

### Value: Wetland Ecosystem

The value of the environmental processes, organisms, habitat and conditions of wetland ecosystems that provide indirect human benefits by supporting other environmental values. This value asserts a holistic; systems based approach to managing wetlands.

| Category                 | Characteristics or Qualities        |   |
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| <b>Wetland Processes</b> | Hydrological processes              | Cyclic movement of water through the surface, sub-surface, atmospheric compartments associated with a wetland, and the resultant variation of the spatial and temporal distribution of the water and its properties and characteristics. Variation in a wetland's hydrological processes can affect many ecological aspects of the wetland itself, and also influence aspects of global, aquifer and catchment scale hydrological cycles; for example, a wetland may allow localised groundwater recharge, and evaporation that increases the amount of atmospheric moisture.   |
|                          | Food webs                           | Network of living things in a wetland that depend on each other for food; involving a complex network of interactions and trophic pathways that transfer energy and nutrients from one species to another.  |
|                          | Physical habitat                    | Physical features (biotic and abiotic) of a wetland that are important for providing important habitat for part or parts of the life cycle of wetland organisms, e.g. for migration, feeding, breeding, hibernation – for example, fish species such as the barramundi spend approximately one year of its juvenile life cycle in fresh and brackish wetlands, and also for maintaining wetland processes – for example, physical features such as Riparian areas are necessary for proper function of riverine Ecosystems because they provide habitat for aquatic macroinvertebrates, and their ability to trap sediment, shade any water bodies, and reduce erosion; Wader feeding sites often have specific physical habitat characteristics. |
|                          | Nutrient cycling                    | Cycling (uptake, transformation, movement and re-uptake) of minerals, compounds, or elements that promote biological growth or development in a wetland ecosystem, including repeated pathways of particular nutrients or elements from the environment through one or more organisms back to the environment; includes primary production and the carbon, nitrogen and phosphorus cycles.  |
|                          | Sediment trapping and Stabilisation | Related processes of trapping, and stabilisation of sediment, that occur as a function of the physical features of a wetland and its biotic communities. These processes can respectively affect the rate and temporal aspects of sediment movement to downstream areas and reduce the likelihood of erosion in and around a wetland.   |
|                          | <b>Conservation Significance</b>    | Diversity   |
| Naturalness              |                                     | Lack of human induced disturbance, incorporating consideration of the ecological integrity (the capacity of the wetland ecosystem to sustain itself and remain robust to natural forms of disturbance). Wetlands that have been disturbed by humans often have lower ecological integrity than natural wetlands.  |
| Special Features         |                                     | Presence of features that are generally uncommon in the landscape arising from a combination of features such as uncommon species, habitat, geomorphic features or ecological functions (e.g. acting as   |

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|  |  | drought refuge, supporting species at a vulnerable or particular stage of their life cycle, supporting high productivity).   |
|  | Distinct or Unique species   | Presence of species which are not uncommon but are otherwise of importance, such as keystone or indicator species, also including species which might be termed iconic species, that is, those species which are especially important to the community often in a symbolic sense or by association such as platypus, broilgas, freshwater cod, barramundi.   |
|  | Representativeness and/or Unique Habitat   | Typicalness of a wetland's characteristics usually relating to a type or class of wetlands. Representativeness generally arises from a combination of geomorphic, ecological and hydrological features, but occasionally representative individual features may be of high value (such as particular fish communities). Representative examples may or may not be common, so some examples may also have rarity value. A good representative example is likely to be in natural condition or unique in terms of providing habitat for a certain species.                           |
|  | Threatened Species and Ecosystems, including Habitats  | Presence of Threatened Species, ecosystems or habitats in association with a wetland, e.g. presence of a rare or threatened (important) wetland type; supporting rare species or taxa or endangered/ vulnerable wildlife, or endangered/ of-concern habitats such as Endangered Regional Ecosystems.   |
|  | Priority Species and Ecosystems  | Presence of wetland species, ecosystems, habitat, or processes that have been identified for special protection, for example protected areas, protected areas (State Land) or protected wildlife, or presence of species subject to a recovery or management plan, or sites under Ramsar, JAMBA or CAMBA.  |
|  | Ecological Connectivity  | Role in supporting another wetland or wetland aggregation, terrestrial ecosystem, or species transfer/movement; for example, a wetland could support another wetland's hydrological processes and provide a pathway for seed dispersal.  |
| <b>Material Benefits from Wetland Ecosystems</b> | Mitigation of impacts of climate change  | Role in mitigating the enhanced greenhouse effect and the impacts of climate change, for example, by sequestering and storing carbon dioxide from the air, or providing a habitat/refuge for animals during extreme weather events (e.g. drought) associated with climate change.  |
|  | Coastal shoreline and bank stabilization and storm protection                                  | Role in reducing coastal hazards and maintaining coastal processes, due to the physical structures provided by wetland and its biota – for example, stabilisation of the substrate and provision of shelter from the impacts of wind, wave action and currents.  |
|  | Local climate regulation   | Influence on local climatic affects, for example, through evaporation of water that can help to form mist, fog and rain and provide a local cooling effect.  |
|  | Biological control of pest species and diseases and support of predators of agricultural pests | Provision of habitat for animals that can control pests and diseases. For example some frogs and fish that live in wetlands reduce the abundance of disease vectors by eating mosquitoes or their larvae. Some wetlands provide habitat for predators that control agricultural pests; for example, ibis feeding on grasshoppers.  |
|  | Trapping, storage and/or treatment of contaminants   | Role of a wetland in slowing flow, trapping and assimilating sediments, nutrients and other contaminants; and thereby "buffering" the amount of contaminant transfer that may occur during flow events. Contaminants may arise from natural or anthropogenic (related to human activities) sources. "Contaminants" from anthropogenic sources include point and diffuse sources; such as stormwater runoff from urban or agricultural land, irrigation areas, degraded landscapes or urban stormwater management systems, and discharges from sewage treatment plants or industry. |
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|  | Flood control   | Role in reducing flood water impacts, for example, reducing peak levels and velocity.   |
|  | Primary production  | Provision of suitable location and resources (e.g. aquatic habitat, nutrient sources) for primary production, such as aquaculture, grazing, and fisheries production.   |
|  | Genetic resources   | Role in preserving a natural reservoir for biological diversity, providing genetic resources that, for example support colonisation, contribute to maintaining intra-species diversity, and allow for research and development such as selective breeding and the development of new medicines.   |
| <b>Material Products Obtained Directly from Wetlands</b> | Water supply  | Provision of sufficient and suitable water.   |
|  | Drinking water  | Suitable raw drinking water supply. This assumes minimal treatment of water is required – for example, coarse screening and/or disinfection.  |
|  | Farm Water Supply   | Suitable domestic farm water supply other than drinking water – for example, water quality and quantity suitable for use for laundry and produce preparation.   |
|  | Irrigation  | Suitable water supply for irrigation, for example, irrigation of crops, pastures, parks, gardens and recreational areas.  |
|  | Stock watering  | Suitable water supply and quantity for production of healthy livestock.   |
|  | Industrial Uses   | Suitable water supply for industrial use – for example, food, beverage, paper, mining and power industries. Industries usually treat water supplies to meet their needs.  |
|  | Aquaculture   | Suitable water supply for the health of aquaculture species and humans consuming cultured foods (such as fish, molluscs and crustaceans).   |
|  | Human consumers of aquatic Foods  | Suitability of a wetland to ensure the health of humans consuming aquatic foods – such as fish, crustaceans and shellfish.  |
|  | Wetland products, such as animal and plant material   | Provision of populations and species of flora and fauna and other resources that can be used by humans either directly or indirectly (wetland products). Wetland areas may provide, for example, fisheries production, brood stock for aquaculture, aquaculture products (e.g. fish), a source of salt, or stock fodder (e.g. grazing).   |
| <b>Activities</b>  | Recreation  | Provision of areas for people to undertake recreational and nature-based activities, which may include contact with water; for example primary recreation (involving indirect contact and a low probability of water being swallowed – for example, wading, boating, rowing, and fishing) or secondary recreation that doesn't involve physical contact with water – e.g. walking and picnicking adjacent to a wetland, and observing nature, such as bird watching). |
|  | Tourism   | Provision of areas for people to undertake activities associated with tourism – for example, ecotourism, and tourists using the wetland for activities such as fishing or tours.  |
|  | Education   | Provision of areas for people to undertake activities associated with education – for example, learning about nature and/or conducting research.  |
| <b>Cultural Resources</b>                                | Note the Cultural Resources Wetland Environmental Value is being developed cultural resources are places or objects that have anthropological, archaeological, historical, scientific, spiritual, visual or sociological significance or value, including such significance or value under Aboriginal tradition or Torres Strait Island custom, within the coastal zone (schedule of the Coastal Protection and Management Act 1995). |   |