the environment, exemplified using Macquarie River and Marshes, Australia. Marine and Freshwater Research 75:NULL-NULL.

Ocock JF, Kingsford RT, Penman TD, Rowley J. 2016. Amphibian abundance and detection trends during a large flood in a semi-arid floodplain wetland. Herpetological Conservation and Biology 11:408-425.

Ocock JF, Kingsford RT, Penman TD, Rowley JJ. 2014. Frogs during the flood: differential behaviours of two amphibian species in a dryland floodplain wetland. Austral Ecology 39:929-940.

Prosser IP, Chiew FH, Stafford Smith M. 2021. Adapting water management to climate change in the Murray–Darling Basin, Australia. Water 13:2504.

)e(8.)s(Bni i sDeinfeld C, Kingsford RT. 20130.001 Tw TrD.8 (i)-2s (n 44.5 (p)-3.8 (t)-2.9 (i).1 (a)-2-2.9 (n)-5.33 ()0.6 (i)s4.