

Information Sheet on Ramsar Wetlands (RIS)

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

This Ramsar Information Sheet has been converted to meet the 2009 – 2012 format, but the RIS content has not been updated in this conversion. The new format seeks some additional information which could not yet be included. This information will be added when future updates of this Ramsar Information Sheet are completed. Until then, notes on any changes in the ecological character of the Ramsar site may be obtained from the Ecological Character Description (if completed) and other relevant sources.

1. Name and address of the compiler of this form:

This form was prepared jointly by:

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

26th March, 1999

3. Country:

Australia

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Gwydir Wetlands: Gingham and Lower Gwydir (Big Leather) watercourses.

5. Designation of new Ramsar site or update of existing site:

Gwydir Wetlands was designated on 14 June 1999

This RIS is for (tick one box only):

a) Designation of a new Ramsar site ☒; or

b) Updated information on an existing Ramsar site ☐

6. For RIS updates only, changes to the site since its designation or earlier update:

a) Site boundary and area

The Ramsar site boundary and site area are unchanged: ☐

or

If the site boundary has changed:

- i) the boundary has been delineated more accurately ☐; or
- ii) the boundary has been extended ☐; or
- iii) the boundary has been restricted** ☐

and/or

If the site area has changed:

- i) the area has been measured more accurately ☐; or
- ii) the area has been extended ☐; or
- iii) the area has been reduced** ☐

**** Important note:** If the boundary and/or area of the designated site is being restricted/reduced, the Contracting Party should have followed the procedures established by the Conference of the Parties in the Annex to COP9 Resolution IX.6 and provided a report in line with paragraph 28 of that Annex, prior to the submission of an updated RIS.

b) Describe briefly any major changes to the ecological character of the Ramsar site, including in the application of the Criteria, since the previous RIS for the site:

7. Map of site:

Refer to Annex III of the *Explanatory Note and Guidelines*, for detailed guidance on provision of suitable maps, including digital maps.

a) A map of the site, with clearly delineated boundaries, is included as:

- i) a hard copy (required for inclusion of site in the Ramsar List): ☐;
- ii) an electronic format (e.g. a JPEG or ArcView image) ☒;
- iii) a GIS file providing geo-referenced site boundary vectors and attribute tables ☐.

b) Describe briefly the type of boundary delineation applied:

e.g. the boundary is the same as an existing protected area (nature reserve, national park, etc.), or follows a catchment boundary, or follows a geopolitical boundary such as a local government jurisdiction, follows physical boundaries such as roads, follows the shoreline of a waterbody, etc.

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Provide the coordinates of the approximate centre of the site and/or the limits of the site. If the site is composed of more than one separate area, provide coordinates for each of these areas.

Windella: Latitude: 29°12'10"; Longitude: 149° 05'40"

Crinolyn: Latitude: 29° 13'20"; Longitude: 149° 07'20"

Old Dromana: Latitude: 29° 21'00"; Longitude: 149° 19'50"

Goddard's Lease: Latitude: 29° 25'00"; Longitude: 149° 23'10"

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

The Gwydir wetlands are approximately 60km west of Moree in the north west of New South Wales, Australia. The Ramsar sites occur within the larger Gwydir wetland system.

10. Elevation: (in metres: average and/or maximum & minimum)
160 metres above sea level.

11. Area: (in hectares)
Area of nominated wetlands: 823 hectares
Total area of wetland system: 102,120 hectares.

12. General overview of the site:

Provide a short paragraph giving a summary description of the principal ecological characteristics and importance of the wetland.

The Gwydir Wetlands are one of the few terminal wetlands found within inland NSW and contain one of the largest stands of water couch (*Paspalum distichum*) and marsh club-rush (*Bolboschoenus fluviatilis*) remaining in New South Wales (Bennett and Green, 1991) (McCosker and Duggin, 1993). The wetlands provide breeding and feeding grounds for very large numbers of colonial water bird species (around 500,000 in 1998), habitat for many threatened species and also continues to support a viable grazing industry.

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 •	2 •	3 •	4 •	5 •	6 •	7	8 •	9
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14. Justification for the application of each Criterion listed in 13 above:

Provide justification for each Criterion in turn, clearly identifying to which Criterion the justification applies (see Annex II for guidance on acceptable forms of justification).

Criterion 1: A wetland should be considered internationally important if it contains a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region.

[Justification against former **Criteria 1(a), 1(b), 1(c) and 1(d)** under the Pre-1999 Criteria]:

Although parts of the wetland have been substantially modified due to river regulation, the Gwydir Wetlands remain a particularly good example of an inland terminal delta in the both the Darling Riverine Plains bioregion and the whole of the Murray-Darling Basin. It plays a substantial part in the biological and ecological functioning of the Murray-Darling Basin, as the major wetlands in the Basin are rarely inundated simultaneously, and therefore not always suitable for bird breeding at the same time. The Ramsar listed areas are important components of the entire Gwydir wetland system.

Criterion 2: A wetland should be considered internationally important if it supports vulnerable, endangered, or critically endangered species or threatened ecological communities.

[Justification against former **Criterion 2(a)** under the Pre-1999 Criteria]:

The wetland supports an appreciable assemblage of rare, endangered and vulnerable species, including magpie geese (breeding), and brolga.

Criterion 3: A wetland should be considered internationally important if it supports populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region.

[Justification against former **Criterion 2(b)** under the Pre-1999 Criteria]:

It supports a number of common species at the edge of their range including black-necked stork (jabiru), and jacana. The wetland is of value for maintaining genetic and ecological diversity in the bioregion because there are few of these inland wetlands left, and they are declining.

[Justification against former **Criterion 3(b)** under the Pre-1999 Criteria]:

When flooded, the wetland sustains large numbers of breeding colonial water birds (500,000 in 1998), which feed in the wider wetland area. Waterbird families here include: magpie geese (Anseranatidae), swans and ducks (Anatidae), ibis and spoonbills (Threskiornithidae), herons and egrets (Ardeidae), darters (Anhingidae), cormorants (Phalacrocoracidae), and grebes (Podicipedidae). The region is also important for gallinules (Rallidae), cranes (Gruidae), storks (Ciconiidae), raptors (Accipitridae and Falconidae), shorebirds and waders (Scolopadidae) (See **Section 22** and **Appendix 2**).

Criterion 4: A wetland should be considered internationally important if it supports plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions.

[Justification against former **Criterion 2(c)** under the Pre-1999 Criteria]:

It is of special habitat value particularly as breeding and feeding habitat for large numbers of colonial waterbirds.

Criterion 5: A wetland should be considered internationally important if it regularly supports 20,000 or more waterbirds.

[Justification against former **Criterion 3(a)** under the Pre-1999 Criteria]:

When flooded, the wetland sustains large numbers of breeding colonial water birds (500,000 in 1998), which feed in the wider wetland area. (See Families listed in criterion 3b above. Also see **Section 22** and **Appendix 2**).

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region:

Darling Riverine Plains biogeographic region.

b) biogeographic regionalisation scheme (include reference citation):

Interim Biogeographic Regionalisation for Australia (IBRA) Version 4.0 (Thackway and Cresswell 1995).

16. Physical features of the site:

Describe, as appropriate, the geology, geomorphology; origins - natural or artificial; hydrology; soil type; water quality; water depth, water permanence; fluctuations in water level; tidal variations; downstream area; general climate, etc.

The Gwydir Valley is located west of the Great Dividing Range, within the Murray-Darling drainage system. It is bounded by the Mastermans Ranges to the north, the Great Dividing Range to the east and the Nandewar Range to the south. The Gwydir Wetlands are located on the lower floodplain of the Gwydir River, within the Darling Riverine Plains biogeographic region.

The wetlands are found on Quaternary riverine plain deposits of black and red clayey silt, sand, and coarse gravel (ANCA, 1996).

Annual median rainfall around the junction of the Gwydir and Barwon Rivers is 450mm with more than 50% falling between November and March (Keyte, 1994).

The headwaters of the Gwydir River are west of Armidale and Guyra on the New England Tableland. Copeton Dam (a capacity of 1364 Gegalitres) is located approximately 90 km downstream of the headwaters of the Gwydir River. The only major tributary, the Horton River with its headwaters in the Nandewar Ranges, enters the Gwydir River downstream of Bingara. Above Moree, the Mehi River breaks off to the south. Further distributaries above Moree are the Carole/GilGil Creeks to the north. Downstream of Moree the Gwydir River breaks into two major streams known as the Gingham Watercourse (northern arm) and the Lower Gwydir or Big Leather Watercourse (southern arm) (Keyte, 1994).

The most extensive wetland areas in the Gwydir valley are located along the watercourses, where flat, overland grades allow shallow extensive flooding over large areas of the floodplain. Water extends for approximately 95 kms through a series of natural and constructed channels and swamps (NPWS, unpublished). As a result, intermittent semi-permanent wetlands have developed.

Prior to the construction of the Copeton Dam, the Gwydir catchment could have been described as an inland delta or a closed system. Water only entered the Barwon River during major flood events, and all smaller flows discharged into the Gingham and Lower Gwydir Watercourses. Currently the Gwydir is described as an open system. Although water entering the Gingham and Lower Gwydir watercourses still rarely reaches the Barwon River, water from the Mehi River and to a lesser extent the Gil Gil/ Carole Creeks now reaches the Barwon frequently and at smaller river heights than previously required. Both the Mehi and the Carole/Gil Gil have been channelised to assist with delivery of water to the irrigation industry.

Prior to 1946, the majority of small floods and freshes entered the Lower Gwydir Watercourse, with only large floods reaching the Gingham Watercourse. With the progression of the head of the Gwydir Raft upstream, this situation reversed. The Raft is an accumulation of timber, debris and sediment which has been deposited in the former channel of the Gwydir River downstream of Moree. The formation of this Raft is thought to have occurred over many decades. The process of raft creation appears to have been occurring over a much longer period of time. A combination of human activities, such as clearing in the upper catchment and natural depositional processes, allowed logs and silt to be washed into the river during floods and are regarded as the factors leading to its formation. The resultant accumulation of debris extends for about 35 km upstream to a point 7 km downstream of Moree.

Water pooled behind this blockage and would break out of the Gwydir channel northwards into the Gingham Watercourse and south into the Tyreel Anabranche. It is likely that the Gingham now receives a greater proportion of low to medium flows than it did prior to the formation of the Raft.

A low fixed crested weir was constructed across the Gwydir River upstream of the offtake to the Gingham Watercourse in 1983 to facilitate the diversion of flows into the Lower Gwydir Watercourse. A regulator was also constructed on the Tyreel offtake so as to control flows into this system, and the channel was altered (Keyte, 1994).

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

18. Hydrological values:

Describe the functions and values of the wetland in groundwater recharge, flood control, sediment trapping, shoreline stabilization, etc.

As the Gwydir wetlands are terminal wetlands, they serve to some degree as flood mitigation for downstream areas. The wetlands may prevent the flow of nutrient rich water into the Barwon-Darling system, thus reducing the likelihood of algal blooms. Although the Gingham and the Lower Gwydir watercourses remain terminal, water now flows through to the Barwon River permanently through the Carole Creek and the Mehi River.

Since flooding in the Gwydir wetlands is not always synchronous with flooding of other Murray Darling Basin wetlands, such as the Macquarie Marshes or Narran Lake, the Gwydir wetlands play an important role on a regional scale.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar "Classification System for Wetland Type" present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Tp • Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

Human-made: 1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9 • Zk(c)

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

L, P, N, Ts, Tp, Xf, W.

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

Prior to river regulation, there were around 220 000 hectares of ephemeral and floodplain wetlands on the Gwydir Valley floodplain. Eighty two per cent of this area is dominated by coolibah (*Eucalyptus coolabah*) woodland. Here seasonal, extensive flooding occurs over approximately 20 000 ha of wetland dominated by aquatic plants (Bennett and Green 1991) (See Section 21 and **Appendix 1**).

Vegetation communities are predominantly determined by the frequency and duration of flooding. Variation of vegetation associations with soil types have also been observed. Three identifiable vegetation groups exist: those on high red solodic ridges subject to infrequent flooding for example bumble box (*Eucalyptus poplunea*) and white cypress pine (*Callitris glaucophylla*) communities; those on heavy clay soils in areas subject to periodic inundation for example coolibah (*E. coolabah*) and belah (*Casuarina cristata*) communities; and those on heavy clay soils in channels or depressions subject to frequent inundation for example water couch (*Paspalum distichum*), ribbed spike rush (*Eleocharis plana*), marsh club rush (*Bolboschoenus fluviatilis*) and *Juncus* species (McCosker and Duggin, 1993) (Keyte, 1994).

21. Noteworthy flora:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14, Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

This wetland is probably the largest stand of water couch (*P. disticum*) and marsh club-rush (*B. fluviatilis*) in New South Wales (Bennett and Green, 1991) (McCosker and Duggin, 1993).

Other specific flora include ribbed spike-rush (*E. plana*), tall spike-rush (*Eleocharis sphacelata*), tussock rush (*Juncus aridicola*) and cumbungi (*Typha* sp.), in association with various other aquatic plants including swamp buttercup (*Ranunculus undosus*), water primrose (*Ludwigia peploides*), swamp lily (*Ottelia ovalifolia*), starfruit (*Damasonium minus*), numerous sedges (*Cyperus* sp.) and water milfoils (*Myriophyllum* sp.) (McCosker, pers comm.).

A flora list is attached as **Appendix 1**.

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Since 1982, the New South Wales Bird Atlassers have observed 236 bird species in the Gingham and Lower Gwydir watercourses of which 165 species have been recorded as breeding (Jen Southeron pers comm.).

Many colonial waterbird species - little egret (*Egretta garzetta*), intermediate egret (*Egretta intermedia*), great egret (*Egretta alba*), nankeen night heron (*Nycticorax caledonicus*), straw-necked ibis (*Threskiornis spinicollis*), Australian white ibis (*Threskiornis molucca*) and glossy ibis (*Plegadis falcinellus*) breed in the wetlands (ANCA, 1996). It was estimated that the minimum numbers of birds breeding in the colonies in 1999 was at least 500,000 birds. One estimate was up to 500,000 pairs (Dick Cooper, pers comm.) The breeding of brolga (*Grus rubicundus*) and black swan (*Cygnus atratus*) has also been recorded within the wetlands. Increasing numbers of magpie geese (*Anseranas semipalmata*) have bred in the wetlands during the floods of 1984, 1998 and 1999. (Shane Murphy pers. comm.). This is a significant occurrence since breeding of magpie geese in New South Wales is considered rare.

The black-necked stork (*Ephippiorhynchus asiaticus*) which has been recorded in the Gwydir wetlands is listed as endangered under the NSW *Threatened Species Conservation Act 1995*. A further thirteen species of birds listed as vulnerable under the NSW *Threatened Species Conservation Act* have also been recorded in the wetlands. These include magpie goose (*Anseranas semipalmata*), blue-billed duck (*Oxyura australis*), freckled duck (*Stictonetta naevosa*), Australasian bittern (*Botaurus poiciloptilus*), brolga (*Grus rubicundus*), painted snipe (*Rostratula benghalensis*) comb-crested jacana (*Irediparra gallinacea*), osprey (*Panion haliaetus*), red-tailed black-cockatoo (*Calyptorhynchus banksii*), glossy black cockatoo (*Calyptorhynchus lathami*), turquoise parrot (*Neophema pulchella*), Pied Honeyeater (*Certhionyx variegatus*) and chestnut quail-thrush (*Cinclosoma castanotus*). Thirteen species listed under JAMBA and ten species under CAMBA are also found in the wetlands which include cattle egret* (*Ardeola ibis*), great egret* (*Ardea alba*), glossy ibis (*Plegadis falcinellus*), painted snipe* (*Rostratula benghalensis*), greenshank (*Tringa nebularia*), latham's snipe (*Gallinago hardwickii*), sharp sandpiper (*Calidris acuminata*), black tern (*Chlidonias niger*), caspian tern (*Sterna caspia*), common tern (*Sterna hirundo*), white-throated needletail (*Hirundapus caudactus*), fork-tailed swift (*Aspus pacificus*), barn swallow (*Hirundo rustica*) and rainbow bee-eater* (*Merops ornatus*) (NPWS, unpublished).

*Those marked with an asterisk have been observed breeding in the wetland.

Mammal species occurring within the Gwydir wetlands include eastern water rat (*Hydromys chrysogaster*), kangaroo (*Macropus spp*), swamp wallaby (*Wallabia bicolor*), echidna (*Tachglossus aculeatus*), narrow-nosed planigale (*Planigale tenuirostris*) and several possum and glider species. There is anecdotal evidence of koalas (*Phascolarctos cinereus*) (Spark, unpublished).

Preliminary research indicates that areas of the wetlands are important fish breeding habitat (Siebentritt, 1999). Many species of frogs are also found (McCosker, 1996).

Fauna lists are attached as **Appendix 2**.

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The flat terrain, fertile soils, abundant wildlife and virtually permanent water of the Gwydir wetlands have provided for a range of human activity over a long period of time.

The wetlands were very important to Aboriginal Kamilaroi people long before the arrival of Europeans. There are archeological sites throughout the area. The area provided a range of edible plants and animals, and provided a drought refuge for people. Aboriginal people today are also concerned that the wetlands continue to be healthy.

Upon European arrival, the agricultural possibilities for the region were immediately identified. Wool production was the main industry for the early part of this century. From the late 1940s onwards, higher rainfall and the progression of the raft resulted in increased flooding, causing most landholders to shift the emphasis of their enterprises from sheep to cattle. The large number of old and abandoned woolsheds on properties throughout the wetlands are testimony to this change. By the 1970s beef cattle were the mainstay of the grazing industry. The wetlands became renowned as a reliable area for producing fat cattle when the surrounding areas were experiencing drought (McCosker and Duggin, 1993).

Water from the Gwydir River now also supports a major irrigation industry. The major crop for this industry is cotton.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

If Yes, tick the box ☐ and describe this importance under one or more of the following categories:

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

a) within the Ramsar site:

A mixture of freehold and perpetual leasehold lands which is managed by four private landholders.

b) in the surrounding area:

A mixture of freehold and perpetual leasehold lands which is managed by four private landholders.

25. Current land (including water) use:

a) within the Ramsar site:

The Ramsar site is used for beef cattle and sheep grazing.

b) in the surroundings/catchment:

Outside the Ramsar site the wetlands are used for grazing or have been cleared for cereal crops. Some smaller areas have been developed for the production of irrigated and dryland cotton.

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

a) within the Ramsar site and b) in the surrounding area:

Continuing expansion of the irrigation industry in the wider catchment have lead to the reduction in the frequency and duration of inundation. This has changed vegetation patterns within the wetlands, with areas of primary wetland vegetation being reduced (McCosker and Duggin, 1993). Areas previously supporting water couch (*P. distichum*) and marsh club-rush (*B. fluviatilis*) have now been replaced by lippia (*Phyla canescens*), noogoora burr (*Xanthium occidentale*), bathurst burr (*Xanthium spinosum*), black thistle (*Cirsium vulgare*), variegated thistle (*Silybum marianum*) and black roly-poly and soft roly-poly (*Bassia sclerolaena muricata* and *B. salsola kali*). Of these invasive plants, lippia is the greatest threat and is rapidly spreading (1998 flood), as is water hyacinth (*Eichhornia crassipes*) in the Gingham watercourse (McCosker, pers comm.).

Wetland drying has also resulted in land use changes with a marked increase in cereal cropping. This has had the effect of further reduction of wetland habitat.

Feral animals requiring control are pigs, foxes and cats.

Dead coolabahs are present along depression lines and where water couch dominates. The cause of death is believed to have been excessive inundation during the winter months of the late 1950's and 1970's, although some trees show evidence of ringbarking. There has been minimal to no regeneration of coolabah trees in these areas.

Pesticide contamination is a threat (NPWS unpublished).

b) in the surrounding area:

See factors described in **Section 26a**.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ☐; Ib ☐; II ☐; III ☐; IV ☐; V ☐; VI ☐

c) Does an officially approved management plan exist; and is it being implemented?:

d) Describe any other current management practices:

The important conservation issue currently being addressed in the Gwydir Wetlands is water management, and the provision of environmental flows.

By the early 1980s local landholders expressed concerns about the condition of the watercourse wetlands to the Department of Land and Water Conservation (formerly the Department of Water Resources). Landholders had noted the decline in the number and diversity of plants and animals living in the wetlands. Moreover the reduced flooding had decreased the productivity of grazing land, by as much as 70% (Howard Blackburn, Shane Murphy, pers comm.). The Gwydir Environmental Flows Committee was established to reach a consensus decision over water sharing between consumptive use and the environment.

Sharing rules were formulated, and are being implemented by the Gwydir River Management Committee. Environmental flows have been provided to the wetlands as a result of the sharing agreement over four summers (NSW DLWC, 1998). The process established in the Gwydir Valley was then used as a model for other valleys in the state of NSW.

As a first step towards Ramsar listing, four wetland landholders signed a Memorandum of Understanding on 2nd February 1999. Other signatories included State and Commonwealth governments, the World Wide Fund for Nature and the National Parks Association. This ratified co-operative arrangements for the management of the Ramsar listed areas of the wetland.

Another result of wetland management issues being brought to the attention of NSW Department of Land and Water Conservation (DLWC) was the initiation of an investigation into the specific water needs of the wetlands of the lower Gwydir floodplain. A Steering Committee was formed to oversee the investigation and was comprised of landholders and representatives from DLWC. The Plan will be implemented by the Lower Gwydir Wetland Management Committee and will operate for 3 years after which time it will be reviewed.

Other conservation measures taken include:

- Landholders with water hyacinth on their properties have investigated cooperative models for the management of this invasive species. Control is ongoing for this and other feral species.
- Grazing exclusion plots have been established to monitor the effects of stock (McCosker, 1996).
- Flora and fauna species lists have been established.
- Initial surveys for fish species and habitat have been undertaken (Siebentritt, 1999).
- Pesticide monitoring sites have been established.

28. Conservation measures proposed but not yet implemented:

e.g. management plan in preparation; official proposal as a legally protected area, etc.

The Memorandum of Understanding (MoU) for the Gwydir Wetlands will be implemented. Two of the most important conservation measures outlined in the MoU are the establishment of a Management Group, and the development of individual property action plans.

Monitoring and surveying of flora and fauna species will continue. Surveys of fish species will be expanded. An indicative survey of insects will be sought. Pesticide and grazing sites will be monitored.

The Gwydir River Management Committee will develop a River Management Plan over the next five years. When complete, this will provide the planning framework for the ongoing delivery of environmental flows.

Discussions will be held with other landholders to investigate the possibility of expanding Ramsar listed areas.

29. Current scientific research and facilities:

e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Currently there are no facilities for scientific research available at the Ramsar site, or in the wetlands generally. Various research projects have been undertaken by the University of New England in Armidale; Landmax Consulting, Brisbane; the National Parks and Wildlife Service; NSW Bird Atlassers; the Department of Land and Water Conservation, and Wetland Care Australia.

30. Current communications, education, participation and awareness (CEPA) activities related to or benefiting the site:

e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

Currently there is little formal conservation education undertaken in the area. Landholders have conducted many informal tours for school groups, birdwatchers and water management authority representatives and other interested bodies, when required.

31. Current recreation and tourism:

State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.

The Ramsar site is entirely privately owned thus is not available as a public recreation site.

32. Jurisdiction:

Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.

Property name	County	Parish
"Old Dromana"	County of Benarba	Parish of Wandoona
"Crinolyn"	County of Benarba	Parish of Crinoline
"Windella"	County of Benarba	Parish of Dundunga
"Goddard's Lease"	County of Benarba	Parish of Gingham

Territorial: Commonwealth of Australia, State of New South Wales, Shire of Moree Plains.

Functional: NSW National Parks and Wildlife Service
NSW Department of Land and Water Conservation
NSW Department of Fisheries
NSW Department of Urban Affairs and Planning
NSW Department of Agriculture

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

Gwydir Ramsar Management Group (as outlined in the Memorandum of Understanding) convened by:

Cath Webb

WWF/NPA Western NSW Conservation Project
GPO Box 528
Sydney NSW 2001
Ph (02) 9281 5515 Fx (02) 9281 1060

National Parks and Wildlife Service Western Region
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Department of Land and Water Conservation Barwon Region
PO Box 550
Tamworth NSW 2340
Ph (02) 6764 5900 Fx (02) 6764 5982

34. Bibliographical references:

Scientific/technical references only. If biogeographic regionalisation scheme applied (see 15 above), list full reference citation for the scheme.

ANCA, (1996). *Directory of Important Wetlands in Australia: Second Edition*. Australian Nature Conservation Agency, Canberra.

Bennett, M and Green, J. (1993) *Preliminary Assessment of Gwydir Wetlands Water Needs*. Department of Water Resources, Technical Services Division.

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WWF/NPA, NPWS, EA (1999). *Memorandum of Understanding: Gingham and Lower Gwydir (Big Leather) Watercourses Gwydir Wetlands Ramsar Site*.

Please return to: **Ramsar Convention Secretariat, Rue Mauverney 28, CH-1196 Gland, Switzerland**
Telephone: +41 22 999 0170 • Fax: +41 22 999 0169 • e-mail: ramsar@ramsar.org

Appendix 1. Native flora species present in the Gwydir wetlands

Common Name	Scientific Name
Ridges	
Bimble Box	<i>Eucalyptus populnea</i>
Wilga	<i>Geijera parviflora</i>
Leopardwood	<i>Flindersia maculosa</i>
Cypress Pine	<i>Callitris glaucophylla</i>
Whitewood	<i>Atalata hemiglauc</i>
Rosewood	<i>Alectryon oleifolius</i>
Leopardwood	<i>Flindersia maculosa</i>
Budda	<i>Eremophila mitchelli</i>
Native Orange	<i>Capparis mitchelli</i>
Wild Lemon	<i>Canthium oleifolium</i>
Floodplain	
Coolibah	<i>Eucalyptus coolabah</i>
Myall	<i>Acacia pendula</i>
River Cooba	<i>Acacia stenophylla</i>
Cooba	<i>Acacia salicina</i>
Mimosa	<i>Acacia farnesiana</i>
Belah	<i>Casuarina cristata</i>
Depressions	
Lignum	<i>Muehlenbeckia florulenta</i>
Water Couch	<i>Paspalum distichum</i>
Marsh Club-rush	<i>Bolboschoenus fluviatilis</i>
Ribbed Spike-rush	<i>Eleocharis plana</i>
Nardoo	<i>Marsilea drummondii</i>
Tussock Rush	<i>Juncus aridicola</i>

Appendix 2: Native fauna species recorded in the Gwydir wetlands

Common Name

Scientific Name

Reptiles and Amphibians

Blue tongue lizard	<i>Tiliqua</i> sp. (?occipitalis)
Prickly Gecko	
Gilberts Dragon	
Tree Skink	<i>Egernia strolata</i>
Boulenger's Skink	
Carnaby's Skink	
Spotted Marsh Frog	<i>Limnodynastes tasmaniensis</i>
Barking Marsh Frog	<i>Limnodynastes fletcheri</i>
Salmon Striped Frog	<i>Limnodynastes salmini</i>
Striped Burrowing Frog	<i>Litoria alboguttata</i>
Broad-palmed Frog	<i>Litoria latopalmata</i>
Desert Tree Frog	<i>Litoria rubella</i>
Peron's Tree Frog	<i>Litoria peronii</i>
Green Reed Frog	<i>Litoria fallax</i>
Green Tree Frog	<i>Litoria caerulea</i>
Waterholding Frog	<i>Cyclorana platycephala</i>
Warty Waterholding Frog	<i>Cyclorana verrucosa</i>
Crucifix Frog	<i>Notaden bennettii</i>
Brown Froglet	<i>Crinia parinsignifera</i>
Painted Burrowing Frog	<i>Neobatrachus sudelli</i>

Mammals

Eastern Grey Kangaroo	<i>Macropus giganteus</i>
Common Wallaroo	<i>Macropus robustus</i>
Red Kangaroo	<i>Macropus rufus</i>
Swamp Wallaby	<i>Wallabia bicolor</i>
Koala	<i>Phascolarctos cinereus</i>
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>
Narrow-nosed Planigale	<i>Planigale tenuirostris</i>
Sugar Glider	<i>Petaurus breviceps</i>
Common Brushtail Possum	<i>Trichosurus vulpecula</i>
Water Rat	<i>Hydromys chrysogaster</i>

Birds

Emu	<i>Dromaius novaehollandiae</i>
Brown Quail	<i>Coturnix ypsilophora</i>
Stubble Quail	<i>Coturnix pectoralis</i>
King Quail	<i>Coturnix chinensis</i>
Maned Duck (Wood Duck)	<i>Chenonetta jubata</i>
Plumed Whistling Duck	<i>Dendrocygna eytoni</i>
Wandering Whistling Duck	<i>Dendrocygna arcuata</i>
Freckled Duck	<i>Stictonetta naevosa*</i>
Blue-billed Duck	<i>Oxyura australis*</i>

Musk Duck
 Australian Shelduck
 Black Swan
 Magpie Goose
 Hardhead
 Australasian Shoveler
 Pink-eared Duck
 Pacific Black Duck
 Grey Teal
 Chestnut Teal
 Australian Little Grebe
 Great Crested Grebe
 Hoary-headed Grebe

Darter
 Great Cormorant
 Little Black Cormorant
 Little Pied Cormorant
 Pied Cormorant
 Australian Pelican
 Black-necked Stork
 Pacific Heron
 White-faced Heron
 Cattle Egret
 Great Egret
 Intermediate Egret
 Little Egret
 Nankeen Night Heron
 Glossy Ibis
 Australian White Ibis
 Straw-necked Ibis
 Royal Spoonbill
 Yellow-billed Spoonbill
 Australasian Bittern
 Little Bittern

Pacific Baza
 Black-shouldered Kite
 Swamp Harrier
 Spotted Harrier
 Black Kite
 Square-tailed Kite
 Whistling Kite
 Osprey
 Little Eagle
 Wedge-tailed Eagle
 White bellied sea eagle
 Black Falcon
 Brown Falcon
 Nankeen Kestrel
 Australian Hobby
 Grey Falcon
 Peregrine Falcon

Biziura lobata
Tadorna tadornoides
Cygnus atratus
*Anseranas semipalmata**
Aythya australis
Anas rhynchotis
Malacorhynchus membranaceus
Anas superciliosa
Anas gracilis
Anas castanea
Tachybaptus novaehollandiae
Podiceps cristatus
Poliocephalus poliocephalus

Anthinga melanogaster
Phalacrocorax carbo
Phalacrocorax sulcirostris
Phalacrocorax melanoleucos
Phalacrocorax varius
Pelecanus conspicillatus
*Ephippiorhynchus asiaticus***
Ardea pacifica
Egretta novaehollandiae
Ardeola ibis
Ardea alba
Ardea intermedia
Egretta garzetta
Nycticorax caledonicus
Plegadis falcinellus
Threskiornis molucca
Threskiornis spinicollis
Platalea regia
Platalea flavipes
*Botaurus poiciloptilus**
Ixobrychus minutus

Aviceda subcristata
Elanus axillaris
Circus approximans
Circus assimilis
Milvus migrans
Lophoictinia isura
Haliastur sphenurus
*Pandion haliaetus**
Hieraaetus morphnoides
Aquila audax
Haliaeetus leucogaster
Falco subniger
Falco berigora
Falco cenchroides
Falco longipennis
Falco hypoleucos
Falco peregrinus

Collared Sparrowhawk	<i>Accipiter cirrhocephalus</i>
Brown Goshawk	<i>Accipiter fasciatus</i>
Grey Goshawk	<i>Accipiter novaehollandiae</i>
Brolga	<i>Grus rubicundus*</i>
Buff-banded Rail	<i>Gallirallus philippensis</i>
Baillon's Crake	<i>Porzana pusilla</i>
Australian Spotted Crake	<i>Porzana fluminea</i>
Spotless Crake	<i>Porzana tabuensis</i>
Black-tailed Native Hen	<i>Gallinula ventralis</i>
Dusky Moorhen	<i>Gallinula tenebrosa</i>
Purple Swampphen	<i>Porphyrio porphyrio</i>
Eurasian Coot	<i>Fulica atra</i>
Australian Bustard	<i>Ardeotis australis</i>
Painted Button-quail	<i>Turnix varia</i>
Little Button-quail	<i>Turnix velox</i>
Red-chested Button-quail	<i>Turnix pyrrhothorax</i>
Red-backed Button-quail	<i>Turnix maculosa</i>
Latham's Snipe	<i>Gallinago hardwickii</i>
Greenshank	<i>Tringa nebulari</i>
Black-winged Stilt	<i>Himantopus himantopus</i>
Red-capped Plover	<i>Charadrius ruficapillus</i>
Inland Dotterel	<i>Charadrius australis</i>
Red-kneed Dotterel	<i>Erythronyx cinctus</i>
Red-necked Avocet	<i>Recurvirostra novaehollandiae</i>
Banded Lapwing	<i>Vanellus tricolour</i>
Masked Lapwing	<i>Vanellus miles</i>
Black-fronted Dotterel	<i>Elseyaornis melanops</i>
Double-banded Plover	<i>Charadrius bicinctus</i>
Sharp-tailed Sandpiper	<i>Calidris acuminata</i>
Painted Snipe	<i>Rostratula benghalensis*</i>
Marsh Sandpiper	<i>Tringa stagnatilis</i>
Comb-crested Jacana	<i>Irediparra gallinacea*</i>
Bush Stone-curlew	<i>Burhinus grallarius</i>
Banded Stilt	<i>Cladorhynchus leucocephalus</i>
Silver Gull	<i>Larus novaehollandiae</i>
Caspian Tern	<i>Sterna caspia</i>
Whiskered Tern	<i>Chidonias hybridus</i>
Common Tern	<i>Sterna hirundo</i>
Gull-billed Tern	<i>Sterna nilotica</i>
Crested Pigeon	<i>Ocyphaps lophotes</i>
Common Bronzewing	<i>Phaps chalcoptera</i>
Diamond Dove	<i>Geopelia cuneata</i>
Peaceful Dove	<i>Geopelia striata</i>
Bar-shouldered Dove	<i>Geopelia humeralis</i>
Rock Dove	<i>Columba livia</i>
Galah	<i>Cacatua roseicapilla</i>
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami*</i>

Red-tailed Black-Cockatoo	<i>Calyptorhynchus banksii</i> *
Red-winged Parrot	<i>Aprosmictus erythropterus</i>
Cockatiel	<i>Nymphicus hollandicus</i>
Red-rumped Parrot	<i>Psephotus haematonotus</i>
Turquoise Parrot	<i>Neophema pulchella</i> *
Eastern Rosella	<i>Platycercus eximius</i>
Pale-headed Rosella	<i>Platycercus adscitus</i>
Australian Ringneck	<i>Barnardius zonarius</i>
Blue Bonnett	<i>Northiella haematogaster</i>
Mulga Parrot	<i>Psephotus varius</i>
Budgerigah	<i>Melopsittacus undulatus</i>
Fan-tailed Cuckoo	<i>Cacomantis flabelliformis</i>
Brush Cuckoo	<i>Cacomantis variolosus</i>
Black-eared Cuckoo	<i>Chrysococcyx osculans</i>
Shining Bronze Cuckoo	<i>Chrysococcyx lucidus</i>
Channel-billed Cuckoo	<i>Scythrops novaehollandiae</i>
Pallid Cuckoo	<i>Cuculus pallidus</i>
Horsfield's Bronze-Cuckoo	<i>Chrysococcyx basalis</i>
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Sacred Kingfisher	<i>Todiramphus sancta</i>
Red-backed Kingfisher	<i>Todiramphus pyrrhopygia</i>
Azure Kingfisher	<i>Alcedo azurea</i>
Rainbow Bee-eater	<i>Merops ornatus</i>
Dollarbird	<i>Eurystomus orientalis</i>
Brown Treecreeper	<i>Climacteris picumnus</i>
Barn Owl	<i>Tyto alba</i>
Grass Owl	<i>Tyto capensis</i>
Barking Owl	<i>Ninox connivens</i>
Southern Boobook	<i>Ninox novaeseelandiae</i>
Australian Owlet-nightjar	<i>Aegotheles cristatus</i>
Spotted Nightjar	<i>Eurostopodus argus</i>
Tawny Frogmouth	<i>Podargus strigoides</i>
Fork-tailed Swift	<i>Apus pacificus</i>
White-backed Swallow	<i>Cheramoeca leucosternus</i>
Welcome Swallow	<i>Hirundo neoxena</i>
Tree Martin	<i>Hirundo nigricans</i>
Fairy Martin	<i>Hirundo ariel</i>
Bassian Thrush	<i>Zoothera lunulata</i>
Singing Bushlark	<i>Mirafrja javanica</i>
Rufous Songlark	<i>Cinclorhamphus mathewsi</i>
Richard's Pipit	<i>Anthus novaeseelandiae</i>
Brown Songlark	<i>Cinclorhamphus cruralis</i>
Ground Cuckoo-shrike	<i>Coracina maxima</i>
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>
White-winged Triller	<i>Lalage sueurii</i>
Red-capped Robin	<i>Petrorica goodenovii</i>
Hooded Robin	<i>Melanodryas cucullata</i>
Eastern Yellow Robin	<i>Eopsaltria australis</i>

Jacky Winter
 Rufous Whistler
 Crested Bellbird
 Grey Shrike-thrush
 Restless Flycatcher
 Satin Flycatcher
 Leaden Flycatcher
 Grey Fantail
 Willie Wagtail
 Chestnut Quail-thrush
 Grey-crowned Babbler
 White-browed Babbler
 Crested Shrike-tit
 Crested Bell-bird
 Little Grassbird
 Golden-headed Cisticola
 Superb Fairy-wren
 Splendid Fairy-wren
 White-winged Fairy-wren
 White-browed Scrubwren
 Western Gerygone
 White-throated Gerygone
 Weebill
 Southern Whiteface
 Inland Thornbill
 Buff-rumped Thornbill
 Yellow-rumped Thornbill
 Chestnut-rumped Thornbill
 Yellow Thornbill
 Brown Treecreeper

Spiny-checked Honeyeater
 Little Friarbird
 Noisy Friarbird
 Yellow-throated Miner
 Noisy Miner
 Blue-faced Honeyeater
 Brown-headed Honeyeater
 Black-chinned Honeyeater
 White-plumed Honeyeater
 Singing Honeyeater
 Striped Honeyeater
 Brown Honeyeater
 Painted Honeyeater
 Black Honeyeater
 Pied Honeyeater

Silvereye
 Mistletoebird
 White-fronted Chat
 Orange Chat
 Crimson Chat
 Spotted Pardalote

Microeca fascinans
Pachycephala rufiventris
Oreoica gutturalis
Colluricincla harmonica
Myiagra inquieta
Myiagra cyanoleuca
Myiagra rubecula
Rhipidura fuliginosa
Rhipidura leucophrys
*Cinclosoma castanotus**
Pomatostomus temporalis
Pomatostomus superciliosus
Falcunculus frontatus
Oreoica gutturalis
Megalurus gramineus
Cisticola exilis
Malurus cyaneus
Malurus lamberti
Malurus leucopterus
Sericornis frontalis
Gerygone fusca
Gerygone olivacea
Smicrornis brevirostris
Aphelocephala leucopsis
Acanthiza apicalis
Acanthiza reguloides
Acanthiza chrysorrhoa
Acanthiza uropygialis
Acanthiza nana
Climacteris picumnus

Acanthagenys rufogularis
Philemon citreogularis
Philemon corniculatus
Manorina flavigula
Manorina melanocephala
Entomyzon cyanotis
Melithreptus brevirostris
Melithreptus gularis
Lichenostomus penicillatus
Lichenostomus virescens
Plectorhyncha lanceolata
Lichmera indistincta
Grantiella picta
Certhionyx niger
*Certhionyx variegatus**

Zosterops lateralis
Dicaeum hirundinaceum
Ephthianura albifrons
Ephthianura aurifrons
Ephthianura tricolor
Pardalotus punctatus

Striated Pardalote	<i>Pardalotus striatus</i>
Diamond Firetail	<i>Emblema guttata</i>
Double-barred Finch	<i>Taeniopygia bichenovii</i>
Zebra Finch	<i>Taeniopygia guttata</i>
Plum-headed Finch	<i>Neochmia modesta</i>
Chestnut-breasted Mannikin	<i>Lonchura castaneothorax</i>
Eurasian Tree Sparrow	<i>Passer montanus</i>
House Sparrow	<i>Passer domesticus</i>
Common Starling	<i>Sturnus vulgaris</i>
Olive-backed Oriole	<i>Oriolus sagittatus</i>
Spangled Drongo	<i>Dicrurus bracteatus</i>
Australian Magpie-lark	<i>Grallina cyanoleuca</i>
White-winged Chough	<i>Corcorax melanorhamphos</i>
Apostlebird	<i>Struthidea cinerea</i>
Dusky Woodswallow	<i>Artamus cyanopterus</i>
Black-faced Woodswallow	<i>Artamus cinereus</i>
Masked Woodswallow	<i>Artamus personatus</i>
White-browed Woodswallow	<i>Artamus superciliosus</i>
White-breasted Woodswallow	<i>Artamus leucorhynchus</i>
Pied Butcherbird	<i>Cracticus nigrogularis</i>
Grey Butcherbird	<i>Cracticus torquatus</i>
Australian Magpie	<i>Gymnorhina tibicen</i>
Spotted Bowerbird	<i>Chlamydera maculata</i>
Torresian Crow	<i>Corvus orru</i>
Australian Raven	<i>Corvus coronoides</i>

Key:

** - Species listed as Endangered under Schedule 1 of the NSW *Threatened Species Conservation Act 1995*

* - Species listed as Vulnerable under Schedule 2 of the NSW *Threatened Species Conservation Act 1995*