Freshwater Wetlands on Coastal Floodplains (Freshwater Wetlands)

Introduction

These guidelines provide background information to assist land managers and approval authorities to identify remnants of Freshwater Wetlands on Coastal Floodplains (hereafter referred to as Freshwater Wetlands), an Endangered Ecological Community (EEC). For more detailed information refer to the Freshwater Wetlands Profile and the NSW Scientific Committee Final Determination at: threatenedspecies.environment.nsw.gov.au

What is an Endangered Ecological Community?

An ecological community is an assemblage of species which can include flora, fauna and other living organisms that occur together in a particular area. They are generally recognised by the trees, shrubs and groundcover plants that live there. An Endangered Ecological Community is an ecological community listed as facing a very high risk of extinction in NSW under the *Threatened Species Conservation Act* 1995.

What are Freshwater Wetlands?

Freshwater Wetlands is an ecological community associated with periodic, semi-permanent or permanent inundation by freshwater, although there may be minor saline influence in some wetlands. Meadows of grasses, sedges and rushes

What is the Coastal Floodplain?

Floodplains are level landform patterns on which there may be active erosion and deposition by flooding where the average interval is 100 years or less.

Coastal floodplains include coastal river valleys, alluvial flats and drainage lines below the escarpment of the Great Dividing Range. While most floodplains are below 20m in elevation, some may occur on localised river flats up to 250m elevation. However, there may be local variation associated with river channels, local depressions, natural levees and river terraces. The latter are areas that rarely flood anymore due to the deepening or widening of streams.

occur where submersion is not prolonged, while aquatic herbs dominate where semi-permanent or permanent standing water is present. Under the influence of saline water tall reeds and rushes dominate. The boundaries of Freshwater Wetlands are dynamic, and vary greatly depending on rain and other climatic factors. A remnant may be considered part of the EEC even when the site is completely dry (see photos).

The final determination of the NSW Scientific Committee for Freshwater Wetlands does not delineate between higher and lower quality remnants of this community. It specifically notes that the composition and structure of the vegetation found is influenced by grazing history, changes to drainage regime and soil

The variation in species composition and vegetation structure between seasons can be seen clearly below.



Photographs: Jocelyn Howell





salinity, catchment runoff

Whilst artificial wetlands created on previously dry land for purposes such as sewerage treatment, stormwater management and farm production, are not regarded as part of this community, they may still provide important habitat for threatened species.



Where are Freshwater Wetlands found?



Freshwater Wetlands typically occur on silts, muds or humic loam soils in depressions, flats, drainage lines, backswamps, lagoons and lakes associated with the Coastal Floodplain (see page 1) and are not influenced by tidal exchange. The community is usually found below 20m in elevation in the NSW North Coast, Sydney Basin and South East Corner bioregions as mapped above.

Description of the community The Tree and Shrub layer

Freshwater Wetlands typically have a scarcity to complete absence of woody species, but as they co-exist with other forested vegetation types (e.g. Swamp Oak Floodplain Forest), there may be scattered occurrences of *Casuarina* or *Melaleuca* species found within them, particularly around wetland edges and in transition areas between these communities.

The Reed layer

The community will often consist of large patches of Broad-leaved Cumbungi (*Typha* species) or Common Reed (*Phragmites australis*). These reeds will often exceed 2m in height and can form large monocultures.

The Ground layer - Terrestrial and Aquatic Herbs

The structure and composition of the community varies throughout the year both in space and time depending on the water regime. The structure of the community may vary between years as well as between seasons (see photos).

Wetlands or parts of wetlands that lack standing water most of the time are usually dominated by dense grassland, sedgeland or rushland vegetation, often forming a turf less than 0.5m tall and dominated by amphibious plants including Water Couch (*Paspalum distichum*), Swamp Rice-grass (*Leersia hexandra*), Spiny Mud Grass (*Pseudoraphis spinescens*) and Tall Sedge (*Carex appressa*).

Wetlands or parts of wetlands subject to regular inundation and drying may include large emergent sedges / rushes over 1m tall, such as Jointed Twig-rush (Baumea articulata), Spike sedges (Eleocharis species), Juncus usitatus, Persicaria species, Bolboscheonus species and Schoenoplectus species and Lepironia (Lepironia articulata), as well as emergent or floating herbs such as Frogbit (Hydrocharis dubia), Frogsmouth (Philydrum lanuginosum), Water Primrose (Ludwigia peploides subsp. montevidensis), Nardoo (Marsilea mutica) and Water Milfoils (Myriophyllum species).

As standing water becomes deeper or more permanent, amphibious and emergent plants become less abundant, while floating and submerged aquatic herbs become more abundant. These latter species include Azolla (Azolla species), Hornwort (Ceratophyllum demersum), Water Thyme (Hydrilla verticillata), Duckweeds (Lemna species), Water Snowflake (Nymphoides indica), Swamp Lily (Ottelia ovalifolia) and Pondweeds (Potamogeton species) and in the north of NSW, Giant Waterlily (Nymphaea gigantea).

EECs that may adjoin or intergrade with Freshwater Wetlands

This community occurs with, would have previously occurred with or closely resembles other coastal floodplain ecological communities which are now also listed as EECs. Collectively, these EECs cover all remaining native vegetation on the coastal floodplains of NSW. These EECs are:

- 1. Swamp Oak Floodplain Forest, Coastal Saltmarsh or Swamp Sclerophyll Forest on Coastal Floodplains where there is increasing estuarine influence;
- River-Flat Eucalypt Forest on Coastal Floodplains and Sub-tropical Coastal Floodplain Forest (north of Port Stephens) where soils become less waterlogged;
- 3. Lowland Rainforest on Floodplain in the NSW North Coast bioregion;
- 4. Sydney Freshwater Wetlands: this community may include a component of woody plant species and is associated with sandplains in the Sydney Basin bioregion. It is distinct from Freshwater Wetlands on Coastal Floodplains.

Collectively, these communities encompass the full range of intermediate native vegetation assemblages on the Coastal Floodplain.

How can I identify areas of Freshwater Wetlands

The following are 'Key Indicators' to look for when identifying Freshwater Wetlands:

- 1. Is the site on the coastal floodplain of the NSW North Coast, Sydney Basin or South East Corner bioregion (see map and box)?
- 2. Is the site periodically inundated with or does it maintain a body of semi-permanent or permanent freshwater?
- 3. Does the site consist of relatively few woody plants?
- 4. Are more than a few of the species present at the site listed as characteristic of Freshwater Wetlands in the table (check with local botanist, consult reference books or see <u>plantnet.rbgsyd.nsw.gov.au</u>)?

If you answered yes to the above questions your site is likely to consist of Freshwater Wetlands and you should seek expert advice.

Characteristic Species List

Freshwater Wetlands are characterised by the species listed in table below. They have been identified by the NSW Scientific Committee and from the scientific literature. The species present at any site will be influenced by the size of the site, recent rainfall or drought conditions and by its disturbance (including grazing and drainage changes) history. Note that NOT ALL the species listed below need to be present at any one site for it to constitute Freshwater Wetlands.

Scientific Name	Common Name (range)
Grasses	
Hemarthria uncinata	Matgrass
Leersia hexandra	Swamp Ricegrass (N - Syd)
Panicum obseptum	White Water Panic
Paspalum vaginatum	Saltwater Couch
Paspalum distichum	Water Couch
Pseudoraphis spinescens	Spiny Mud-grass
Herbs	
Centipeda minima	Spreading Sneezeweed
Eclipta platyglossa	Yellow Twin-heads
Eclipta prostrata	White Eclipta
Gratiola pedunculata	Stalked Brooklime
Ludwigia peploides subsp.	Water Primrose
montevidensis	
Maundia triglochinoides (T)	Small Water-ribbons (N-Syd)
Myriophyllum crispatum	Upright Water-milfoil
Myriophyllum latifolium	Water-milfoil
Myriophyllum variifolium	Variable Water-milfoil
Nymphoides geminata	Entire Marshwort (N - Syd)
Nymphoides indica	Water Snowflake (N - Syd)
Persicaria attenuata	Smartweed
Persicaria decipiens	Slender Knotweed
Persicaria hydropiper	Water Pepper
Persicaria lapathifolia	Pale Knotweed
Persicaria strigosa	Prickly Smartweed
Ranunculus inundatus	River Buttercup
Utricularia australis	Floating Bladderwort
Reeds	
Phragmites australis	Common Reed
Typha orientalis	Broad-leaved Cumbungi
Sedges & Rushes	
Baumea articulata	Jointed Twig-rush
Baumea rubiginosa	Twig-rush
Bolboschoenus caldwellii	Club-rush
Bolboschoenus fluviatilis	Marsh Club-rush
Carex appressa	Tall Sedge
Cyperus lucidus	Leafy Flat Sedge
Eleocharis acuta	Common Spike Sedge
Eleocharis equisetina	A Spike Sedge (N - B-Bay)
Eleocharis minuta	A Spike Sedge (N - J-Bay)

N = North of; B-Bay = Batemans Bay; Clar = Clarence River; Coffs = Coffs Harbour; J-Bay = Jervis Bay; Pict = Picton; Syd = Sydney; W'Gong = Wollongong; (T) = threatened species. For further help with identification see: plantNET.rbgsyd.nsw.gov.au/search/simple.htm

Scientific Name	Common Name (range)
Fimbristylis dichotoma	Common Fringe-sedge
Juncus polyanthemos	A Sharp Rush (N -
	W'Gong)
Juncus usitatus	Common Rush
Lepironia articulata	Lepironia (N - Pict)
Schoenoplectus subulatus	Shore Club-sedge
(formerly Scirpus litoralis)	
Schoenoplectus mucronatus	A Club Sedge (N - Syd)
Schoenoplectus validus	River Club-sedge
Aquatic Herbs	
Alisma plantago-aquatica	Water Plantain
Azolla filiculoides var. rubra	Red Azolla
Azolla pinnata	Azolla
Brasenia schreberi	Watershield
Ceratophyllum demersum	Hornwort
Hydrilla verticillata	Water-thyme
Hydrocharis dubia	Frogbit (N - Clar)
Lemna spp (L. disperma &	Duckweed
L. trisulca).	
Marsilea mutica	Nardoo
Najas marina	Prickly Waternymph
Najas tenuifolia	Waternymph
Nymphaea gigantea	Giant Waterlily (N - Coffs)
Ottelia ovalifolia	Swamp Lily
Philydrum lanuginosum	Woolly Waterlily
Potamogeton crispus	Curly Pondweed
Potamogeton ochreatus	Blunt Pondweed
Potamogeton perfoliatus	Clasped Pondweed
Potamogeton tricarinatus	Floating Pondweed
Spirodela spp. (S. polyrhiza	Thin Duckweed
& S. piunctata)	
Triglochin procera	Water Ribbons
Vallisneria gigantea	Ribbonweed
Wolffia spp.	Wolffia





Azolla & Slender Knotweed herb, species in Freshwater Wetlands. Photo: Lucas McKinnon



The transition from Freshwater Wetlands to Swamp Oak Floodplain Forest and Swamp Sclerophyll Forest can be seen here. Photo: Lucas McKinnon



Freshwater Wetland overrun by the weed species,Water Hyacinth (Eichhornia crassipes). Photo: Lucas McKinnon



Freshwater Wetlands in a cleared lanscape near Grafton important conservation significance. Photo: Hugh Robertson



Freshwater Wetlands provide important feeding and breeding habitat for migratory birds like the Cattle Egret and Australian White Ibis as seen here. Photo: Suzette Rodoreda

Degraded sites conservation significance of remnants

The degree of disturbance (i.e. the site condition) of any remnant of Freshwater Wetlands may vary depending on past land use, management practices and/or natural disturbance and this should be considered at the time of assessment. Whilst not exhaustive, the following are a number of variations of Freshwater Wetlands you may encounter on your land:

- Damp depressions no longer subject to regular flooding due to changed drainage regimes such as upstream dams or drawdown from irrigation;
- 2. Damp depressions with low grass structure due to grazing or slashing (wetland species will often recover if this disturbance is removed);
- Water bodies invaded with floating weeds such as Water Hyacinth (Eichhornia crassibes);
- 4. Vegetated waterbodies enclosed by artificial earthwalls for water storage;
- Dry cracked soil with low grass type species emerging (i.e. during drought or drying phase);
- 6. Large monocultures of reed species such as Common Reed and/or Cumbungi.

Even where a remnant is considered to be heavily degraded and in poor condition, it may still have conservation value for a number of reasons including:

- 1. As part of a stream/wetland corridor that has connective importance for dispersal of native flora and aquatic organisms;
- Providing important habitat and food source for freshwater fish and amphibian species;
- 3. Providing a water and food source for native mammal and bird species;
- It may contain threatened species of flora such as Aldrovanda vesiculosa, Maundia triglochinoides and Persicaria elatior; and/or
- 5. Maintaining a healthy native seed bank and preserving local provenance (i.e. genetic integrity).

It is important to take these factors into account when determining the conservation significance of remnants.

For further assistance

This and other EEC guidelines are available on DECC Threatened Species website threatenedspecies.environment.nsw.gov.au/

The references listed below also provide further information to aid in identifying EECs.

- Aston, H.I. (1977) Aquatic Plants of Australia: A Guide to the Identification of the Aquatic Ferns and Flowering Plants of Australia, both Native and Naturalised. Melbourne University Press.
- Botanic Gardens Trust plant identification assistance: <u>rbgsyd.nsw.gov.</u> <u>au/information_about_plants/botanical_</u> info/plant_identification
- Botanic Gardens Trust PlantNET: <u>plantnet.rbgsyd.nsw.gov.au/search/simple.</u> <u>htm</u>
- Freshwater Wetlands on Coastal Floodplains species profile: <u>threatenedspecies.environment.nsw.gov.</u> <u>au/tsprofile/profile.aspx?id=10929</u>
- Harden, G. (ed) *Flora of NSW Vols* 1 4 (1990-2002). NSW University Press.
- Keith, D.A. and Scott, J. (2005) Native vegetation of coastal floodplains - a diagnosis of the major plant communities in New South Wales. Pacific Conservation Biology, 11(2): 81-104.
- NSW Scientific Committee
 Determinations: <u>environment.nsw.gov.</u>
 <u>au/committee/FinalDeterminations.htm</u>
- Robinson, L (2003) Field guide to native plants of Sydney revised 3rd edition. Kangaroo Press.
- Sainty, G. R. and Jacobs, S. W. (2003) Australian Waterplants – A Field Guide. CSIRO Publishing, Australia.
- Stephens, K. M. and Dowling, R. M. (2002) Wetland Plants of Queensland: A Field Guide. CSIRO Publishing, Collingwood, Victoria.
- Thackway, R, and Cresswell, I. (1995) (eds) 'An interim biogeogeographic regionalisation of Australia: a framework for establishing the national system of reserves.' (Australian Nature Conservation Agency: Canberra).

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