

Supplementary material

Lacking character? A policy analysis of environmental watering of Ramsar wetlands in the Murray–Darling Basin, Australia

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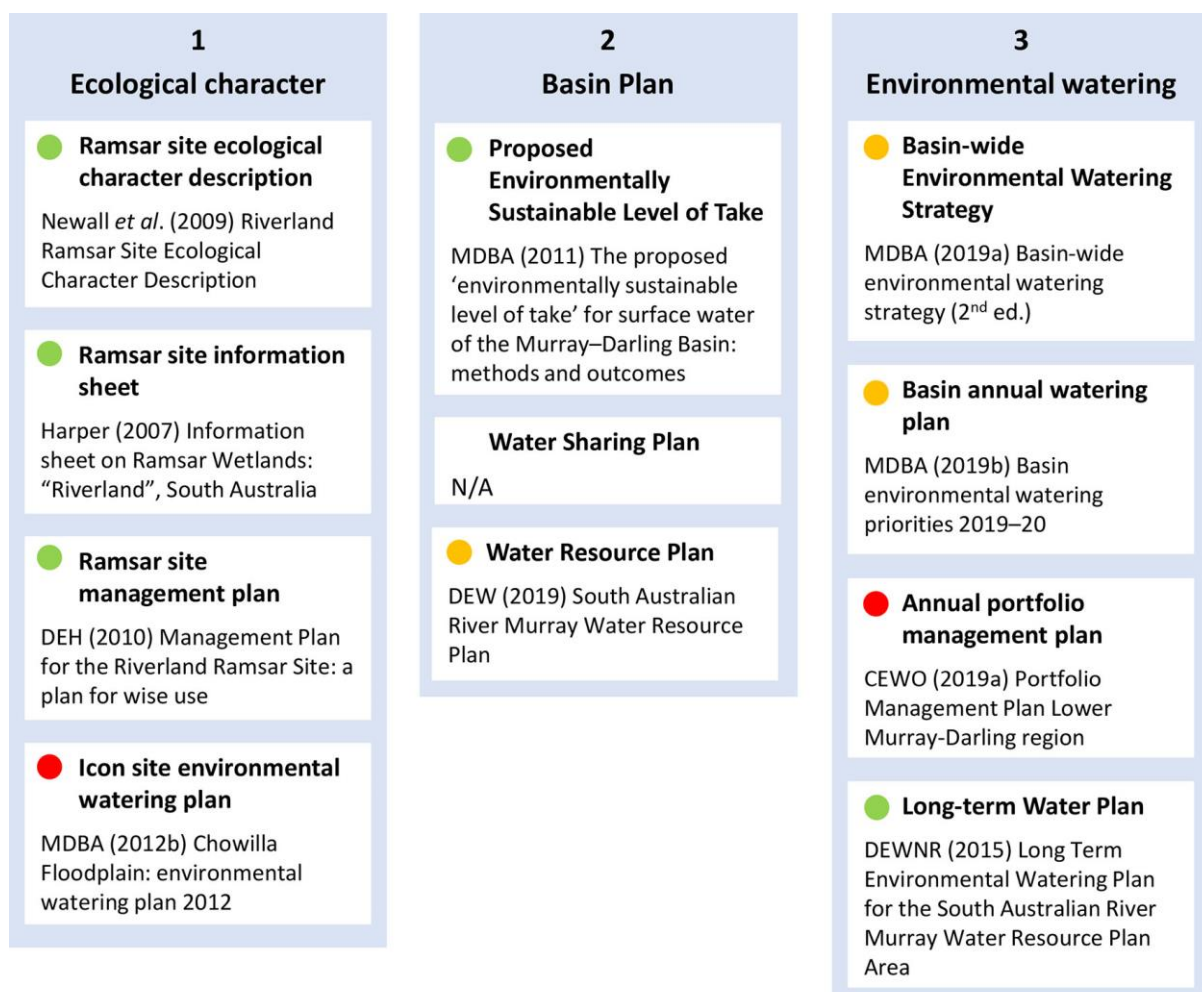


Figure S1. Documents assessed for the planning and implementation of environmental watering for the maintenance of ecological character for the Riverland Ramsar site in South Australia. Compliance ratings: green, high; orange, medium; red, low.

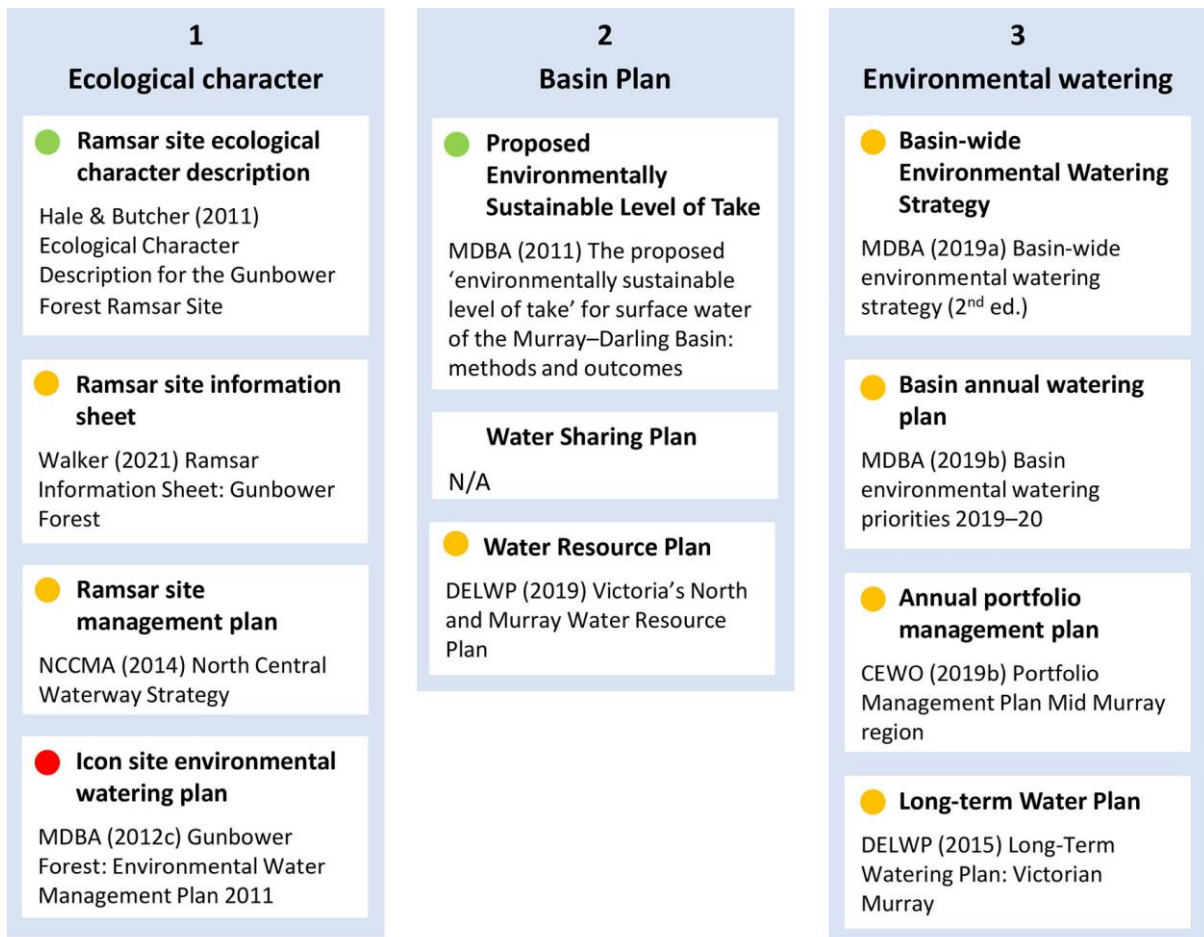


Figure S2. Documents assessed for the planning and implementation of environmental watering for the maintenance of ecological character for the Gunbower Forest Ramsar site in Victoria. Compliance ratings: green, high; orange, medium; red, low.

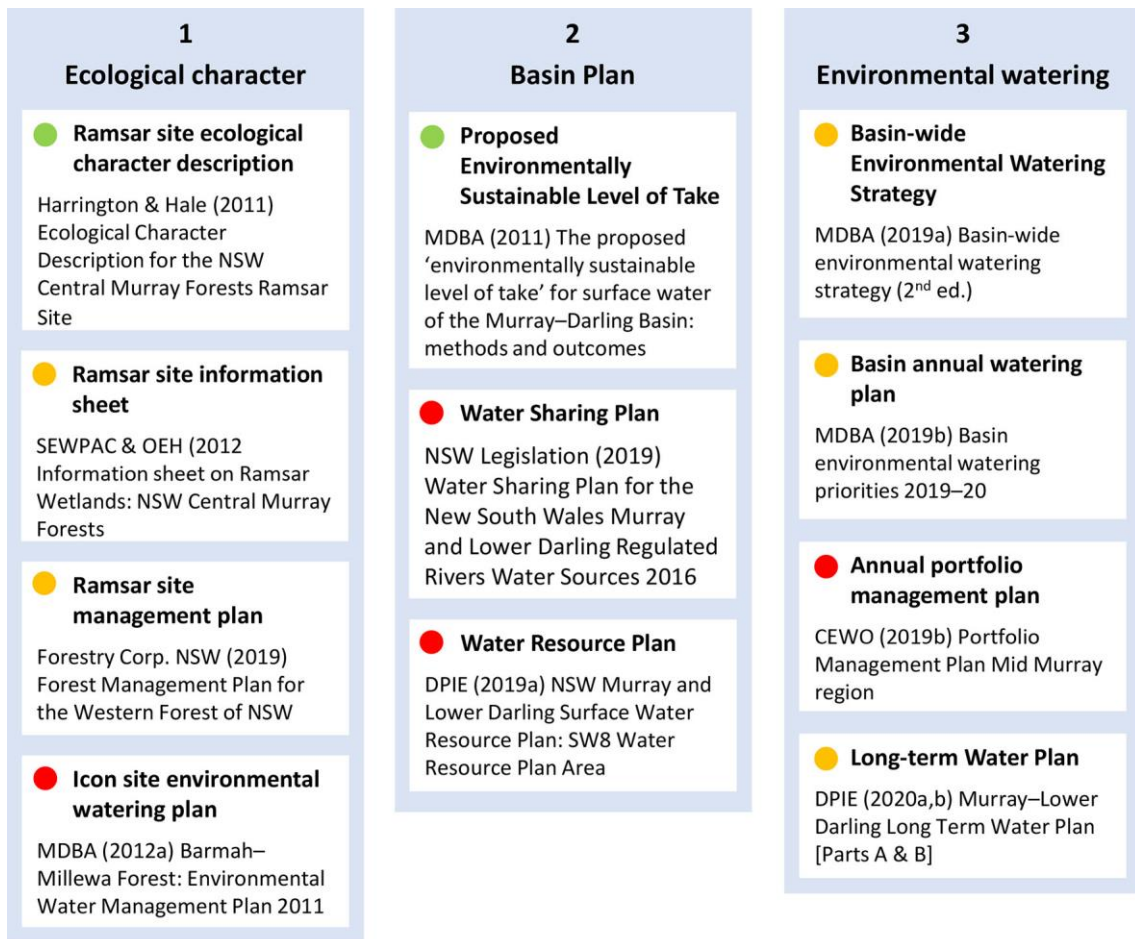


Figure S3. Documents assessed for the planning and implementation of environmental watering for the maintenance of ecological character for the Central Murray Forests Ramsar site in New South Wales. Compliance ratings: green, high; orange, medium; red, low.

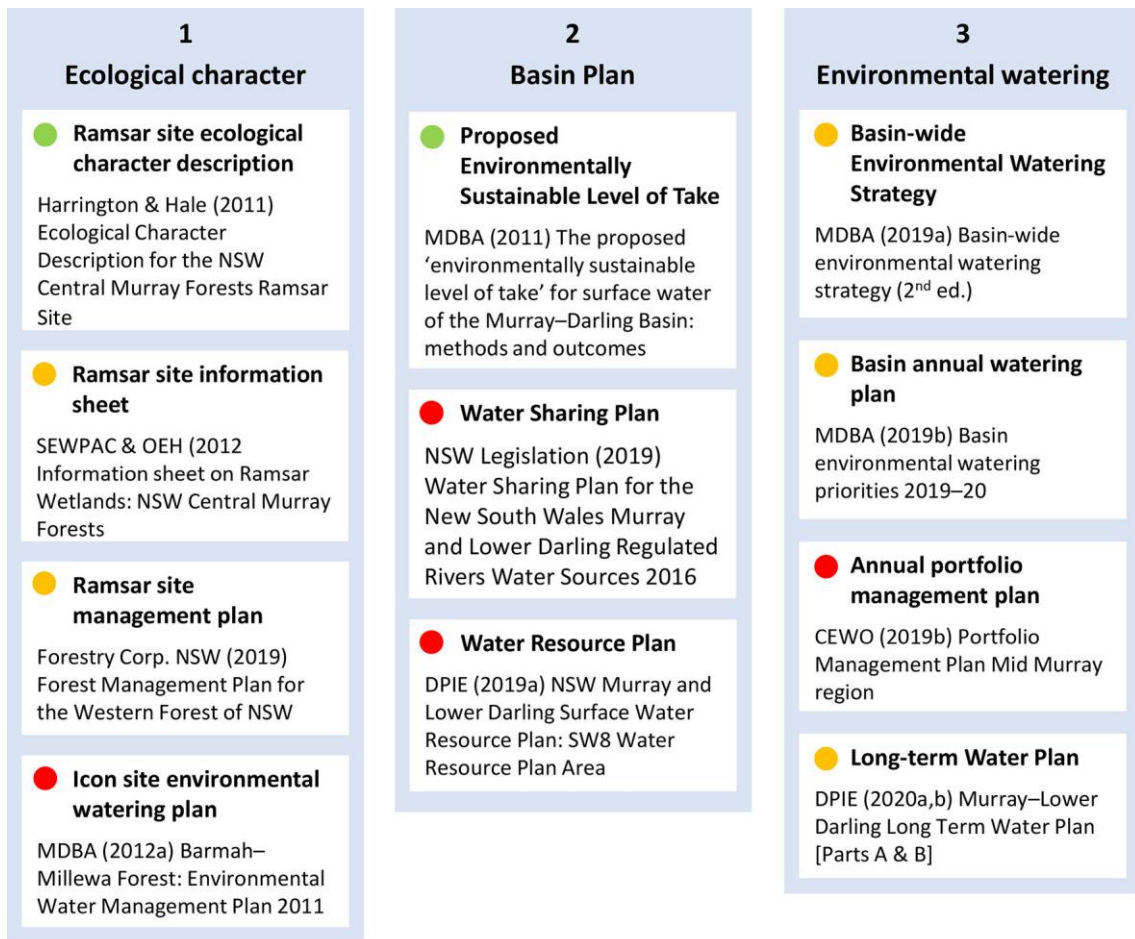


Figure S4. Documents assessed for the planning and implementation of environmental watering for the maintenance of ecological character for the Macquarie Marshes Ramsar site in New South Wales. Compliance ratings: green, high; orange, medium; red, low.

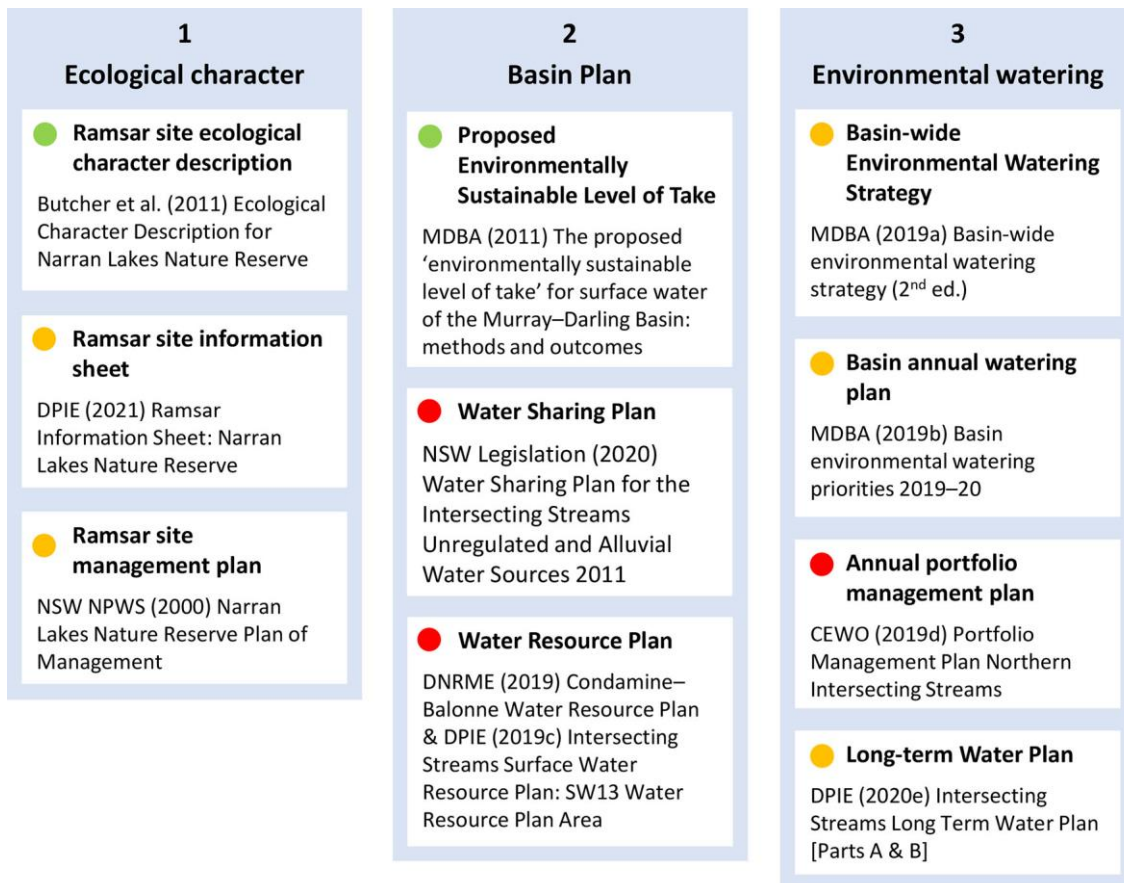


Figure S5. Documents assessed for the planning and implementation of environmental watering for the maintenance of ecological character for the Narran Lakes Nature Reserve Ramsar site in New South Wales. Compliance ratings: green, high; orange, medium; red, low.

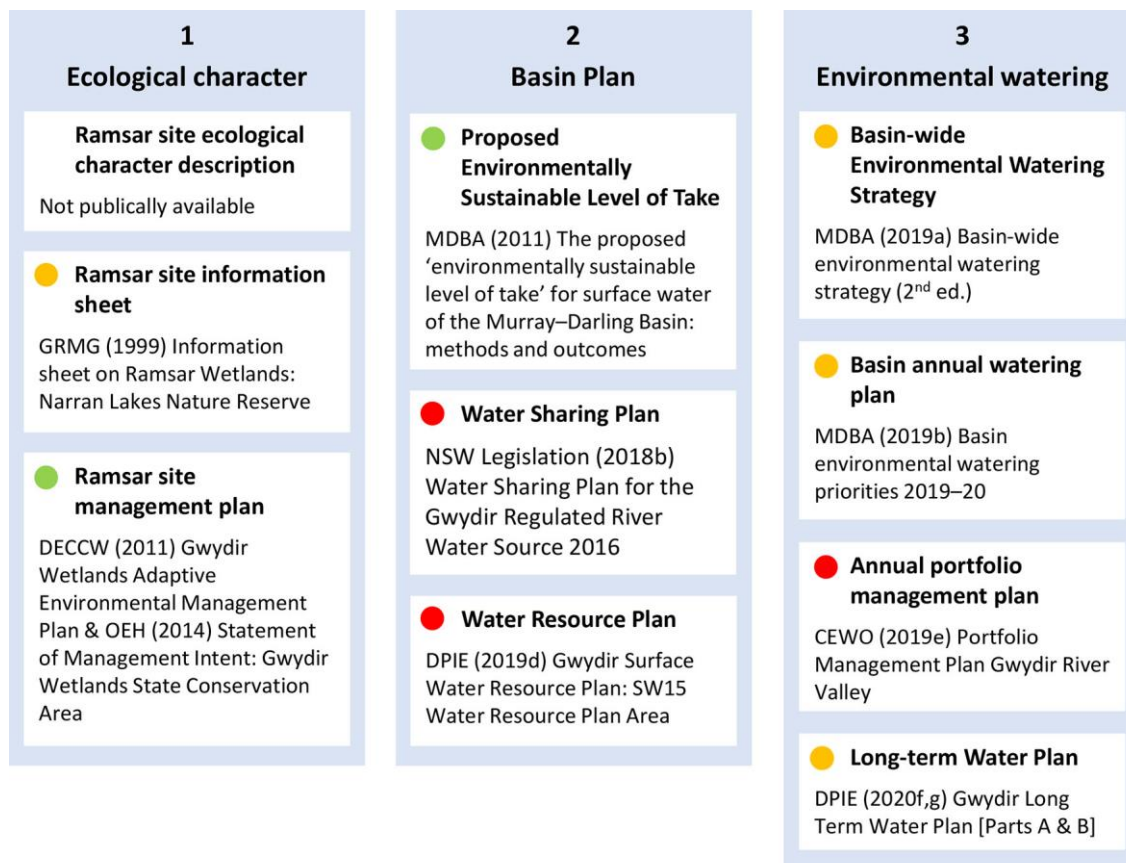


Figure S6. Documents assessed for the planning and implementation of environmental watering for the maintenance of ecological character for the Gwydir Wetlands Ramsar site in New South Wales. Compliance ratings: green, high; orange, medium; red, low.

References

- Butcher, R., Hale, J., Capon, S., and Thoms, M. (2011) Ecological Character Description for Narran Lake Nature Reserve. Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT, Australia.
- CEWO (2019a) Portfolio Management Plan. Lower Murray–Darling region. Commonwealth Environmental Water Office, Canberra, ACT, Australia.
- CEWO (2019b) Portfolio Management Plan. Mid Murray region. Commonwealth Environmental Water Office, Canberra, ACT, Australia.
- CEWO (2019c) Portfolio Management Plan. Macquarie River Valley. Commonwealth Environmental Water Office, Canberra, ACT, Australia.
- CEWO (2019d) Portfolio Management Plan. Northern Intersecting Streams. Commonwealth Environmental Water Office, Canberra, ACT, Australia.
- CEWO (2019e) Portfolio Management Plan. Gwydir River Valley. Commonwealth Environmental Water Office, Canberra, ACT, Australia.
- DECCW (2010) Macquarie Marshes: Adaptive Environmental Management Plan. Department of Environment, Climate Change and Water, Sydney, NSW, Australia.

DECCW (2011) Gwydir Wetlands Adaptive Environmental Management Plan. Department of Environment, Climate Change and Water, Sydney, NSW, Australia.

DEH (2010) Management Plan for the Riverland Ramsar Site: a Plan for Wise Use 2010–2015. Department for Environment and Heritage, Adelaide, SA, Australia.

DELWP (2015) Long-Term Watering Plan: Victorian Murray. Department of Environment, Land, Water and Planning, Melbourne.

DELWP (2019) Victoria's North and Murray Water Resource Plan Comprehensive Report. Department of Environment, Land, Water and Planning, Melbourne.

DEW (2019) South Australian River Murray Water Resource Plan. Department for Environment and Water, Adelaide, SA, Australia.

DEWNR (2015) Long Term Environmental Watering Plan for the South Australian River Murray Water Resource Plan Area. Department of Environment, Water and Natural Resources, Adelaide, SA, Australia.

DNRME (2019) Condamine–Balonne Water Resource Plan. Department of Natural Resources, Mines and Energy, Brisbane, Qld, Australia.

DPIE (2019a) NSW Murray and Lower Darling Surface Water Resource Plan: SW8 Water Resource Plan Area. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2019b) Macquarie–Castlereagh Surface Water Resource Plan: SW11 Water Resource Plan Area. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2019c) Intersecting Streams Surface Water Resource Plan: SW13 Water Resource Plan Area. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2019d) Gwydir Surface Water Resource Plan: SW15 Water Resource Plan Area. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020a) Murray–Lower Darling Long Term Water Plan. Part A: Murray–Lower Darling catchment. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020b) Murray–Lower Darling Long Term Water Plan. Part B: Murray–Lower Darling planning units. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020c) Macquarie–Castlereagh Long Term Water Plan. Part B: Macquarie–Castlereagh catchment. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020d) Macquarie–Castlereagh Long Term Water Plan. Part B: Macquarie–Castlereagh planning units. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020e) Intersecting Streams Long Term Water Plan. Parts A and B. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020f) Gwydir Long Term Water Plan. Part A: Gwydir catchment. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

DPIE (2020g) Gwydir Long Term Water Plan. Part B: Gwydir planning units. Department of Planning, Industry and Environment, Sydney, NSW, Australia.

- DPIE (2021) Ramsar Information Sheet: Narran Lakes Nature Reserve. Department of Planning, Industry and Environment, Sydney, NSW, Australia.
- Forestry Corporation of NSW (2019) Forest Management Plan for the Western Forests of NSW. Available at https://www.forestrycorporation.com.au/data/assets/pdf_file/0005/885560/hfd-western-fmp.pdf [Verified 21 March 2021].
- GRMG (1999). Information Sheet on Ramsar Wetlands: Gwydir Wetlands: Gingham and Lower Gwydir (Big Leather) Watercourses. (Gwydir Ramsar Management Group: Sydney, NSW, Australia.) Available at <https://rsis.ramsar.org/ris/993>
- Hale, J., and Butcher, R. (2011) Ecological Character Description for the Gunbower Forest Ramsar Site. Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT, Australia.
- Harper, M. (2007) Information Sheet on Ramsar Wetlands: ‘Riverland’ South Australia. (Department for Environment and Heritage: Adelaide, SA, Australia.) Available at <https://rsis.ramsar.org/ris/377>
- Harrington, B., and Hale, J. (2011) Ecological Character Description for the NSW Central Murray Forests Ramsar site. Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT, Australia.
- MDBA (2011) The proposed ‘environmentally sustainable level of take’ for surface water of the Murray-Darling Basin: Methods and outcomes. Murray–Darling Basin Authority, Canberra, ACT, Australia.
- MDBA (2012a) Barmah–Millewa Forest: Environmental Water Management Plan 2012. Murray–Darling Basin Authority, Canberra, ACT, Australia.
- MDBA (2012b) Chowilla Floodplain: Environmental Water Management Plan 2012. Murray–Darling Basin Authority, Canberra, ACT, Australia.
- MDBA (2012c) Gunbower Forest: Environmental Water Management Plan 2011. Murray–Darling Basin Authority, Canberra, ACT, Australia.
- MDBA (2019a) Basin-wide environmental watering strategy. Second edition. Murray–Darling Basin Authority, Canberra, ACT, Australia.
- MDBA (2019b) Basin environmental watering priorities 2019–20. Murray–Darling Basin Authority, Canberra, ACT, Australia.
- NCCMA (2014) North Central Waterway Strategy 2014–22. North Central Catchment Management Authority, Bendigo, Vic., Australia.
- Newall, P., Lloyd, L., Gell, P., and Walker, K. (2008) Riverland Ramsar Site Ecological Character Description. Department for Environment and Heritage, Canberra, ACT, Australia.
- NSW Legislation (2018a) Water Sharing Plan for the Macquarie and Cudgegong Regulated Rivers Water Source 2016 (2015 SI 630). (NSW Government: Sydney, NSW, Australia.) Available at <https://www.legislation.nsw.gov.au/view/html/inforce/current/si-2015-0630> [Verified 21 March 2021]
- NSW Legislation (2018b) Water Sharing Plan for the Gwydir Regulated River Water Source 2016 (2015 SI 629). (NSW Government: Sydney, NSW, Australia.) Available at <https://www.legislation.nsw.gov.au/view/html/inforce/current/si-2015-0629> [Verified 21 March 2021]

- NSW Legislation (2019) Water Sharing Plan for the New South Wales Murray and Lower Darling Regulated Rivers Water Sources 2016. (NSW Government: Sydney, NSW, Australia.) Available at <https://www.legislation.nsw.gov.au/view/html/inforce/current/sl-2016-0366> [Verified 21 March 2021]
- NSW Legislation (2020) Water Sharing Plan for the Intersecting Streams Unregulated and Alluvial Water Sources 2011. (NSW Government: Sydney, NSW, Australia.) Available at <https://www.legislation.nsw.gov.au/view/html/inforce/current/sl-2011-0573> [Verified 21 March 2021]
- NSW NPWS (1993) Macquarie Marshes Nature Reserve Plan of Management. NSW National Parks and Wildlife Service, Sydney, NSW, Australia.
- NSW NPWS (2000) Narran Lake Nature Reserve Plan of Management. NSW National Parks and Wildlife Service, Sydney, NSW, Australia.
- OEH (2011) Information Sheet on Ramsar Wetlands: Macquarie Marshes (including Macquarie Marshes Nature Reserve, Wilgara and U-block). (Office of Environment and Heritage: Sydney, NSW, Australia.) Available at <https://rsis.ramsar.org/ris/337>
- OEH (2012) Macquarie Marshes Ramsar site: Ecological character description (Macquarie Marshes Nature Reserve and U-block components). Office of Environment and Heritage, Sydney, NSW, Australia.
- OEH (2014) Statement of Management Intent: Gwydir Wetlands State Conservation Area. Office of Environment and Heritage, Sydney, NSW, Australia.
- SEWPAC and OEH (2012) Information Sheet on Ramsar Wetlands: NSW Central Murray Forests. (Department of Sustainability, Environment, Water, Population and Communities, Canberra, ACT, Australia; and Office of Environment and Heritage: Sydney, NSW, Australia.) Available at <https://rsis.ramsar.org/ris/1291>
- Walker, M. (2021) Ramsar Information Sheet: Gunbower Forest. Department of Environment, Land, Water and Planning, Melbourne, Vic., Australia.