

Currawinya Lakes Ramsar Site / Currawinya National Park

Ramsar Management Summary 2014

Prepared by: Marine Resource Management Unit, Queensland Parks and Wildlife Service, Department of National Parks, Recreation, Sport and Racing

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Purpose of this document

Queensland has five sites listed under the international Convention on Wetlands of International importance especially as Waterfowl Habitat (Ramsar Convention) — Bowling Green Bay, Shoalwater and Corio Bays, Great Sandy Strait, Moreton Bay and Currawinya Lakes. The Convention is an international treaty. The aim of the treaty is to halt the world wide loss of wetlands and conserve those that remain through wise use and management. Ramsar wetlands are recognised under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and principles for their management are outlined in Schedule 6 of the Act.

As a signatory to the Ramsar Convention, Australia has several obligations which include promoting the wise use¹ of wetlands and notifying the Convention Secretariat of changes to the ecological character² of listed Ramsar sites. It is these aspects that must be considered when managing Queensland protected areas³ that contain a Ramsar site.

The purpose of a Ramsar Management Summary (RMS) is to provide information and guidance for land managers responsible for the management of Ramsar sites. This information is derived primarily from the draft Ecological Character Description⁴ (ECD) and the Ramsar Information Sheet⁵ (RIS), developed for each site.

The focus of this document is the wetland values and management of the Currawinya Lakes Ramsar site. However, it should not be used in isolation. For more information about the values of the wetlands, the RIS should be consulted. For further information on terrestrial ecosystems, species and their management, the statutory Currawinya National Park (NP) management plan (QPWS 2001), recognised under the *Nature Conservation Act 1992* (NCA), and Currawinya NP management statement (QPWS 2011) should be consulted — or any future management instrument for the area. The RMS and management plan and statement should be used in conjunction with the State-wide principles for wetland planning and management on protected areas and other lands managed by Queensland Parks and Wildlife Service (QPWS) (QPWS 2013) (Appendix 1).

Management objective

To maintain the ecological character of the Currawinya Lakes Ramsar site through informed and appropriate management practices.

Protected area values, management plans and other information

Currawinya NP was gazetted on 11 May 1991 to protect the integrity and function of its wetlands, as well as the important habitats it provides for migratory bird species. It protects threatened and representative mulga ecosystems and wildlife; and significant Indigenous and non-Indigenous cultural heritage sites.

The management plan for Currawinya NP, which describes the natural values, threats and management intent of the park and recognises Ramsar management principles, was approved by Governor in Council in 2001. At this time the Ramsar site covered the entire national park but in 2008 a 3,570ha addition to the north-west corner of the national park was made, which enhanced the protection of the wetlands.

¹ Wise use - the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development.

² Ecological character — the combination of ecosystem components, processes, benefits, and services that characterise a wetland.

³ Protected area — refers to the classes of protected areas defined under the *Nature Conservation Act 1992*, managed by QPWS; and including national parks, conservation parks and resources reserves.

⁴ Ecological Character Description of Currawinya Lakes Ramsar site (final report) — draft 2009

⁵ Ramsar Information Sheet (RIS)— <http://www.environment.gov.au/water/topics/wetlands/database/pubs/43-ris.pdf>

Therefore, the Ramsar site currently covers approximately 97% of the national park although significant wetland values are recognised over the entire national park. Future consideration may be given to modifying the boundary of the Ramsar site to align with the national park boundary.

Size and location of the site

The Ramsar site/national park occurs on the border of Queensland and New South Wales near Hungerford, 170 km southwest of Cunnamulla (Figure 1).

Size of Ramsar site	151, 300 ha ⁶
Size of National Park⁷	154, 870 ha ⁸ (151,300 ha in 1991)
Bioregion	Mulga Lands
QPWS Region	Western
QPWS Management Unit	Southern Mulga
Catchment	Paroo River
Drainage Division	Murray Darling Basin

⁶ Ramsar area at date of listing (11 March 1996)

⁷ Declared under the Nature Conservation Act 1992 (NCA)

⁸ Includes a 3,570 ha extension to the north west corner of the park in 2008

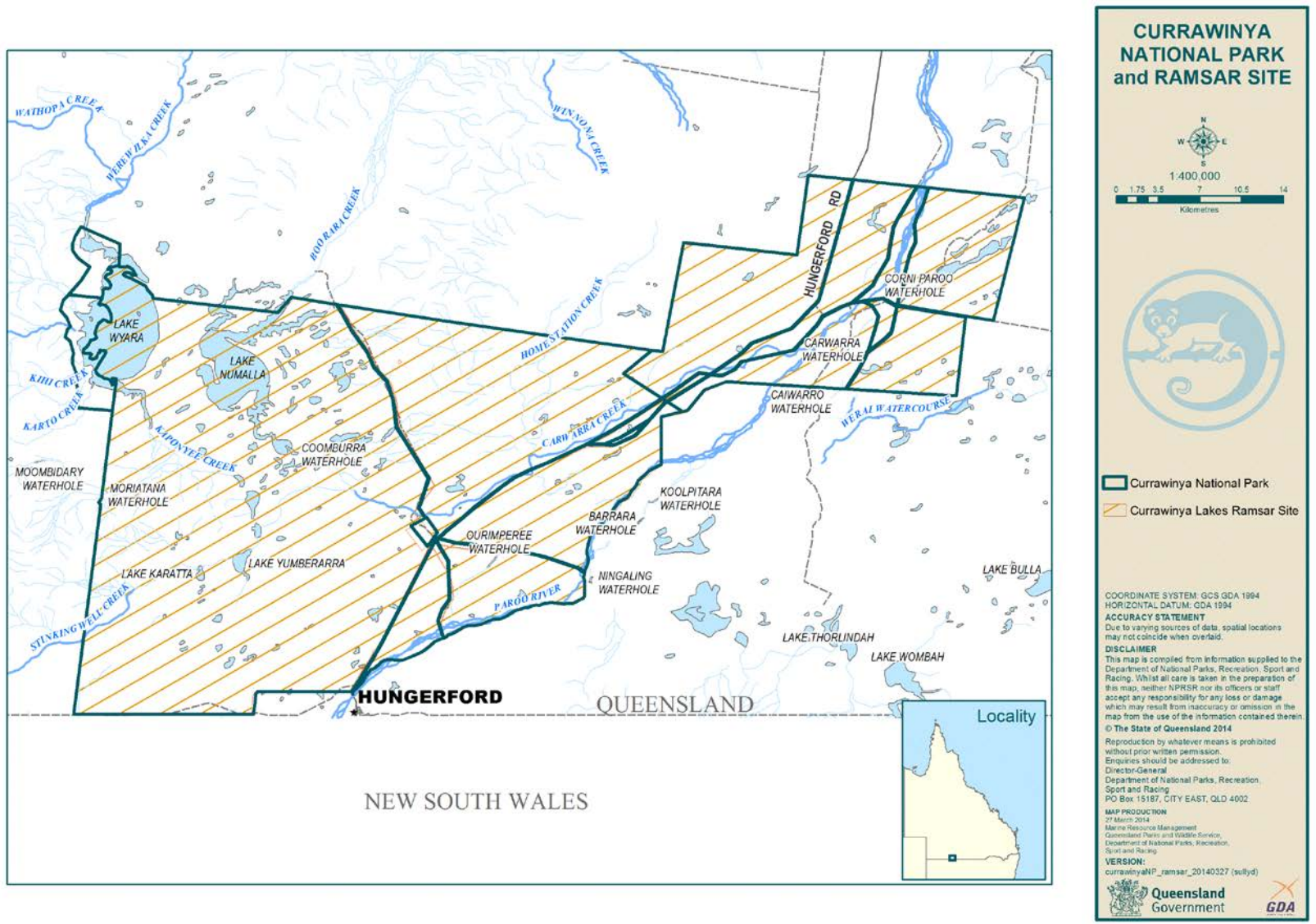


Figure 1. Map showing Currawinya National Park and the Currawinya Lakes Ramsar Site

Internationally important values of the Ramsar site

Currawinya Lakes was listed as a Ramsar site in 1996 for its outstanding wetland values and features. It fulfilled all six of the nomination criteria available at the time (Table 1). In some cases the justification provided applies to multiple criteria.

In 2009, the draft ECD stated that the site's ecological character has been maintained since being listed as a Ramsar site in 1996.

Table 1. Nomination criteria and justification for listing for the Currawinya Lakes Ramsar site

Nomination criteria		Justification
Criterion 1	Contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region	<ul style="list-style-type: none"> The site contains one of the richest and most diverse samples of wetlands in inland Australia. These wetlands are relatively natural (unmodified), and include those with a range of saline, freshwater, lacustrine (lake) and palustrine (swamp) attributes. The site also includes the rare wetland type, Great Artesian Basin Springs. The ecological community associated with these springs is listed as endangered under the EPBC Act. The wetlands occur in the Mulga Lands Bioregion, which was poorly conserved until areas were selected as part of the protected area estate — Currawinya National Park was one of the first parks in the Mulga Lands, containing typical vegetation of this bioregion.
Criterion 2	Supports vulnerable, endangered, or critically endangered species or threatened ecological communities (listed nationally or under international frameworks)	<ul style="list-style-type: none"> The site contains Great Artesian Basin Springs. The community of native species associated with these springs is listed as an endangered ecological community under the EPBC Act. The site supports the nationally and State threatened plant species <i>Sclerolaena walkeri</i> (regal pumpkin burr) — listed as vulnerable under both the NCA and EPBC Acts. The nationally threatened bird species <i>Rostratula benghalensis</i> (painted snipe) — listed as vulnerable under both the NCA and EPBC Act has been recorded at the site. The fish <i>Bidyanus bidyanus</i> (silver perch) has also been observed on the site and is listed as critically endangered under the EPBC Act.
Criterion 3	Supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region	<ul style="list-style-type: none"> The diverse wetland types and range of habitats they provide are critical in supporting the high diversity of native wildlife associated with the bioregion — of particular note is the abundance and diversity of waterbird⁹ species supported by Lake Wyara, Lake Numalla, the smaller lakes and floodplain wetlands. No other wetlands in arid or southern Australia are thought to support such high

⁹Waterbirds — describes a large and varied group of birds that are ecologically tied to bodies of water for some part of their lifecycle. Waterbirds may be migratory or non-migratory (resident). They come from the six major orders: Anseriformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Gruiformes, and Charadriiformes.

Nomination criteria		Justification
		<p>numbers of waterbirds consistently as Currawinya Lakes.</p> <ul style="list-style-type: none"> • Over 200 bird species, 17 amphibian species, 24 mammal species and 58 reptile species have been recorded at the site. • The site also supports eight native fish species from seven families. This represents almost the entire known fish diversity of the Paroo River catchment. Poorly known within the bioregion are <i>Bidyanus bidyanus</i> (silver perch) which have been recorded at the site. • Permanent waterbodies, which provide a refuge at times of drought, play a vital role in maintaining biodiversity.
Criterion 4	Supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions	<ul style="list-style-type: none"> • The site provides habitat for waterbirds for feeding and breeding. The size and storage capacity of the lakes at Currawinya make it an important habitat at large regional scales. • Islands within Lake Wyara are particularly important for colonial breeding waterbirds such as <i>Pelecanus conspicillatus</i> (Australian pelican), up to 20,000 pairs, <i>Cygnus atratus</i> (black swan), <i>Hydroprogne caspia</i> (Caspian tern), <i>Recurvirostra novaehollandiae</i> (red-necked avocet), <i>Chroicocephalus novaehollandiae</i> (silver gull) and <i>Phalacrocorax</i> spp. (cormorants). • Permanent lakes and waterholes provide a refuge for amphibians, fish, reptiles and birds during times of drought. • The Currawinya Lakes form part of an inland route for migratory shorebirds, with Currawinya National Park being a listed site within the East Asian-Australasian Flyway Site Network. Species listed under the Convention on the Conservation of Migratory Species of Wild Animals, Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA) or Republic of Korea-Australia Migratory Bird Agreement (RoKAMBA) have also been recorded at the site.
Criterion 5	Regularly supports 20,000 or more waterbirds	<ul style="list-style-type: none"> • The site, and in particular Lake Numalla and Lake Wyara, supports abundant populations of waterbirds, with counts in excess of 100,000 recorded. On occasions, more than 250,000 individuals have been recorded through aerial and ground surveys.
Criterion 6	Regularly supports one per cent of the individuals in a population of one species or subspecies of waterbird	<ul style="list-style-type: none"> • The one percent population threshold has been exceeded for at least ten waterbird species: • pink-eared duck (<i>Malacorhynchus membranaceus</i>) • Eurasian coot (<i>Fulica atra</i>) • black swan (<i>Cygnus atratus</i>) • freckled duck (<i>Stictonetta naevosa</i>) • grey teal (<i>Anas gracilis</i>) • sharp-tailed sandpiper (<i>Calidris acuminata</i>) • hardhead (<i>Aythya australis</i>) • Australasian shoveler (<i>Anas rhynchotis</i>) • banded stilt (<i>Cladorhynchus leucocephalus</i>) • red-necked avocet (<i>Recurvirostra novaehollandiae</i>).

General characteristics of the Currawinya Lakes Ramsar site

- Contains diverse wetland types (freshwater and saline lakes, riverine channels and waterholes, ephemeral lakes, salt pans, clay pans, swamps, and freshwater springs) — these have resulted from the unique geomorphology and hydrological features of the area.
- Natural hydrology of the area is considered to be the most important underlying process in maintaining wetland diversity and integrity — with the frequency, duration, size, rates of flow and timing of floods critical components.
- Demonstrates a high degree of natural variation in response to unpredictable rainfall and flooding, this being a characteristic of the semi-arid zone it occurs in.
- Paroo River system plays an important role in the flow of water throughout this landscape. The system is largely unregulated with no significant dams or weirs in the region.
- Outstanding and significant habitat for a range of important fauna species, in particular general and breeding habitat for waterbirds (including some migratory species listed under international agreements i.e. JAMBA, CAMBA and RoKAMBA).
- Contains spring wetlands fed by the Great Artesian Basin (Regional Ecosystem 6.3.23) with a *Biodiversity Status and Vegetation Management Act 1999* status of endangered. The community associated with the springs is also listed as an endangered ecological community under the EPBC Act.
- Lakes, waterholes, rivers and springs are of cultural significance to Indigenous people of the area, having ceremonial and spiritual importance. A native title claim is currently active over the park and awaits determination (Budjiti People Claim No: QC07/002; Federal Court No: QUD53/07).
- Visitors are able to undertake a number of nature-based, low-impact, recreational activities associated with the wetlands. Activities such as swimming, canoeing and kayaking are permitted on Lake Numalla, but no motorised vessels are permitted on any of the lakes. Fishing is permitted in some parts of Lake Numalla and in the Paroo River.
- The site is well-studied and continues to be an important site for conducting research on: wetlands; their water levels and sedimentation rates; climate effects; archaeology, pest species management and waterbird use.
- Properties surrounding the Currawinya Lakes area are well-timbered leasehold land used for cattle and sheep grazing.

Wetlands on the site

The nine following wetland types, according to the Ramsar classification system, occur on the site (Table 2; Figure 2):

Table 2. Ramsar wetland types on the Currawinya site

Ramsar wetland classification	Location on Currawinya NP
Type N — seasonal/intermittent /irregular rivers/streams/creeks	River channel (e.g. Paroo River) and waterholes (Corni Paroo, Kyeearing, Caiwarro and Carwarra), located on the floodplain ¹⁰ on the eastern part of the site.
Type O —permanent freshwater lakes (over 8ha)	Permanent freshwater lakes (such as Lake Numalla) and Lake Yumberrara). Lake Numalla is of particular importance for feeding waterbirds and also provides a refuge for aquatic

¹⁰ Floodplains are not considered a wetland type under the Ramsar classification system. However, floodplains in the eastern portion of the site contribute to the hydrology of the site during flood events.

Ramsar wetland classification	Location on Currawinya NP
	<p>invertebrates, fish and turtles.</p> <p>Water in Lake Numalla becomes saline as drying occurs. The lake dries very infrequently (approximately once every 20 years¹¹).</p>
<p>Type P — seasonal/intermittent freshwater lakes (over 8ha)</p>	<p>Smaller, semi- permanent lakes such as Kaponyee, Yumberarra, and Karatta. These are affected by water levels in the local catchment and the Paroo River during extreme flood events.</p> <p>The lakes become more saline as they evaporate.</p>
<p>Type Q — permanent saline/brackish/alkaline lakes</p>	<p>Permanent salt lake (e.g. Lake Wyara). The lake fills approximately every seven years and retains water for 1-1.5 years¹².</p> <p>Lake Wyara is primarily a closed lake system, only affected by extreme flood overflow (from the Paroo River). Small tributaries (e.g. Werewilka Creek) enter the lake from the northwest and it is fed by a separate catchment from Lake Numalla. It is an important breeding site for waterbirds (e.g. pelicans and black swans).</p>
<p>Type R — seasonal/intermittent saline/brackish/alkaline lakes and flats</p>	<p>Smaller, semi- permanent lakes such as Kaponyee, Yumberarra, and Karatta. These are affected by water levels in the local catchment and the Paroo River during extreme flood events.</p> <p>The lakes become more saline as they evaporate.</p>
<p>Type Sp — permanent</p> <p>Type Ss — seasonal/intermittent saline/brackish/alkaline marshes/pools</p>	<p>Various palustrine swamps associated with the central area and the broader Paroo River floodplain to the north east.</p>
<p>Type Ts — seasonal/intermittent freshwater marshes/pools on inorganic soils</p>	<p>Claypans occur in the central floodplain area. They are dependent on major flood and local rainfall events.</p>
<p>Type Y — freshwater springs</p>	<p>Great Artesian Basin spring wetlands. More than 70 springs in five broad groups have been identified, mostly in the Hoods Range area to the east of Lake Numalla, with isolated springs</p>

¹¹ According to Timms, B.V (2006). The geomorphology and hydrology of saline lakes of the Middle Paroo, arid- zone Australia. *Proceedings of the Linnean Society of New South Wales* 127: 157-174.

¹² According to Timms, B.V (2006). The geomorphology and hydrology of saline lakes of the Middle Paroo, arid- zone Australia. *Proceedings of the Linnean Society of New South Wales* 127: 157-174.

Ramsar wetland classification	Location on Currawinya NP
	in low dunefields to the east and south of Lake Numalla. All spring groups except one contain both active and inactive mounded and non-mounded (water) springs.

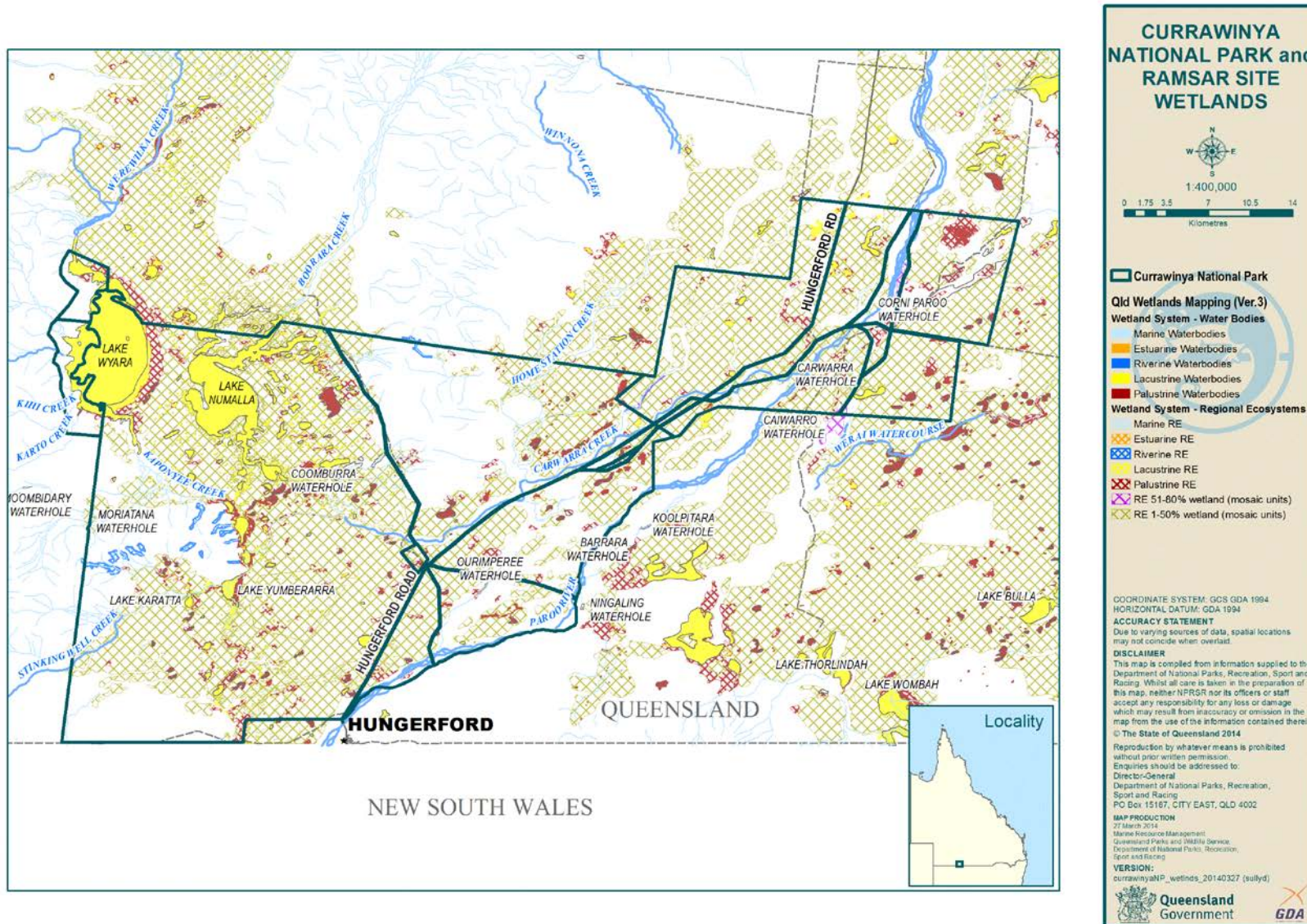


Figure 2. Wetland types mapped in Currawinya National Park

Critical components, processes and services/benefits provided by the wetlands

The National Framework and Guidance for Describing the Ecological Character of Australian Wetlands defines the ecological character of a wetland as the combination of ecosystem components, processes, and benefits and services that characterise the wetland at a given point in time.

Components are defined as the physical, chemical and biological parts or features of a wetland. Examples include physical form (e.g. wetland type, geomorphology), wetland soils (e.g. profiles, permeability, physico-chemical properties), water quality (e.g. physico-chemical properties such as salinity, pH) and biota (e.g. flora, fauna and habitats).

Processes include all those processes that occur between organisms and within and between populations and communities, including interactions with the nonliving environment, which result in existing ecosystems and that bring about changes in ecosystems over time. Ecosystem services refer to the benefits that people receive or obtain from an ecosystem. In its broadest sense they can be thought of as key values provided by the wetlands.

For the Currawinya Lakes Ramsar site seven supporting services and two cultural services have been identified. These are shown in Tables 3 and 4, along with the habitats, processes and Ramsar criteria associated with each critical service. Cultural Criteria are recognised under the Ramsar convention (Resolution IX.21).

Conceptual models identifying the critical components, processes and services for the Currawinya Lakes Ramsar site can be found in Figures 3- 6.

Table 3. Supporting critical services/benefits on the Currawinya site

Supporting critical service/benefit (1-7)	Habitats associated with the Critical Service/Benefit	Processes underlying the Critical Service/Benefit	Associated Ramsar nomination criteria ¹³
1 Unique diversity of habitats with many different wetland types represented in a 'natural' (unmodified) form	<ul style="list-style-type: none"> All wetland areas (i.e. excluding terrestrial areas — see wetland mapping for the site) 	<ul style="list-style-type: none"> Climatic Hydrological regime Geomorphologic processes such as natural sedimentation and aeolian¹⁴ processes Water quality and nutrient cycling Biological processes 	Criterion 1
2 Wildlife refuge in drought conditions for amphibians, fish, reptiles and birds	<ul style="list-style-type: none"> Permanent and nearly permanent lakes and waterholes 	<ul style="list-style-type: none"> Climatic Hydrological regime Geomorphologic processes such as natural sedimentation and aeolian processes Water quality and nutrient cycling 	Criterion 4

¹³ Refer to Table 1

¹⁴ Aeolian refers to winds ability to shape the earth through erosion and the deposition of materials.

Supporting critical service/benefit (1-7)	Habitats associated with the Critical Service/Benefit	Processes underlying the Critical Service/Benefit	Associated Ramsar nomination criteria ¹³
		<ul style="list-style-type: none"> Biological processes 	
3	<ul style="list-style-type: none"> Lake Wyara, Lake Numalla, the smaller lakes (e.g. Kaponyee, Yumberarra and Karatta) and floodplain wetlands 	<ul style="list-style-type: none"> Frequency, timing, size, rate of flow and duration of inundation Nutrient cycling 	Criteria 3, 4 and 5
4	<ul style="list-style-type: none"> Habitat for the painted snipe and silver perch includes: Lake Wyara, Lake Numalla, smaller lakes, waterholes and river channels, floodplain wetlands and vegetation communities 	<ul style="list-style-type: none"> Frequency, timing, size, rate of flow and duration of inundation 	Criteria 2,3, 4 and 5
5	<ul style="list-style-type: none"> Lake Wyara, Lake Numalla, the smaller lakes, floodplain wetlands, and other terrestrial habitats 	<ul style="list-style-type: none"> Frequency, timing, size, rate of flow and duration of inundation Biological Processes (e.g. extent of pest species) 	Criterion 3
6	<ul style="list-style-type: none"> Great Artesian Basin Springs - each individual spring varies in shape, water flow, topographic and geographic location. 	<ul style="list-style-type: none"> Groundwater hydrology - occur where groundwater discharges naturally at margins or fault lines of the Great Artesian Basin. Hydrogeological processes Rainfall and recharge rates 	Criteria 1 and 2
7	<ul style="list-style-type: none"> <i>Sclerolaena walkeri</i> occurs in and around saltpans and herblands 	<ul style="list-style-type: none"> Climatic (annual rainfall, consistency of seasons, annual temperature patterns) Hydrology and flood inundation 	Criteria 2, 3 and 4

Table 4. Cultural critical services/benefits

	Cultural critical service/benefit	Habitats associated with the Critical Service/Benefit	Processes underlying the Critical Service/Benefit	Reasons for inclusion as a critical service/benefit
1	Contains Indigenous cultural heritage values	The entire site but in particular: <ul style="list-style-type: none"> • spring areas • Paroo River and its waterholes (such as the Corni Paroo) • the major lakes (Lake Wyara and Lake Numalla) 	<ul style="list-style-type: none"> • Climatic • Hydrological regime • Geomorphologic processes such as natural Sedimentation and aeolian processes • Water quality • Biological processes 	This site demonstrates: <ul style="list-style-type: none"> • the application of traditional knowledge and methods of management that maintain ecological character • exceptional cultural traditions or records of former civilisations that have influenced the ecological character • non-material values such as sacred and ceremonial sites and their existence is linked with the maintenance of ecological character.
2	Provides for education and research on wetlands	All wetlands on the site	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • Its diverse wetlands and unique setting.

Currawinya Lakes Ramsar Site: Critical Processes, Components and Benefits/Services

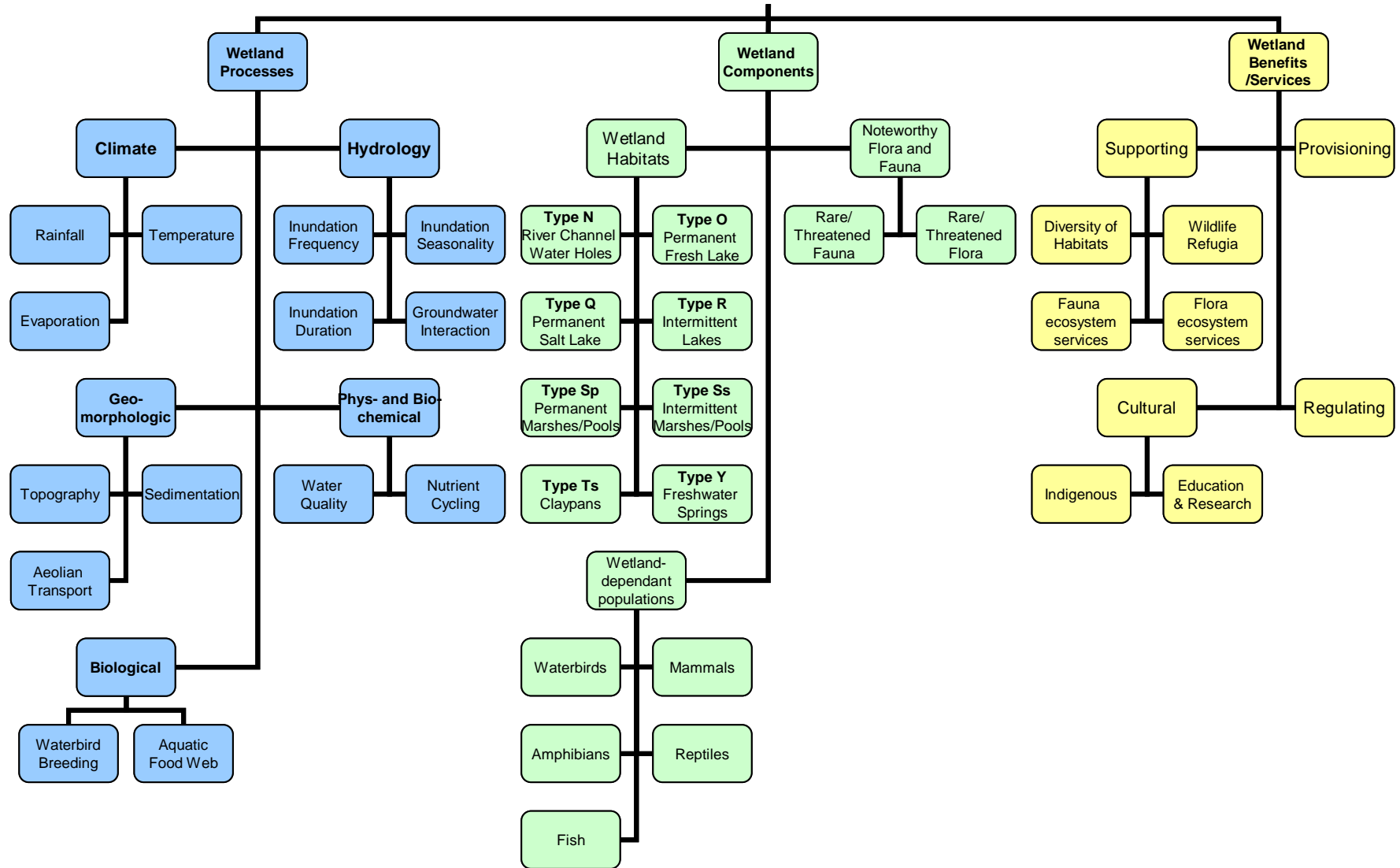


Figure 3. Conceptual model of critical services, components and processes of Currawinya Lakes Ramsar site (BMT WBM 2009).

LAKE WYARA

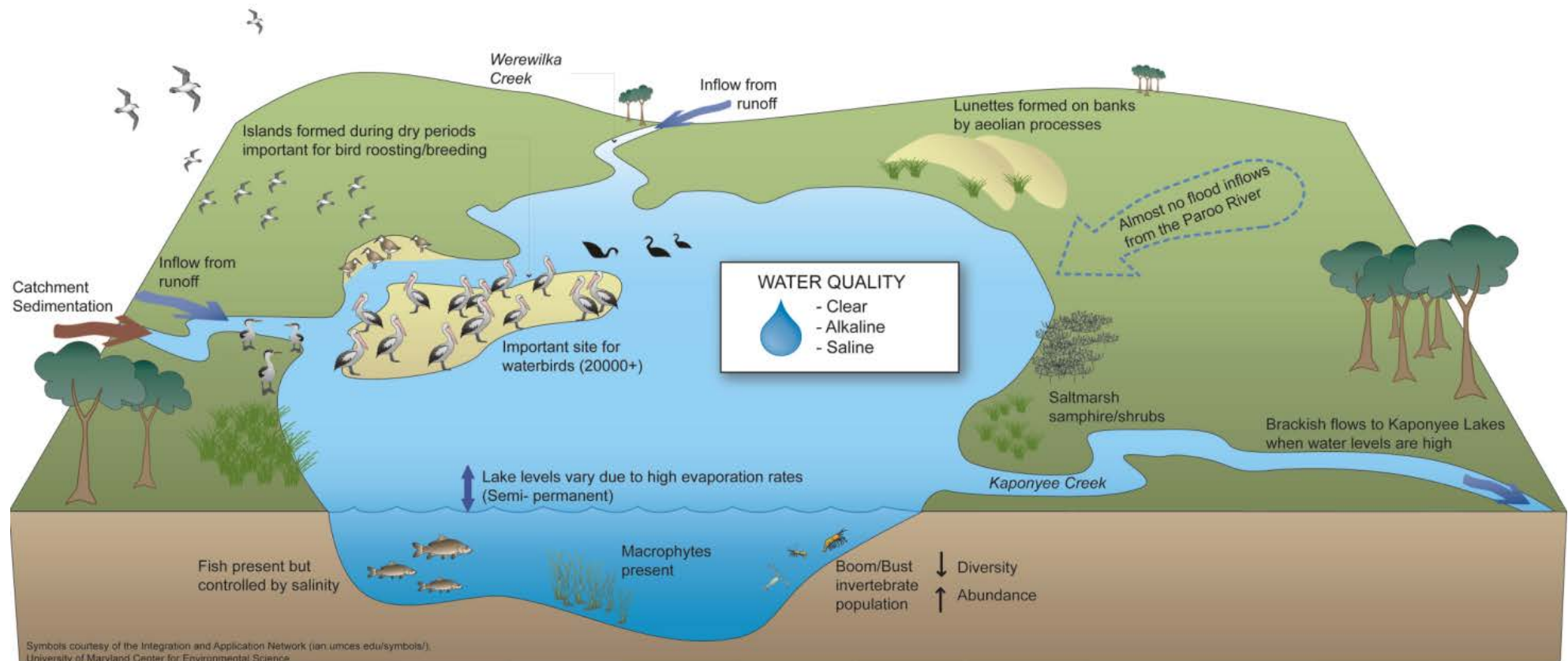


Figure 4. Conceptual model of Lake Wyara (BMT WBM 2009)

LAKE NUMALLA

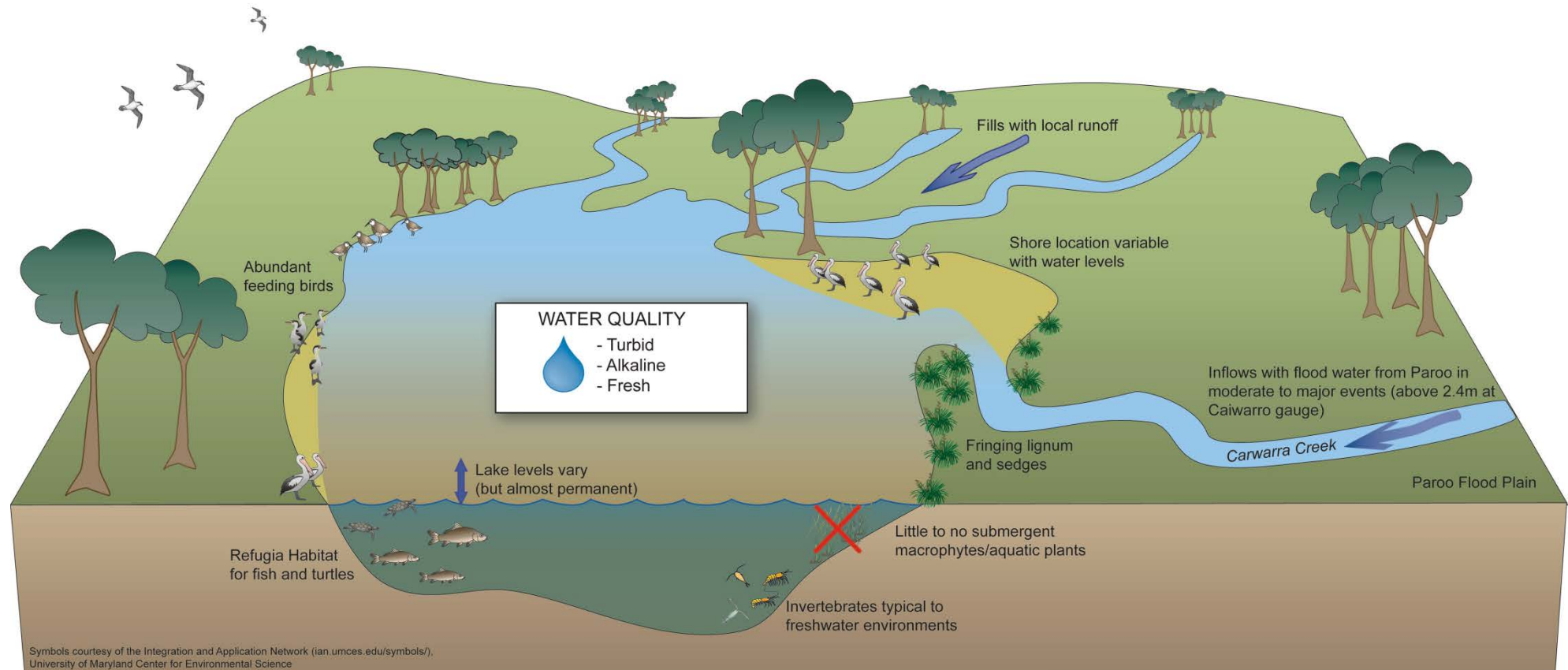


Figure 5. Conceptual model of Lake Numalla (BMT WBM 2009)

MINOR LAKES SYSTEMS

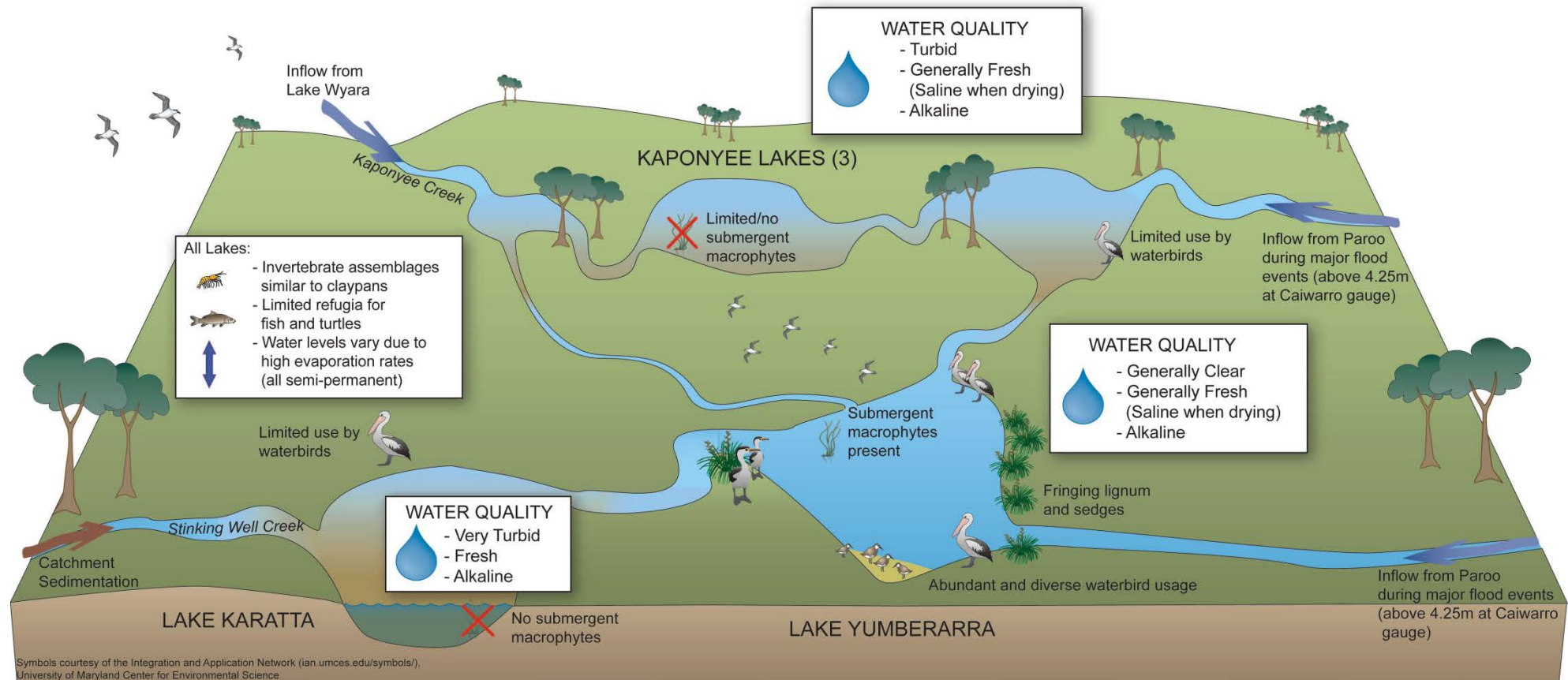


Figure 6. Conceptual model of minor lakes systems (BMT WBM 2009)

Key threats identified to ecological character

According to the draft Currawinya ECD, the ecological character of the Currawinya Lakes Ramsar site has been maintained since being listed in 1996. However, the following broad scale medium to long term threats to the ecological character of the site have been identified in the draft ECD (Table 5).

Table 5. Possible medium to long term threats to the Currawinya Lakes Ramsar site

Threat	Risk	
A change to its protected area status and water flow regime	Low	<ul style="list-style-type: none"> The site is currently provided a high level of protection due to its status as a national park under the NCA, and the largely natural flow regime occurring in the Paroo River.
Sedimentation rates in Lake Wyara and Lake Karatta	Unknown	<ul style="list-style-type: none"> Sedimentation rates could impact bird breeding areas and activities. For example when water levels are low, bird breeding islands within Lake Wyara become connected to the lake shoreline allowing predators (foxes, pigs) easier access to important bird breeding areas. Sedimentation in Lake Karatta has already resulted in an altered shape and depth of the site. However, it continues to act as a sediment basin, reducing the amount of sediment entering Lake Yumberrara. The draft ECD suggests that a more targeted survey is required to determine the real risk and extent of this threat.
Climate change	Unknown	<ul style="list-style-type: none"> Modelling scenarios by the CSIRO¹⁵ for wet and dry extreme events indicate that there could be significant impacts on the Currawinya Lakes Ramsar site wetlands. This could include an increase in the frequency of large flood events (i.e. frequency and volume of inundation and reduced salinity) or extended periods of drying (resulting in hypersaline conditions).
Non-native fish	Unknown	<ul style="list-style-type: none"> Damage to aquatic ecosystems could occur if high abundance of non-native fish (e.g. carp, goldfish and Gambusia) negatively impact native fish. The draft ECD suggests that monitoring of non-native fish is warranted; and maintaining the natural flow regime of the Paroo River is vital in maintaining conditions in which native fish can flourish.

Other threats that are on-going management issues for the site include invasive pests (goats, pigs, cats, foxes), visitor access and environmental weeds. Management approaches are set out in the Currawinya NP management plan (2001).

¹⁵ CSIRO (2007). Water availability in the Paroo. A report to the Australian Government from the CSIRO Murray-Darling Sustainable yields project. Canberra.

Any future activities or development that may affect Currawinya Lakes' Ramsar values and other matters of national environmental significance must be referred under the EPBC Act for assessment.

Management of protected areas associated with the Currawinya Lakes Ramsar site

The Currawinya Lakes Ramsar site currently covers approximately 97% of the Currawinya National Park. Therefore, management of the wetlands within Currawinya National Park should, wherever possible, be consistent with Ramsar management principles, and existing State and Commonwealth legislation, and policies and agreements relevant to the management of Ramsar sites (e.g. species of conservation concern and ecosystems, Matters of National Environmental Significance¹⁶).

In terms of the wetlands, particular consideration should be made to:

- The Ramsar management principles (Table 7) and Ramsar wise-use principles¹⁷; and
- International treaties¹⁸ for listed migratory bird species that may be associated with wetlands (e.g. JAMBA, CAMBA and RoKAMBA).
- The Currawinya National Park being listed on the East Asian – Australasian Flyway (EAAF), as an important site along the inland flyway.

Table 7. Ramsar Management Principles¹⁹

Management Principle	Description
1	Describe and maintain the ecological character ²⁰ of the wetland
2	To formulate and implement planning that promotes conservation of the wetland and wise and sustainable use of the wetland for the benefit of humanity in a way that is compatible with maintenance of the natural properties of the ecosystem
3	Wetland management should provide for public consultation on decisions and actions that may have a significant impact on the wetland
4	Wetland management should make special provision, if appropriate for the involvement of people who: (a) have a particular interest in the wetland; and (b) may be affected by the management of the wetland
5	Wetland management should provide for continuing community and technical input

¹⁶ Matters of national environmental significance (NES) are recognised under the *Environment Protection and Biodiversity Conservation Act 1999*. They include: Ramsar wetlands; migratory species listed under international treaties; the Great Barrier Reef Marine Park; EPBC Act listed threatened species and ecological communities; Commonwealth marine areas; world heritage properties; national heritage places; and nuclear actions.

¹⁷ The wise use of wetlands is defined by the Ramsar Convention as "*the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development*" http://www.ramsar.org/pdf/lib/lib_handbooks2006_e01.pdf.

¹⁸ These are treaties between the Australian Government and governments of other countries that aim to protect and conserve migratory bird species and their habitats.

¹⁹ Ramsar management principles are outlined in Schedule 6 of the *Environment Protection and Biodiversity Conservation Regulations 2000*.

²⁰ Ecological character: the combination of ecosystem components, processes, benefits, and services that characterise the wetland.

Furthermore, as outlined in Schedule 6 of the Environment Protection and Biodiversity Conservation Regulations 2000, management planning should be done in accordance with the following:

- At least one management plan should be prepared for each declared Ramsar wetland.
- A management plan for a declared Ramsar wetland should:
 - (a) describe its ecological character
 - (b) state the characteristics that make it a wetland of international importance under the Ramsar Convention
 - (c) state what must be done to maintain its ecological character
 - (d) promote its conservation and sustainable use for the benefit of humanity in a way that is compatible with maintenance of the natural properties of the ecosystem
 - (e) state mechanisms to deal with the impacts of actions that individually or cumulatively endanger its ecological character, including risks arising from
 - (i) physical loss, modification or encroachment on the wetland; or
 - (ii) loss of biodiversity; or
 - (iii) pollution and nutrient input; or
 - (iv) changes to water regimes; or
 - (v) utilisation of resources; or
 - (vi) introduction of invasive species; and
 - (f) state whether the wetland needs restoration or rehabilitation
 - (g) if restoration or rehabilitation is needed — explain how the plan provides for restoration or rehabilitation
 - (h) provide for continuing monitoring and reporting on the state of its ecological character
 - (i) be based on an integrated catchment management approach
 - (j) include adequate processes for public consultation on the elements of the plan
 - (k) be reviewed at intervals of not more than 7 years.

A number of management actions (Table 8a and 8b) that relate to wetland or Ramsar management have been identified in existing QPWS documents for Currawinya National Park²¹. Broader management considerations such as pests, fire and visitor impacts, which can also impact on the wetlands are not included in this RMS. It should be noted that the ability of QPWS to implement these management actions is dependent on the availability of resources.

²¹ Currawinya National Park Management Plan 2001; Currawinya National Park Management Statement 2011.

Table 8a. Management actions outlined in the Currawinya Management Plan 2001²²

Desired Outcome	Actions and Guidelines relevant to Ramsar wetlands
<p>Native animals²³:</p> <ul style="list-style-type: none"> The diversity of animal species and populations of noteworthy animal species are maintained. The habitats of all species, especially those with specific habitat requirements (such as feeding areas for migratory waders and breeding sites for the near threatened freckled duck), are protected. 	<ul style="list-style-type: none"> Visitor activities in sensitive areas will be strictly regulated (e.g. access to the lakes area will be restricted during peak waterbird breeding seasons). Staff access to certain areas (e.g. pelican rookeries) may also be restricted unless prior approval has been obtained from the District Manager, Charleville. Noteworthy, i.e. near threatened and threatened native animals, will be researched and/or monitored in order to develop a better appreciation of their biology, habitat requirements, and breeding and migratory patterns. Locations where noteworthy species have been recorded will be monitored regularly to ensure minimal disturbance to populations and associated habitats, particularly through the impacts of introduced species and human interference. Park staff will liaise with researchers and the Queensland Museum to benefit from studies involving native animal species found within the park, and will promote research into understanding the ecological requirements and vulnerability of recognised endemic, near threatened, threatened and introduced species recorded in the park. Park staff will liaise with appropriate research institutions and specialists to establish a broad information base and network of contacts to monitor the security of nomadic and migratory species. Any action which has, will have, or is likely to have a significant impact on a Matter of National Environmental Significance (including a Ramsar wetland, listed threatened species and ecological communities and/or listed migratory species) should be referred to the Environment Minister to determine whether the action is subject to the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. Before the development of any new infrastructure, the site and its surrounds will be surveyed to identify any potential threats (e.g. water pollution, visitor access to critical habitat) to noteworthy native animal species. Populations of noteworthy species will be retained by investigating their habitat utilisation/requirements and formulating management strategies which will promote populations and habitats (e.g. suitable fire regimes).
<p>Landscape, soil, wetland and catchment protection:</p> <ul style="list-style-type: none"> The natural scenic qualities of the park's environment are maintained. Degraded areas of the park are rehabilitated and further impacts in these areas have been limited. 	<ul style="list-style-type: none"> Natural hydrological processes will be permitted to continue throughout the park with a minimum of interference. Existing soil erosion problems will be identified and, where possible, countered, using measures such as the diversion of runoff, controlling access, revegetation with local plant species, and stock/feral animal control. Flood frequency will be considered when selecting appropriate erosion control measures along watercourses.

²² Desired outcomes and actions taken directly from the Currawinya National Park Management Plan 2001.

²³ Native in this context is also includes migratory birds that inhabit the site that are not technically native animals.

Desired Outcome	Actions and Guidelines relevant to Ramsar wetlands
<ul style="list-style-type: none"> • The park is protected from the negative impacts of upstream catchment management practices and off-park land use practices. • Soil erosion and compaction damage in the national park are minimal. • The components, process and services/benefits (i.e. the site's ecological character) of the park's wetland systems are maintained. 	<ul style="list-style-type: none"> • Erosion control and rehabilitation measures will be included as part of any park developments. Accordingly, Recreation Zones will, where possible, be located on more stable soils. • Any action which has, will have, or is likely to have a significant impact on the ecological character of the Currawinya Lakes Ramsar site should be referred under the <i>Environment Protection and Biodiversity Conservation Act 1999</i>. In relation to lakes and wetland systems, consideration to be given to: access to and use of sites, impacts on birdlife and other native animals, impacts on the lake edge native plants, reclamation plans for degraded sites, initiating an education program to raise awareness of the significance of maintaining the integrity of the wetlands systems. • Further research and monitoring of the wetland systems will be encouraged and supported. • Any form of degradation of the park's wetland systems attributable to human causes will be countered by changes to permitted use levels, increased patrols or other actions considered necessary. • Vehicular access will be restricted to stable areas. All tracks will be appropriately maintained, with particular emphasis given to drainage and appropriate siting of any new sections of track. • Park management staff will liaise with neighbouring landholders on conservation measures to protect the integrity of the park's wetland systems. • Sedimentation within the wetland systems will be monitored and minimised where it is of non-natural causes. • Methods of trapping sediment will be investigated to alleviate sedimentation caused by road runoff. • An appropriate monitoring program for the assessment of water quality in the park will be developed. • Park staff will maintain knowledge of current and proposed land management practices in the larger catchment which can impact on the wetlands within the park and further downstream (e.g. water quality and flow rate, creek integrity and soil stability).
<p>Resource harvesting:</p> <ul style="list-style-type: none"> • Sources of underground and surface water have been assessed and are being used appropriately. 	<ul style="list-style-type: none"> • Avoid any actions which have the potential to significantly pollute watertables. • Monitor water quality, for consumption and environmental purposes, through standardised procedures for collection, recording and analysing of data established by the Queensland Government. • Progressively regulate underground water supplies and, where possible, use such facilities during park management activities such as firefighting and road construction. • Undertake research into the impacts that the control of water sources will have on native and introduced plant and animal species. • Any action which has, will have, or is likely to have a significant impact on a Matter of National Environmental Significance (e.g. Ramsar Wetland, listed threatened species and ecological communities, listed migratory species) should be referred

Desired Outcome	Actions and Guidelines relevant to Ramsar wetlands
	under the <i>Environment Protection and Biodiversity Conservation Act 1999</i> .

Table 8b. Management actions outlined in the Currawinya Management Statement 2011²⁴

Desired Outcome	Actions and Guidelines relevant to Ramsar wetlands (Action number)
<p>Species and ecosystems of conservation significance:</p> <ul style="list-style-type: none"> • Protect the integrity and maintain ecological processes within wetland systems. • Monitor sensitive habitats and threatened species, and ensure their requirements are reflected in management programs. 	<ul style="list-style-type: none"> • Management actions will be in accordance with Ramsar management principles (A1). • Encourage research into and monitor the distribution, abundance and habitat condition of species of conservation significance and use findings to adapt park management where appropriate (A3). • Actions from recovery plans (species or ecological communities) will be implemented where possible (A4). • Place a high priority on relationships with organisations associated with existing programs related to the conservation of significant species and ecosystems including Artesian spring wetlands (RE 6.3.23) and waterbirds – see Appendix 2.

Knowledge gaps

Key information gaps identified in the draft ECD for Currawinya Lakes Ramsar site are as follows:

- Resolution of different wetland typologies such that indicator/reference sites for each main wetland type can be assigned and monitored over time.
- Empirical data concerning the extent to which Paroo waterholes and more permanent lakes, such as Lake Numalla and Lake Yumberarra, provide refuge for aquatic vertebrates.
- Up-to-date systematic collection of data (since 1998) on patterns of waterbird usage in the major lake systems particularly as a drought refuge.
- Up-to-date systematic data collection (since 1998) on use of the site by the freckled duck.
- Targeted surveys in relation to the painted snipe and grey snake (data collected to date has been from broader fauna surveys).
- Systematic or regular data collection regarding vertebrate fauna (other than waterbirds).
- In the context of the artesian springs, information or data from which to assess the potential positive impact of bore capping.
- Targeted surveys for threatened plant species.
- In the context of cultural heritage services, information available regarding:
 - spatially definable sites of cultural heritage significance;
 - extent of current knowledge systems and identification of these systems associated with wetland types; and
 - extent of traditional management systems/practices being implemented that may have an impact on the ecological character of the wetland.
- Greater verification of field observations about the frequency and duration of inundation at the major lakes and waterholes from Paroo River in-flows.

²⁴ Desired outcomes and actions taken directly from the Currawinya National Park Management Statement 2011.

- The relationship between ecological communities, hydrology and water quality in the major lakes systems at full, half full and near empty levels such that longer term trends on hydrology and water quality from climate change can be assessed.
- The extent, rate and implications of sedimentation in Lake Wyara, with specific consideration of impact on bird breeding islands.
- Implications of climate change on the hydrology and ecology of the site.

Monitoring recommendations

The draft ECD proposes monitoring recommendations (Table 9). These recommendations recognise the limitation of physical and financial resources. The recommendations may have to be adopted by agencies outside of or in partnership with QPWS and may be dependent on available resources and state wide priorities.

A comprehensive monitoring plan for the Ramsar site is provided in Appendix B of the draft ECD. The activities outlined cover:

- Lake and water ecology, hydrology and water quality (Theme 1)
- Sedimentation and breeding birds in Lake Wyara (Theme 2)
- Wetland reference sites for waterbirds, threatened flora and fauna surveys (Theme 3).

Table 9. Monitoring priorities for the Currawinya Lakes Ramsar site²⁵

Ramsar monitoring objectives	Recommended monitoring activities	Reason for monitoring
Detecting change in ecological character	<ul style="list-style-type: none"> • Periodic observation of wetland features (e.g. water levels, changes in topography, drainage and flow paths, flora assemblages including weed presence, wildlife surveys). • Water quality/condition measurements in the major water-bodies (e.g. salinity, pH, dissolved oxygen and turbidity). • Sampling of fish and invertebrates periodically (e.g. every 5-10 years). • Targeted survey of threatened flora and fauna (e.g. every 5-10 years). • Periodic counts of breeding and feeding waterbirds with a particular focus on those listed under Ramsar Criterion 6 (i.e. pink-eared duck; Eurasian coot; black swan; freckled duck; grey teal; sharp-tailed sandpiper; hardhead; Australasian shoveler; banded stilt; red-necked avocet). 	Baseline monitoring to facilitate determining whether an observed change is within natural limits or not.
Flood flows and water quality	<ul style="list-style-type: none"> • Installation of flood gauge at Lake Numalla — to determine flow volumes and river heights. • Installation of graduated poles in minor lakes (Yumberarra, Karatta and Kaponyee) — to observe depth changes. • Salinity, Turbidity, pH, and dissolved oxygen measurements for lakes at full, half and near empty levels (Wyara, Numalla, Yumberarra, Karrata, Kaponyee and permanent waterholes). • Examine community structure and condition indicators: <ul style="list-style-type: none"> - macroinvertebrate composition and abundance; - <i>Ruppia</i> sp. and other macrophyte sampling (in Lake Wyara and Yumberarra); - fish and turtle (species, size classes and abundance) 	Maintenance of hydrological processes, and flood inflows from the Paroo River system are fundamental to all critical services and habitats.
Sedimentation in Lake Wyara	<ul style="list-style-type: none"> • Sediment core sampling in the western part of the lake, at the mouth of inlets. • Installation of graduated poles near the bird breeding island (to assist depth observations). • Conduct bird surveys on the bird breeding island and correlate them with water levels over time. 	To determine the impact of the extent and rate of sedimentation on bird breeding islands within Lake Wyara.

²⁵ Monitoring priorities as recommended in the Currawinya Lakes Ramsar site draft ECD.

Ramsar monitoring objectives	Recommended monitoring activities	Reason for monitoring
Presence and trends in non-native fish	<ul style="list-style-type: none"> Monitoring of fish populations, and the ratio between native and non-native species. Monitor effects of predation by waterbirds on non-native fish. 	To ascertain the potential damage/health of aquatic ecosystems; and determine the effect of non-native fish on waterbirds.

Communication, education and awareness for the Ramsar site

Where possible the following considerations and key messages related to the Currawinya Lakes Ramsar site should be reflected and integrated in the public contact and interpretive material prepared for Currawinya National Park (e.g. web information, brochures, factsheets, signs).

1. That Currawinya Lakes is a Wetland of International Importance, listed under the Ramsar Convention.
2. The uniqueness of the area, and the diversity and naturalness of the wetlands and habitats provided within the national park and associated Ramsar site.
3. The importance of the natural hydrological regime in maintaining the wetlands and their associated Ramsar values.
4. The scientific research and educational significance and opportunities provided by the site/national park.
5. The importance and functioning of the site/national park as a refuge for birds and other wildlife during times of drought, and as habitat for migratory birds.

In addition, the following principles in relation to communication, education and awareness messages for wetlands are recommended²⁶.

a. Ensure tourism or recreational activities in or in proximity to wetlands do not detract from the Ramsar wetland values, or inappropriately disturb wetland-dependant wildlife. For example:

- When developing strategies and actions relating to tourism and visitor use and management, this should be reflected in the designation of management zones and the visitor capacity allowed in the wetland and its surrounds.
- Where sensitive or threatened wetland values occur at Ramsar sites or other conservation significant wetlands (e.g. disturbance of migratory birds), the management zone status should be based on the conservation of natural values.

b. Develop community and landholder awareness of, and respect for, the values and benefits of wetlands; and involve them in their management. For example:

- Ensure people who have a particular interest in the wetland or who may be affected by wetland management are consulted during the development of management plans for areas containing Ramsar sites, particularly where these provide a hydrological or ecological connectivity in the landscape.
- Ramsar wetlands should be included in interpretive information for an area, as well as any interpretation section of a management plan. Interpretive information (including information available on the Department of National Parks, Recreation, Sport and Racing (NPRSR) website, on signs or in brochures) and actions within management plans should enhance tourism and visitor experiences, knowledge and appreciation of the wetlands.
- Management plans should support opportunities to develop partnerships with organisations and that will foster education and research into wetlands.

²⁶ Communication, education and awareness messages based on the QPWS guideline "State-wide principles for wetland planning and management on protected areas and other lands managed by Queensland Parks and Wildlife Service (QPWS)"(Attachment 1: Principles 10-12)

c. Consider the establishment and operation of strategically located wetlands interpretation and education centres.

- Interpretive material (including information available on the NPRSR website, on signs or in brochures) for QPWS managed areas containing Ramsar wetlands should highlight the significance, value and benefits of the wetlands to enhance tourism and visitor experiences, and knowledge and appreciation of the site.

References

Australian Government 2013, *Australian Ramsar Wetlands*, Australian Government, Department of Sustainability, Environment, Water, Population and Communities, <http://www.environment.gov.au/cgi-bin/wetlands/ramsardetails.pl?refcode=43> , viewed February 2013.

Australian Government 1999, *Currawinya: Information Sheet on Ramsar Wetlands*, Australian Government, Department of Sustainability, Environment, Water, Population and Communities. <http://www.environment.gov.au/water/topics/wetlands/database/pubs/43-ris.pdf> , viewed February 2013.

BMT WBM 2009, *Draft Ecological Character Description of the Currawinya Lakes Ramsar Site*, prepared for the Queensland Government, Environmental Protection Agency, Brisbane, Australia.

QPWS 2001, *Currawinya National Park Management Plan*, Queensland Government, Queensland Parks and Wildlife Service, Brisbane, Australia.

QPWS 2011, *Currawinya National Park Management Statement*, Queensland Government, Queensland Parks and Wildlife Service, Brisbane, Australia.

QPWS 2013, *QPWS Guideline: State-wide principles for wetland planning and management on protected areas and other lands managed by QPWS*, Queensland Government, Queensland Parks and Wildlife Service, Brisbane, Australia.

Appendix 1 - State-wide principles for wetland planning and management on protected areas and other lands managed by QPWS

Guideline

Wetland planning and management

State-wide principles and guidelines for wetland planning and management on protected areas* and other lands* managed by Queensland Parks and Wildlife Service (QPWS)

This document provides principles and guidelines for incorporating wetlands into the management of protected areas and other lands managed by QPWS, in particular those wetlands recognised internationally under the Ramsar Convention.

Background

Wetlands provide a range of environmental, social and economic benefits to Queensland and are an important part of the QPWS managed estate. However, a significant challenge to effectively managing and protecting these habitats is determining that a wetland actually exists at a site. This is a consequence of many of Queensland's wetlands being transient or ephemeral in nature — meaning that wetlands are not always obvious or wet at all times.

Queensland possesses five sites recognised under the international Ramsar convention (Bowling Green Bay, Shoalwater and Corio Bay, Great Sandy Strait, Moreton Bay and Currawinya Lakes) and has 210 sites of national significance listed in the Australian Directory of Important Wetlands. Ramsar wetlands are recognised under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. A number of species that visit these wetlands are also recognised under international treaties which aim to protect and conserve migratory bird species and their habitats (e.g. JAMBA, CAMBA, RoKAMBA and the Bonn Convention). As signatory to the Ramsar convention, Australia has a number of obligations including: describing each site in an ecological description, maintaining the ecological character* of the wetland, and notifying the convention of any changes to the wetland.

The principles, guidelines and information outlined below provide guidance for incorporating wetlands into the management of protected areas and other lands managed by QPWS — from policy through to onground management, monitoring and public awareness. These measures deliver relevant objectives from the Queensland Government policy document, *Strategy for the conservation and management of Queensland's wetlands* (Queensland EPA, 1999).

Note: these principles, guidelines and information are in addition to existing legislative requirements, policies and procedures outlined for protected area management planning (such as Traditional Owner and public consultation, visitor management, and pest and fire management). The list of principles, guidelines and information provided below is not exhaustive, and will be revised as additional information becomes available.

Overall objective:

- **To avoid or minimise the loss or degradation of wetland values and functions on protected areas and other lands managed by QPWS.**

* indicates terms included in the glossary of terms.

State-wide principles and guidelines for wetland planning and management on protected areas and other lands managed by QPWS

Principles

The following list of principles will assist in achieving the overall objective. Guidelines, background and information sources related to these principles are provided in the Wetland Management Principles and Guidelines table below.

Principles for wetland identification and characterisation

1. Identify the presence and location of wetlands on QPWS managed areas using up-to-date wetland mapping information.
2. Confirm the type, characteristics and representativeness of the wetland/s.
3. Identify the environmental values and ecosystem services provided by the wetland and its conservation status/significance*.
4. Identify threats and the impact of surrounding land uses on the wetland's environmental values and ecosystem services.
5. Utilise existing terminology and tools developed by the Queensland Wetland Program (QWP) * to describe and characterise wetlands.

Principles for wetland management

6. When managing a wetland consider its conservation status/significance*, and ensure consistency with State and Commonwealth legislation and other wetland policies/agreements.
7. Integrate the special requirements of wetlands when developing management plans, methods for undertaking onground management and other management related documents/tools.
8. Base the management and use of wetlands within QPWS managed areas on ecologically sustainable management and integrated catchment management practices.
9. Implement onground management that recognises and restores, maintains or enhances wetland environmental values (WEVs).
10. Ensure management of tourism or recreational activities in or in proximity to wetlands does not detract from other wetland values, or inappropriately disturb wetland-dependant wildlife.
11. Develop community and landholder awareness of, and respect for, the values and benefits of wetlands; and involve them in their management.
12. Consider the establishment and operation of strategically located wetlands interpretation and education centres.

Table: Wetland management principles and guidelines, background and information sources

Guidelines, background and information sources	
Wetland identification and characterisation	
1. Identify the presence and location of wetlands on QPWS managed areas using up-to-date wetland mapping information.	Queensland wetlands In 2005, Queensland supported 6.33 million hectares of wetlands, which covered about 3.7 per cent of Queensland. The total area of wetlands comprises 2.82 million hectares of palustrine wetlands (i.e. swamps), 1.75 million hectares of riverine wetlands, 1.22 million hectares of mangroves and saltflats and 0.55 million hectares of lacustrine wetlands (i.e. lakes). The greatest area and density of wetlands in Queensland occurs in the more arid Gulf, Lake Eyre and Bulloo drainage divisions. Only a fraction of the area mapped as wetland is permanently inundated with water.

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Wetland definition

Many definitions for a wetland exist. The Queensland Wetland Program (QWP) definition, which is used as the foundation for wetland mapping in Queensland, is based on a definition developed for the Queensland government's *Strategy for Conservation and Management of Queensland's Wetlands* document (Queensland EPA, 1999); international, national and state definitions, and through a series of workshops with stakeholders.

Wetlands are defined as:

"areas of permanent or periodic/intermittent inundation, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 metres. To be a wetland, the area must have one or more of the following attributes:

1. *The land supports, at least periodically, plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle*
2. *The substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers*
3. *The substratum is not soil and is saturated with water, or covered by water, at some time."*

What this means is that wetlands include rivers, streams, swamps, lakes, estuaries, mangroves, subterranean areas, and even farm dams. In fact the definition covers most areas that get wet for an extended period of time. To confuse things, wetlands can often be dry.

Wetland mapping

Wetland mapping for Queensland is available through a number of sources, all derived from the same source data which is periodically updated and specified as a version. Currently Version 3.0, released in Feb 2012, updates Version 2.0 wetland mapping from 2005 to 2009 information. The wetland data comes in a number of datasets — lines (relating to streams), polygons (relating to lakes, swamps and mangroves), points (relating to springs and bores) and wetland regional ecosystems (REs). For further information about the mapping methodology see the Wetland Mapping and Classification Methodology (<http://www.epa.qld.gov.au/wetlandinfo/resources/static/pdf/MappingMethod/p01769aa-1.pdf>).

There are three readily available mapping options:

- **WetlandInfo*** — Interactive mapping is available through *WetlandMaps* and static maps in PDF and KML (with a satellite map as a base layer) formats are available under the "Get maps and data section" (<http://www.epa.qld.gov.au/wetlandinfo/site/MappingFandD/WetlandMapsAndData.html>). **Note:** *WetlandMaps* should be viewed using the Mozilla Firefox web browser.
- **Ecomaps** — under the layer category Biologic and Ecologic (sub-category Wetland Program) there are a number of layers that correspond to the information available on *WetlandInfo*.
- **Enterprise GIS** for ArcGIS users (layers available under the folder: Biologic_and_Ecologic. You can also download these data layers online from the Queensland Government Information Service (QGIS).

Note: Wetland REs — All mapped wetlands are also allocated to one or more regional ecosystem (RE). One of the categories within the Regional Ecosystem Description Database (REDD) is wetlands, and this can provide initial information to a user that an area contains a wetland. The conservation status of the RE (as a whole) is also provided as a Queensland *Vegetation Management Act 1999* status and by the Biodiversity Status (http://www.ehp.qld.gov.au/ecosystems/biodiversity/regional-ecosystems/conditions_of_use.html). While the Vegetation Management Act Status is based on an assessment of the pre-clearing and remnant extent of a RE, the Biodiversity Status, which is considered in protected area management planning, also considers the condition of the RE and threats to it.

Note 2: Due to the scale of wetland mapping small wetlands less than 1 ha may not be mapped.

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<p>2. Confirm the type, characteristics and representativeness of the wetland/s.</p>	<p>If a wetland has been mapped a range of information is available to further characterise it and how it functions.</p> <p>Wetland systems Queensland wetlands are broadly divided into six different systems based on their general characteristics:</p> <ul style="list-style-type: none"> • lacustrine (lakes and dams); • palustrine (swamps, marshes and fens); • estuarine (estuaries); • riverine (rivers and creeks); • marine (ocean); and • subterranean (i.e. groundwater wetlands). <p>Wetland mapping (as described in Principle 1) demarcates lacustrine wetlands in yellow, palustrine in red/brown, estuarine in orange, riverine in deep blue and marine in pale blue. Wetland systems are described fully in the <i>Wetland Mapping and Classification Methodology</i> (Queensland EPA 2005) found on <i>WetlandInfo</i> at: http://www.epa.qld.gov.au/wetlandinfo/site/WetlandDefinitionstart/WetlandDefinitions/Systemdefinitions.html.</p> <p>Wetland typology Lacustrine and palustrine wetlands are further characterised into types using a classification system based on attributes collated during the mapping process (such as the wetland system, climate, water type, water regime, geomorphology/topography, soil, vegetation). A typology based on combining the attributes has been applied at a state-wide scale and can further assist in characterising the wetland and lead to additional sources of information (e.g. conceptual models, management profiles). Information about the typology and associated conceptual models and management profiles can be obtained directly through wetland mapping interface on <i>WetlandInfo</i> (http://www.epa.qld.gov.au/wetlandinfo/site/MappingFandD/WetlandMapsAndData.html), and links to individual conceptual models and management profiles are available on <i>WetlandInfo</i> at: http://www.epa.qld.gov.au/wetlandinfo/site/WetlandDefinitionstart/WetlandDefinitions/Typologyintro/Typology.html.</p> <p>Wetland representativeness The issue of representativeness of wetlands in areas managed by QPWS has not been resolved but a similar methodology to that described above (i.e. a classification system based on attributes) is most likely to be used as the basis for determining representativeness.</p> <p>Wetland science Scientific information about how wetlands function is integral to the understanding and effective management of QPWS managed areas. However, wetland science is as diverse, abundant and complex as the natural systems it seeks to understand, and new information is continually being generated that can challenge old ways of thinking. Until now it has been difficult to keep track of the wealth of new wetland science findings and research projects relevant to Queensland wetlands. <i>WetlandInfo</i> has been developed to fill this gap by providing access to the best wetland science available, along with interpretive information in a range of formats. Wetland conceptual models are one of the tools available to assist understanding about how wetlands function. Conceptual models for different wetland types and some site specific wetlands are located on <i>WetlandInfo</i> at: http://www.epa.qld.gov.au/wetlandinfo/site/ScienceAndResearch/ConceptualModels.html.</p>
<p>3. Identify the environmental values and ecosystem services provided by the wetland and its conservation status/significance*.</p>	<p>Wetland Environmental Values (WEVs) and Ecosystem Services When it comes to protecting or managing a wetland it is important to determine the Wetland Environmental Values (WEVs) or what are sometimes referred to as Ecosystem Services. WEVs are the individual physical and biological characteristics associated with a particular wetland that provide its ecological, social and economic benefits. Some examples of WEVs that are particularly relevant to QPWS managed areas include:</p>

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- naturalness and visual amenity;
- hydrological processes/connectivity;
- ecological connectivity;
- species and/or habitat diversity/richness (particularly flora and fauna dependent on the habitat);
- Traditional Owner associations;
- cultural resources;
- threatened or priority species or habitat (associated with the wetland);
- special or unique features (e.g. landform, conservation significance);
- sediment trapping or stabilisation;
- nutrient cycling and food webs;
- mitigation of impacts associated with altered climate conditions;
- coastal shoreline and bank stabilisation and storm protection;
- flood control/mitigation;
- recreation;
- tourism;
- education; and
- research.

A full list of environmental values has been developed by the Queensland Wetlands Program (QWP) and is available on the *WetlandInfo* website:

<http://www.epa.qld.gov.au/wetlandinfo/site/factsfigures/WetlandValues.html>.

Conservation status/significance*

There are many different processes which are used to determine the conservation significance of wetlands. In relation to these principles and guidelines the term **conservation status** is used to mean wetlands identified as being of significance either through Australian (e.g. Ramsar, Directory of Important Wetlands) or Queensland legislation (e.g. *Vegetation Management Act 1999*).

The term **conservation significance** is used more broadly to mean wetlands considered as important from a biodiversity perspective, and identified through Queensland government policies, tools and methodologies (e.g. regional ecosystem mapping, Biodiversity Planning Assessments (BPA), Aquatic Conservation Assessments (ACA), Areas of Ecological Significance (AES), and wetland mapping). It is also used to describe wetlands that may provide habitat for wildlife recognised as threatened under Australian and Queensland legislation, and wetlands that provide ecological and hydrological connectivity.

The department of Environment and Heritage Protection (EHP) has a method for assessing aquatic conservation values in Queensland. The Aquatic Biodiversity Assessment and Mapping Method (AquaBAMM) is a comprehensive method that identifies relative wetland (riverine or non-riverine) conservation values within a specified study area (usually a catchment). The method is used to produce an Aquatic Conservation Assessment (ACA) of wetlands within a study area using available data (including expert opinion information). The results provide a decision support tool that can be interrogated through a Geographic Information System (GIS) platform. These layers are available on Ecomaps under Biologic and Ecologic\Aquatic Conservation Assessments.

<http://www.epa.qld.gov.au/wetlandinfo/site/SupportTools/AssessmentMethods/AquaBAMM.html>; and

<http://www.epa.qld.gov.au/wetlandinfo/site/SupportTools/AssessmentMethods/Toolbox/3.html>.

A list of methods for assessing wetlands is also available through *WetlandInfo* Assessment toolbox

(<http://www.epa.qld.gov.au/wetlandinfo/site/SupportTools/AssessmentMethods.html>).

Wetland Indicator Species (WIS)

Most plants and animals depend on water for life, so it is not surprising that wetlands are species-rich. However, because of the dynamic nature of wetlands, with periods of drying and inundation varying in frequency and duration over time, not all plants and animals that

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	<p>live in wetlands are present in them all of the time. Animals considered wetland indicator species (WIS) are those that exhibit specific adaptations that make them dependent on wetlands for at least part of their life cycle. Lists of wetland flora and fauna indicator species are provided through the <i>WetlandInfo</i> website (http://www.epa.qld.gov.au/wetlandinfo/site/factsfigures/FloraAndFauna.html).</p> <p>Note: The wetland status of a species is also provided on Wildnet under taxon details.</p>
<p>4. Identify threats and the impact of surrounding land uses on the wetland's environmental values and ecosystem services.</p>	<p>Wetland threats</p> <p>The health and environmental values of a wetland (including its ecological and hydrological connectivity) can be altered or destroyed by activities occurring on the wetland itself, or in the surrounding landscape. Threats to wetland environmental values may include:</p> <ul style="list-style-type: none"> • aquatic and terrestrial pest plants and animals; • fire or inappropriate fire regimes; • recreation and tourism activities that disturb or destroy wetland function (e.g. motorised water sports or four wheel driving in or near critical waterbird habitats); • loss and decline of riparian and wetland vegetation; • vegetation and habitat loss surrounding the wetland; • adjacent land uses (e.g. agriculture, development or other infrastructure); • mining and other resource use activity; • inappropriate grazing regimes; • water pollution and nutrient enrichment; • sediment accumulation and suspension; • overland flow (stormwater run-off); • altered hydrology (including water extraction or water diversions); and • altered climate conditions. <p>Another way of looking at threats is to consider them as stressors that impact the condition of an ecosystem. A range of stressor models for wetlands have been developed as part of the QWP including:</p> <ul style="list-style-type: none"> • aquatic sediments; • bacteria/pathogens; • biota removal/disturbance; • conductivity; • hydrological and ecological connectivity; • habitat removal; • hydrology; • litter (rubbish); • nutrients; • organic matter; • pest (animal, plant) species; • pH; and • toxicants. <p>Pressure, condition, management and vulnerability indicators and their associated conceptual models can be found on <i>WetlandInfo</i> at: http://www.epa.qld.gov.au/wetlandinfo/site/SupportTools/MonitoringExtentAndCondition/Str essormodeloverview.html.</p> <p>Impacts of adjacent land use</p> <ul style="list-style-type: none"> • Surrounding land uses (e.g. agriculture, irrigation) can have significant impacts on wetlands and must be considered when developing onground management actions to maintain the quality and functions of wetlands within QPWS managed areas (e.g. water quality, hydrological and ecological connectivity). • Information about the surrounding tenures and land uses can be found on EcoMaps (cadastral and land planning/base parcel tenure) or through ArcGIS. Aerial information about the landscape in areas adjacent to the wetland can be

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	<p>obtained through Google Earth, and wetland mapping tools on <i>WetlandInfo</i> (i.e. KML maps and the interactive <i>WetlandMaps</i> tool). These sources of information will assist in determining the connectivity and potential threats to wetlands.</p>
<p>5. Utilise existing terminology and tools developed by the Queensland Wetland Program (QWP) * to describe and characterise wetlands.</p>	<p>The Queensland Wetlands Program (QWP) has developed a “<i>first-stop-shop</i>” for information and tools that can assist wetland managers or anyone with an interest in wetlands (http://www.epa.qld.gov.au/wetlandinfo/site/). This information has been developed from a Queensland perspective, and wherever possible should be used to provide consistency when describing and characterising wetlands.</p> <p>The information and tools available include:</p> <ul style="list-style-type: none"> • mapping applications (interactive or static) delivered through WetlandMaps ; • report tools; • definitions and classifications for wetlands; • environmental values associated with wetlands (known as Wetland Environmental Values (WEVs)); • Wetland Indicator Species (WIS) — flora and fauna lists associated with a wetland; • a wetland information capture system for users (known as Wetland Information Capture (WIC)); • wetland management profiles; • conceptual models; • stressor/threat models; • planning and legislation toolbox; • nationally and internationally important wetlands information (i.e. for Ramsar and the Australian Directory of Important Wetlands); and • many other sources of information. <p>A factsheet describing the available QWP tools can be found at http://wetlandinfo.derm.qld.gov.au/resources/static/pdf/information-sheets/fact-sheet-program-tools-updated-feb-2012.pdf.</p>
<p>Wetland management</p>	
<p>6. When managing a wetland consider its conservation status/significance*, and ensure consistency with State and Commonwealth legislation and other wetland policies/agreements.</p>	<p>Queensland possesses the most diverse array of wetlands in Australia, a number of which are considered to be of international and/or national significance. Five wetlands are listed under the international Ramsar convention (Bowling Green Bay, Shoalwater and Corio Bay, Great Sandy Strait, Moreton Bay and Currawinya Lakes), and 210 are nationally recognised in the <i>Directory of important Wetlands Australia</i>.</p> <p>The management of Queensland wetlands in protected areas should be consistent with State and Commonwealth legislation, and policies and agreements (e.g. threatened species and ecosystems, matters of national environmental significance (NES)). Particular consideration should be made to:</p> <ul style="list-style-type: none"> • Ramsar management principles for areas containing Ramsar wetlands, and Ramsar wise-use principles* for other wetlands; and • International treaties for listed migratory bird species that may be associated with wetlands (i.e. JAMBA, CAMBA and RoKAMBA, Bonn Convention). <p>Ramsar wetlands</p> <p>The Convention on Wetlands (Ramsar, Iran, 1971), which is more commonly known as the Ramsar convention, is an international treaty which aims to halt the worldwide loss of wetlands and conserve those that remain through wise use and management. As a signatory to the Ramsar convention Australia has a number of obligations including: describing each site in an ecological description, maintaining the character of the wetland,</p>

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and notifying the convention of any changes to the wetland. Draft ecological character descriptions (ECDs) are available for each site in Queensland.

Ramsar wetlands are recognised under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, both in terms of management principles and as a matter of National Environmental Significance (NES) (see below).

Australian Directory of Important Wetlands (DIWA)

Wetlands that meet criteria for “national importance” are listed in *A Directory of Important Wetlands in Australia* (DIWA) — an inventory of information about a particular wetland (e.g. conservation values, ecosystem services, landscape, species) that meets the criteria for “national importance”.

The Directory is a cooperative project between the Australian and Queensland Government (or other States and Territories). It contains 210 sites in Queensland. However, it is not a comprehensive list of significant wetlands as many more than this would meet the nationally significant criteria set for the DIWA. It is proposed to be updated or replaced in the future using contemporary inventory methods. For further information about individual Ramsar sites or wetlands in the directory see the Australian Government’s Wetland Database: <http://www.environment.gov.au/water/topics/wetlands/database/index.html>.

Matters of National Environmental Significance (NES)

A number of wetland- related matters are recognised as matters of national environmental significance (NES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Any action that has, or is likely to have a significant environmental impact on a NES matter requires approval from the Australian Government. NES matters can relate to:

- Ramsar wetlands;
- migratory species listed under international agreements (see below);
- the Great Barrier Reef Marine Park;
- EPBC listed threatened species and communities;
- Commonwealth marine areas;
- world heritage properties;
- national heritage places; and
- nuclear actions.

Further information on NES matters can be found on the Australian Government website: <http://www.environment.gov.au/epbc/protect/index.html>.

Ramsar management principles

Ramsar wetlands in Australia are recognised under the EPBC Act, and a set of Ramsar management principles to manage these internationally recognised wetlands are outlined in Schedule 6 of the *Environment Protection and Biodiversity Conservation Regulations 2000*.

While Queensland does not currently have any Commonwealth recognised Ramsar management plans, any management plan for a QPWS managed area which contains a Ramsar wetland should, wherever possible, align with the following principles:

1. **Describe the ecological character* of the wetland**
2. **Include actions to maintain the ecological character**
3. **Promote and describe actions to conserve the wetland**
4. **Promote and describe actions for the wise and sustainable use of the wetland for all people** — compatible with and not impacting on the properties of the ecosystem
5. **Include public consultation**
6. **Include the involvement of people who have a particular interest in the wetland and who may be affected by wetland management (e.g. through a public consultation process)**

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7. **Provide for processes that provide for continuing community and technical input** (e.g. 10 year review of plans, research and monitoring programs described within the plan)
8. **Include a description of the characteristics that make the wetland a Ramsar site** (i.e. how it fulfils the criteria)
9. **Describe actions to deal with threats to ecological character** (e.g. physical loss or modification, loss of biodiversity, pollution and nutrients, altered water regimes, resource utilisation, invasive species).
10. Describe actions to restore or rehabilitate the wetland
11. **Consider continuing monitoring and reporting on the wetland's ecological character**
12. **Be based on an integrated catchment management approach**
13. Allow for a review process within seven years (Note: Parks requirement is currently includes a 10 year review)
14. Include assessment under statutory environmental impact assessment and approval processes for actions likely to have a significant impact on the wetland's ecological character.

Note: the items in **bold** are those that apply most to the QPWS management plan process.

Information that can assist in aligning management plans with Ramsar management principles include the following site specific documents:

- **Ecological Character* Description (ECD)** report — Draft versions of these documents are currently available.
- **Ramsar Information Sheet (RIS)** — available from the Australian Government Wetlands Database (<http://www.environment.gov.au/water/topics/wetlands/database/index.html>).
- **Ramsar rolling review in the site status form (SSF)** — this was completed for the first time in 2010 in collaboration with QPWS officers as part of a pilot program to provide a standardised and consistent reporting mechanism to facilitate future reporting on changes, if any, to the ecological character of the site.

For further information about the national guidelines for Ramsar wetlands see the Australian Government website (<http://www.environment.gov.au/water/topics/wetlands/ramsar-convention/australian-guidelines.html>).

International treaties for migratory birds

These are treaties between the Australian Government and governments of other countries that aim to protect and conserve migratory bird species and their habitats. These treaties protect terrestrial, waterbird* and shorebird* species which migrate between Australia and the respective countries — the majority of species listed on these treaties are shorebirds. The loss of wetland habitat, both in terms of quantity and quality, is recognised as a significant threat to migratory birds, which can travel up to 26,000 km each year to reach breeding sites in the northern hemisphere and non-breeding sites in the southern hemisphere.

International treaties for migratory birds include the:

- Japan-Australia Migratory Bird Agreement (JAMBA);
- China-Australia Migratory Bird Agreement (CAMBA);
- Republic of Korea-Australia Migratory Bird Agreement (RoKAMBA); and
- Bonn Convention (also known as the Convention on Migratory Species (CMS)), which includes some migratory bird species.

Migratory species listed under these treaties are recognised under the EPBC Act and are considered a matter of NES (described above).

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	<p>Lists of migratory species can be found on the Australian Government website (http://www.environment.gov.au/cgi-bin/sprat/public/publicshowmigratory.pl). WildNet also provides status information for individual species in relation to these treaties — viewed through the status link at the bottom of the taxon details page. A species list search for CAMBA, JAMBA, RoKAMBA, or Bonn listed species can also be conducted for a particular QPWS managed area through WildNet.</p>
<p>7. Integrate the special requirements of wetlands when developing management plans, methods for undertaking onground management and other management related documents/tools.</p>	<p>Of all ecosystems, wetlands are considered to be one of the most biologically diverse and therefore difficult to effectively manage, particularly when one or more terrestrial ecosystems are also being managed at the same time.</p> <ul style="list-style-type: none"> • Utilise existing park planning and management processes but ensure that an initial desk-top wetland mapping exercise has been conducted using up-to-date information early in the process (see Principle 1 and associated guidelines). • Ensure management-related documents and programs (e.g. park management plans and statements (and their associated actions), fire and pest management strategies, Park Folios, Management Effectiveness Evaluation (MEE) * and monitoring programs) take into account the conservation significance and special requirements for wetland management in relation to wildlife, vegetation, fire, pest and water quality management — as this may differ from terrestrial management. For example, fire and pest management activities should not have unacceptable impacts on water quality or threaten the survival of wetland-dependent flora and fauna. • When developing management plans, other management related documents or programs, the actions should ensure the protection of significant Wetland Environmental Values (WEVs), Ramsar and other important wetland sites, and migratory bird species listed under international treaties (see Principles 3 and 6 and associated guidelines). • Park Folios and MEE programs developed for QPWS managed areas containing Ramsar wetlands should consider and wherever possible provide consistency with Ramsar management and monitoring requirements, and the Ecological Character Descriptions (ECDs) for these sites (see Principle 6 and associated guidelines). • Given the susceptibility of wetlands to climatic conditions onground park management should also consider how wetlands and hydrology on the site could be impacted by altered conditions over time; and in-turn the potential impacts on wetland dependent flora and fauna, pest species and fire intensities.
<p>8. Base the management and use of wetlands within QPWS managed areas on ecologically sustainable management and integrated catchment management practices.</p>	<ul style="list-style-type: none"> • Park management should consider catchment-scale impacts, resulting from adjacent land and water uses, to ensure Wetland Environmental Values (WEVs) both on and in proximity to protected areas are appropriately protected. This is particularly important for Ramsar and other conservation significant wetlands, such as those that serve a major hydrological or ecological connectivity function in the landscape. • Relevant stakeholders should be consulted during the development of management plans (see Principle 6) for areas containing wetlands. This is particularly important for Ramsar and Directory of Important Wetland (DIWA) sites, or wetlands that serve a major hydrological or ecological connectivity function in the landscape. • An easy way to find out about the catchment associated with a QPWS managed area is through the wetland summary information tool on <i>WetlandInfo</i> (http://www.epa.qld.gov.au/wetlandinfo/site/MappingFandD/WetlandMapsAndData/SummaryInfo.jsp); or via <i>WetlandMaps</i> within the <i>WetlandInfo</i> website (see Principle 1 and 4, and associated guideline information). The summary information tool provides information about QPWS managed areas, wetlands of conservation

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	<p>significance, Water Resource Planning Areas and other information associated with a particular catchment.</p> <ul style="list-style-type: none"> The relative wetland conservation values for wetlands within a catchment are provided through the Aquatic Conservation Assessments (ACAs), using the Aquatic Biodiversity Assessment and Mapping Methodology (AquaBAMM) developed by EHP. This is available as a layer on EcoMaps or directly from the Biodiversity Assessment Team within EHP. Specific actions related to community engagement in relation to wetlands and adjacent land uses may be required to protect wetland values on QPWS managed areas. Relationships with adjacent landholders should be developed according to the QPWS good neighbour operational policy, particularly in relation to fire management, pest management, domestic animals, stock management and fencing, which can all have significant impacts on surrounding wetlands.
<p>9. Implement onground management that recognises and restores, maintains or enhances wetland environmental values (WEVs).</p>	<ul style="list-style-type: none"> Onground management must reflect the objectives and actions outlined in a management plan (where available) for the protection of wetland environmental values (WEVs). Monitoring and reporting on the wetlands ecological character should be conducted and recorded in Park Folios, or other systems/procedures developed as part of the MEE program. This information should then be used when reviewing management plans and onground management of the QPWS managed area. This is essential for areas that contain Ramsar sites; and highly recommended for conservation significant wetlands, particularly those with a major hydrological or ecological connectivity function in the landscape.
<p>10. Ensure management of tourism or recreational activities in or in proximity to wetlands does not detract from other wetland values, or inappropriately disturb wetland-dependant wildlife.</p>	<ul style="list-style-type: none"> When developing strategies and actions relating to tourism and visitor use and management a clear understanding of wetland environmental values and threats should be known. This must be reflected in the designation of management zones and the visitor capacity allowed in the wetland and its surrounds. Where there are sensitive or threatened wetland values at Ramsar sites or other conservation significant wetlands (e.g. disturbance of migratory birds) the management zone status should be based on the conservation of natural values.
<p>11. Develop community and landholder awareness of, and respect for, the values and benefits of wetlands; and involve them in their management.</p>	<ul style="list-style-type: none"> Ensure relevant wetland stakeholders are consulted during the development of management plans for areas containing wetlands (see Principle 6). This is particularly important for Ramsar and DIWA sites, or wetlands with a major hydrological or ecological connectivity function in the landscape. Wetlands, particularly Ramsar and DIWA, should be considered when developing interpretive information for an area, as well as any interpretation section of a management plan. Interpretive information (including information available on the Department of National Parks, Recreation, Sport and Racing (NPRSR) website, on signs or in brochures) and actions within management plans should enhance tourism and visitor experiences, knowledge and appreciation of the wetland. Management plans should support opportunities to develop partnerships with organisations and that will foster education and research into wetlands.
<p>12. Consider the establishment and operation of strategically located wetlands interpretation and education centres.</p>	<p>Interpretation material (including information available on the NPRSR website, on signs or in brochures) for QPWS managed areas containing Ramsar or significant wetlands should highlight the significance, value and benefits of the wetland to enhance tourism and visitor experiences, knowledge and appreciation of the site.</p>

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* Glossary of terms

Conservation status and/or conservation significance: In this document the term conservation status is used to mean wetlands identified as being of significance either through Australian (e.g. Ramsar) or Queensland legislation (e.g. *Vegetation Management Act 1999*). The term conservation significance is used more broadly to mean wetlands considered as important from a biodiversity perspective, and identified through Queensland government policies, tools and methodologies (e.g. regional ecosystem mapping, Biodiversity Planning Assessments (BPA), Aquatic Conservation Assessments (ACA), Areas of Ecological Significance (AES), and wetland mapping). It is also used to describe wetlands that may provide habitat for wildlife recognised as threatened under Australian and Queensland legislation, and wetlands that provide ecological and hydrological connectivity.

Note: *In relation to Queensland's biodiversity interests for land-use planning purposes and identified through AES mapping, all National Parks, Conservation Parks, Resources and Forest Reserves are considered as areas of high ecological significance (HES), therefore all wetlands on these estates are also considered of high ecological significance* (<http://www.ehp.qld.gov.au/land/natural-resource/pdf/aes-methodology.pdf>).

Ecological character: the combination of ecosystem components, processes, benefits, and services that characterise the wetland.

Other lands: refers to marine parks, recreation areas, forest reserves, State forests and other reserves.

Management Effectiveness Evaluation (MEE): refers to a program being developed by QPWS that utilises Park folios, categories, the Rapid Assessment Program (RAP) and other methods to provide a clear link between management planning, onground park management; and monitoring to assist in evaluating onground management actions.

Protected areas: in this instance refers to the classes of protected areas defined under the *Nature Conservation Act 1992* which are managed by QPWS — this includes national parks, conservation parks and resources reserves.

Queensland Wetlands Program (QWP): The program was established in 2003 as a joint initiative of the Australian and Queensland Governments. The overarching aim of the program is to support projects and activities that result in long-term benefits to the sustainable management, wise use and protection of wetlands in Queensland.

Ramsar wise-use principles: The Ramsar convention defines the wise use of wetlands as "*the maintenance of their ecological character, achieved through the implementation of ecosystem approaches, within the context of sustainable development*" (http://www.ramsar.org/cda/en/ramsar-about-faqs-what-is-wise-use/main/ramsar/1-36-37^7724_4000_0). A handbook describing concepts and approaches to "wise-use" can be found on the Ramsar website (http://www.ramsar.org/pdf/lib/lib_handbooks2006_e01.pdf).

Shorebirds (or waders): a general term describing migratory and non-migratory (resident) birds commonly associated with coastal areas (beaches, rocky shores, mudflats, tidal wetlands), from the following families: Scolopacidae, Burhinidae, Haematopodidae, Recurvirostridae, Charadriidae, Glareolidae. Shorebirds or may also be found in open fields near water sources, or inland wetlands; and feed by wading in shallow waters or at waterlines.

Waterbirds: a large and varied group of birds that are ecologically tied to bodies of water for some portion of their lifecycle. Waterbirds may be migratory or non-migratory (resident). They come from the six major orders: Anseriformes, Podicipediformes, Pelecaniformes, Ciconiiformes, Gruiformes, and Charadriiformes.

WetlandInfo: This is the website associated with the QWP that provides a "*first-stop-shop*" for a variety of information and tools to assist wetland managers or anyone with an interest in wetlands (<http://www.epa.qld.gov.au/wetlandinfo/site/>).

The information and tools available include: mapping applications (either interactive or static); report tools; definitions and classifications for wetlands; environmental values associated with wetlands (known as Wetland Environmental Values (WEVs)); Wetland Indicator Species (WIS) — flora and fauna lists associated with a

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wetland; an information capture system for users (known as Wetland Information Capture (WIC)); wetland management profiles; conceptual models; stressor/threat models; planning and legislation toolbox; nationally and internationally important wetlands information (i.e. for Ramsar and the Australian Directory of Important Wetlands); and other sources of information.

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Disclaimer

While this document has been prepared with care, it contains general information and does not profess to offer legal, professional or commercial advice. The Queensland Government accepts no liability for any external decisions or actions taken on the basis of this document. Persons external to the Department of National Parks, Recreation, Sport and Racing should satisfy themselves independently and by consulting their own professional advisors before embarking on any proposed course of action.

Approved By

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Signature

4/6/2013

Date

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Appendix 2 - Endangered and of concern regional ecosystems associated with wetlands on Currawinya National Park

Regional ecosystem (RE) number	Description	Biodiversity status*	Wetland type associated with RE**
6.3.1	<i>Eucalyptus camaldulensis</i> woodland	Of concern	Riverine wetland or fringing riverine wetland
6.3.3	<i>E. camaldulensis</i> +- <i>E. coolabah</i> +- <i>E. populnea</i> +- <i>Acacia stenophylla</i> woodland	Of concern	
6.3.8	<i>E. largiflorens</i> +- <i>A. cambagei</i> woodland	Of concern	Palustrine wetland (e.g. vegetated swamp).
6.3.10	<i>Halosarcia spp.</i> open succulent shrubland on alluvium	Of concern	
6.3.11	<i>Eleocharis pallens</i> +- short grasses +- <i>Eragrostis australasica</i> open forb land.	Of concern	
6.3.23	Springs on recent alluvia, ancient alluvia and fine-grained sedimentary rock	Endangered	

* The Biodiversity Status: used by the Queensland Government for a range of planning and management applications (including protected area management planning) — it is based on an assessment of the condition of remnant vegetation and associated threats.

** Wetland type: the wetland type (descriptor) associated with an individual RE.