# Information Sheet on Ramsar Wetlands (RIS)

*Categories approved by Recommendation 4.7, as amended by Resolution VIII.13 of the Conference of the Contracting Parties.*

Note for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.

2. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Bureau. Compilers are strongly urged to provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of maps.

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

Rachel Kelleher
PO Box 20025
Te Rapa
Hamilton

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DD MM YY

Designation date | Site Reference Number

**2. Date this sheet was completed/updated:**

24 November 2004

**3. Country:**

New Zealand

**4. Name of the Ramsar site:**

Whangamarino Wetland

**5. Map of site included:**

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

**a) hard copy** (required for inclusion of site in the Ramsar List): Yes, attached

**b) digital (electronic) format** (optional): Available if required as JPEG images of whole map and/or GIS shapefile

**6. Geographical coordinates** (latitude/longitude):

175° 09'E long 37° 206'S lat

**7. General location:**

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

Located in the Waikato in the North Island, 62 km south of Auckland

**8. Elevation:** (average and/or max. & min.)

Average elevation: 4.2.m above sea level.
Maximum: 5.95 m
Minimum: 3.62 m

**9. Area:** (in hectares)

5923 hectares

**10. Overview:**

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

The Whangamarino wetland is the second largest bog and swamp complex in the North Island of New Zealand. 239 wetland plant species have been recorded from the area of which 60% are indigenous, with several classified rare or vulnerable. It is a notable waterbird habitat and some tens of thousands of waterfowl use the wetland from late autumn to spring depending on water levels.

**11. Ramsar Criteria:**

Circle or underline 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).

**1 • 2 • 3 • 4 • 5 • 6 • 7 • 8**

**12. Justification for the application of each Criterion listed in 11. 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).

The Whangamarino Wetland regularly supports 20% of the NZ population of Australasian bittern, 7% of the population of black swan and 5% of the population of grey teal. (criterion 6)

**13. 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:**

**b) biogeographic regionalisation scheme** (include reference citation):

**14. 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 Whangamarino wetland is contained within three large shallow basins drained by the Maramarua and Whangamarino Rivers and the Reao Stream. A few small islands of siltstone outcrop within the wetland. The most significant geological factor for management of the wetland is the presence of coal below the wetland. The coal is some 400-500 metres beneath the surface of the Reao Arm and increases elsewhere to an average depth of 800 metres below the surface.

The predominant soils of the wetland are organic peat soils which form in the hollows and on the lowlying flats where the water table is permanently high and anaerobic conditions have led to the accumulation of organic matter. Recent soils from alluvium have formed over the organic soils or have mixed with organic soils along the margins of the rivers and streams in the wetland where inorganic materials are periodically being added to the land surface.

The climate resembles that of much of the lower Waikato Basin with an average annual rainfall of 1200 mm. Temperatures are mild with mean daily values ranging from 19oC in summer to about 9oC in winter. Frosts are infrequent and fogs common in winter. Westerly winds prevail and average annual sunshine hours are about 2050-2150.

**15. Physical features of the catchment area:**
Describe the surface area, general geology and geomorphological features, general soil types, general land use, and climate (including climate type).

The wetland is bounded to the east by the Maungaroa fault and to the west by a range of low hills from Te Kauwhata to Meremere. To the east is the Hapuakohe Range which dates from Upper Jurassic age and clays eroded from these hills form the base of the wetland. More recent Waitemata sediments form the base of the low hills on the other side of the wetland and above this base are gravels, sands and clays from the Whangamarino formation. These materials also form emergent islands of high ground in the wetland.

Whangamarino wetland in non-flood conditions is fed by a water catchment area of some 48,900 ha. In a flood, the wetland also receives water from the greater Waikato River catchment via Lake Waikare.

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**16. Hydrological values:**

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

In its uncontrolled (pre 1959) state, during high flow conditions the Waikato River water flowed into Lake Waikare north of Ohinewai by means of reverse flows up Te Onetea and Rangiriri Streams. The lake acted as a major ponding area and once water levels reached a certain point it flowed over land into the Whangamarino wetland. From there the waters eventually drained back into the Waikato River via the Whangamarino wetland and River. Also, as the Waikato River rose, flows reversed up the Whangamarino River and the wetland then acted as a ponding areas for direct Waikato rover water as well as overflow from Lake Waikare.

The lower Waikato-Waipa Flood Protection Scheme began in 1961 with the aim of permitting limited development of land for agriculture protected by stop-banking and pumping. The remainder of the wetland was to act as a controlled flood ponding area for the Whangamarino, Maramarua and Kopuku river catchments, with a capacity of 60 million cubic metres of water. The controlled ponding function of the wetland was achieved in part by erecting a control structure at the confluence of the Whangamarino and Waikato rivers to prevent direct backflow by the Waikato and by installing at outlet control at Lake Waikare.

In addition to the development of the flood protection scheme the hydrology of the wetland has been greatly impacted by sand abstraction and the development of hydro-power generation plants on the Waikato River. Agricultural development within the wetland catchments has also resulted in the loss of large areas wetland. In 1994, the Department of Conservation and Auckland/Waikato Fish & Game Association commissioned the construction of a rock rubble weir on the Whangamarino River to reinstate the pre 1960's hydrological regime. During 1995 the weir was damaged by an extreme flood event but was reinstated in 2001 and is now fully functioning providing improved water levels over 2000ha of the mineralised areas.

Water levels in the peat bogs fluctuate by about 10 cm with the mineralised zone fluctuating considerably. Water levels in the mineralised zone can vary by about 2-2.5 m during the year.

The majority of wetland waterways are highly turbid as a result of carrying high levels of silt from Lake Waikare or due to the leaching of humic materials from the peat area. The Maramarua arm carries high silt loads from the eastern hills and an adjoining open cast coal mining overburden.

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**17. 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*.

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

**Human-made: 1 • <u>2</u> • 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.

U
Xf

Tp
M
Ts

**18. General ecological features:**

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site.

The vegetation within the wetland is closely linked to the pattern of bog and swamp. The variation between extremes of acidic peat bog and mineralised swamp is reflected in a diversity of plant associations with some 3000 hectares containing peat bog plant species and some 2600 hectares containing swampland vegetation.

The peat bogs contain relatively few plant species almost all of which are indigenous. Sedges (*Baumea, Schoenus* and *Tetraria* spp), wirerush (*Empodisma minus)*, umbrella fern (*Gleichenia dicarpa)* and manuka (*Leptospermum scoparium)* are the dominat species. The most common peat bog plants associations are *Baumea* dominant with manuka present (40% approx), manuka dominant with some *Baumea* specis (20% approx) and manuka with *Schoenus*. (Note: percentages relate to the peat bog area not the entire wetland).

The swamplands support a more diverse range of plants many of which are exotic species. Willows (*Salix spp)* dominate some areas while other sites comprise herbaceous vegetation only. Water plantain (*Alisma plantago-aquatica)*, willow weeds (*Persicaria spp)*, water purslane (*Ludwigia palustris)*, *Carex* sedges, *Juncus* rushes, buttercups (mostly *Ranunculus flammula)* and various grasses become abundant in summer and autumn as water levels drop. Seed production from these and other herbs are of great importance to waterfowl.

Nineteen macrophyte species are found in aquatic habitats in the wetland. These include submerged and free floating plants. The vegetation of rivers, streams and flowing water around the wetland consist of extensive beds of submerged and semi-emergent plants forming rafts of vegetation extending from the banks. Much of the water in main waterways is coloured by peat and support various species able to withstand turbid water conditions. The introduced macrophytes, *Egeria densa* and *Ceratophyllum demersum* are most widespread in these waters.

The large open water bodies contain submerged *Nitella* species. *Myriophylumm propinquim* and *Potamogeton* species. In areas protected from the wind free floating *Azolla rubra* is associated with semi-emergents. In small ponds and sheltered open water areas, often at the edges of swamp and in areas bordered by willows, free floating species known collectively as duckweed often form a complete coverage. Floating sweet grass (*Glyceria maxima)* is aggressively colonising large areas of shallow open water channels and river margins.

Eighteen species of fish have been recorded in the wetland. Both long and shortfin eels, but especially shortfin, provide major commercial fisheries. Common smelt are found in the two rivers and inanga, catfish, goldfish, rudd and koi carp are abundant. Inanga are common in the lower reaches of rivers and as such the Whangamarino provides a vast potential habitat for these fish that contribute to the whitebait catch each spring.

A number of invertebrates occur in the wetland including seven species of molluscs, seven species of water flea, amphipods, the common northern crayfish and a fresh water crab. Large numbers of shrimp (*Tenagomysis chiltioni)* and P*aratya curvirostris* appear periodically in the Whangamarino River. Aquatic insect life includes dragonflies, damselflies, water beetles, non-biting midges, craneflies, midges and a tiny water skate *Microvelia* is possibly the most abundant animal in the wetland. The only species of moth in New Zealand with an aquatic larva (*nymphyla nitens)* is common in the wetland.

Two species of Australian green bell frog (*Litoria aurea* and *raniflormis)* have been found mainly in fertile swamps.

The wetland is an important habitat for a range of bird species including rare and endangered species (further details in Section 20). The following species are present in significant numbers:
NZ Shoveler Duck (*Anas rhynchotis variegata)* – This endemic species is classified as a game bird. In the Whangamarino, the maximum number present during winter and spring vary between 2000-3000 birds. They are widespread throughout the country but favour fertile lowland swamps and this wetland is one of the species most significant Waikato habitats.
Grey Duck (*Anas superciliosa)* – This game bird is native to New Zealand and widely distributed. As with other species it uses the wetland on a seasonal basis especially for wintering and breeding. They are less adaptable than the more common game bird, the mallard, favouring more inaccessible wetlands such as the Whangamarino. The wintering population is estimated at 6000-7000.
Mallard *(Anas platyrhnchos)* – These gamebirds were introduced into New Zealand in the 1860s and are widespread. Mallards are the most common duck in the wetlands where mineralised swamps provide a major wintering habitat for the Waikato population. Winter-spring can see bird numbers exceeding 20,000 to 25,000. Birds move to nearby lakes during dry periods.
Black Swan (*Cygnus atratus)* – Introduced in 1864, this gamebird is found throughout most of New Zealand. The wetland is important for Waikato stocks of the swan species during winter and spring when water levels are high, with numbers varying between 1500 to 3000 at the peak.

A number of introduced mammals are present in the wetland including possums, mustelids and cats. Domestic livestock often graze the edge of the wetland.

**19. Noteworthy flora:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. 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*.

*Fuchsia perscandens* - The northern most record of this species of creeping New Zealand fuchsia is in an area of grazed remnanat kahikatea forest near the Kopuku mine.
*Miriophyllum robustum* – This water milfoil is vulnerable but has been recorded in several areas of the wetland.
*Anzybas carseii* – A very uncommon orchid known to be growing in the Reao Arm.
*Lycopodium serpentinum* – This club moss is also in the Reao Arm and is vulnerable as is the fern, *Cyclosorus interruptus.*

A number of other species have indeterminate status – *Utricularia lateriflora* (Bladderwort), *Utricularia australis (*floating bladderwort) and *Utricularia novae-zelandiae.*

Whangamarino wetland is rich in mosses and thirteen new species have been added to the New Zealand flora from this area. Lichens are also well represented with *Pseudocyphellaria sereciofulva* of special interest.

**20. Noteworthy fauna:**

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 12. 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*.

Australasian Bittern (*Botaurus poiciloptilus)* – The total New Zealand population of this native species is possibly less than 1000 of which 200-250 may dwell in the wetland. This is the major breeding area in the Waikato. Bittern are recorded from most types of vegetation but a high proportion occurs in mineralised swamp areas. They have a vulnerable status.
Spotless Crake (*Porzana tabuensis plumbea)* – These birds are in low numbers and restricted largely to swamp margins, particularly between pastureland and peat bogs where vegetation standing in water enables them to avoid predators.

North Island Fernbird (*Bowdleria punctata vealeae)* – Some thousands of pairs of this endemic and regionally vulnerable species inhabit the wetland, forming one of the largest populations in New Zealand. Since they are territorial and poor fliers, fernbirds are totally dependent on vegetation for cover.
Marsh Crake (*Porzana pusilla affinis*) – These birds are in low numbers throughout the wetland.
Grey Teal (*Anas gibberifrons)* – Swamp areas of the wetland are important wintering and breeding habitats for grey teal, a native and absolutely protected species. Winter-spring populations vary between 2000-3000 birds. Several breeding areas have been provided by community efforts.
Black Mudfish (*Neochanna diverses)* – Found throughout the wetland in permanent and temporary water bodies, these small endemic galaxiid fish are swamp dwellers with indeterminate status. They are regarded as being of national importance.

**21. Social and 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 pre 1860 (Maori) history of the wetland is not particularly well known. There are at least nine former pa (Maori fortress) sites around the eastern margins of the wetland but on the western side pa sites tend to be in close proximity to the Waikato River. The wetland, especially the waterways, was a valuable source of fish and fowl for early Maori inhabitants.

Post 1860 history of the Whangamarino is linked to land policy beginning with the confiscation of land from the Waikato Maori following the Waikato Campaign of 1863-64. Governments of the day then sold the most suitable land for production to new settlers and the least desirable (wetland) remained Crown land. Principal events in relation to the wetland appear to be:

- Use of the waterways for stock movement by barge and small boat
- Planting of willow stakes near Rangiriri in 1885 and wattles near Te Kauwhata for tannin
- Flax farming on swamp areas near Kopuku Canal and Island Block Road
- Use of waterway margins for wildfowl hunting
- New Zealand Wildlife Service involvement with the management of the wetland from at least 1962, this responsibility taken over by the Department of Conservation in 1987.

The conservation versus development debate over the wetland has taken place from the 1960's to the present day and culminated in a decision by the Planning Tribunal that drainage should not proceed on private properties in the Reao Arm because ownership of the land did not in itself carry the right to divert natural water on the land.

**22. Land tenure/ownership:**
(a) within the Ramsar site: Whangamarino Wetland is gazetted as either Wetland or Wildlife Management Reserve under the Conservation Act 1987 and managed by the Department of Conservation. Part of the Ramsar site is land owned by the New Zealand Fish & Game Association.

(b) in the surrounding area: Mainly freehold agricultural (diary and cropping) land, some flood protection areas and exotic forestry. Open cast mining of coal and rock is also undertaken within close proximity to the wetland.

**23. Current land (including water) use:**
(a) within the Ramsar site: Some 240 hectares of the wetland are leased for grazing on a temporary basis under 13 grazing concessions. Most grazing concessions contain conditions regarding stocking rates and restricting grazing to the summer months.
The wetland forms part of an important eel fishery and there is some commercial fishing of grey mullet from the Whangamarino River. Apiculturalists also utilise the wetland for their bee hives.

Some 73 hectares are leased for coalfield related purposes including overburden dumping on the northeastern margin.

(b) in the surroundings/catchment: Below the wetland margin, use of developed areas vary from conventional sheep and beef cattle farming to dairying. Market gardening and cash cropping occurs on land which is part of the Motukaraka and Bell Road drainage schemes.

Above the wetland margin, pastoral uses predominate, including sheep, beef, dairy and goat farming. Forestry plantations are established at Maramarua to the east of the wetland. To the west around Te Kauwhata horticulture and viticulture are important. The general trend is towards more intensified management. At Kopuku, a large opencast mine exists with overburden dumps adjoining and in part extending over the wetland creating a compression ground wave which has affected the adjoining peatland topography.

**24. 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:

Invasion by plant pests in particular grey willow (*Salix cinerea*), royal fern (*Osmunda regalis*), reed canary grass (*Phalaris arundinacea*), *Glyceria maxima*

(b) in the surrounding area:

**25. Conservation measures taken:**

List national category and legal status of protected areas, including boundary relationships with the Ramsar site; management practices; whether an officially approved management plan exists and whether it is being implemented.

- Hydrological management
- Possum control – as part of Animal Health Board Tb vector control
- Deer control (removal of deer from peat bog areas)
- Restorative planting
- Fencing out of grazing animals
- Gamebird habitat restoration
- Plant pest control

**26. Conservation measures proposed but not yet implemented:**

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

- Development of a site specific management plan

**27. Current scientific research and facilities:**

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

- Australasian Bittern monitoring
- Ongoing vegetation and hydrological monitoring
- Research into the impact and feasibility of controlling royal fern *Osmunda regalis*
- Annual monitoring of black mudfish populations
- Annual control of plant pest species including a large aerial control programme
- Threatened plant monitoring and research trials

**28. Current conservation education:**

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

- Part of a wetland trail established by the National Wetland Trust

- Booklet on the Ramsar sites in New Zealand covering the Whangamarino Wetland to be published in February by the National Wetland Trust and funded by the Department of Conservation
- Included in *Waikato Wetlands : Teacher Resource Kit* published by Department of Conservation.

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

Duckshooting is the largest recreational activity in the Whangamarino with ducks and swans being the main gamebirds of interest.
Gundog trials are usually held monthly from july to April near the junction of the Whangamarino and Maramarua Rivers. Some 600 days a year are spent in the wetland by participants involved in this activity.
Boating is mostly related to duckshooting. Only clearly defined waterways are suitable for power boating and then only during higher water levels. The River channels are often frequented by kayakers.
Bare foot water skiing is carried out on the Whangamarino River downstream of the weir
Fishing by local people occurs at the Whangamarino-Maramarua confluence for coarse fish and also eel and mullet. Cross bow hunting of koi carp is becoming a significant recreational activity in the Whangamarino.

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

Territorial: Waikato Regional Council
Waikato District Council
Functional: Department of Conservation

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**31. 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.

Tony Roxburgh
Waikato Area manager
Department of Conservation
Box 20025
Te Rapa
HAMILTON

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**32. Bibliographical references:**
scientific/technical references only. If biogeographic regionalisation scheme applied (see 13 above), list full reference citation for the scheme.

The following technical and monitoring reports are held by the Department of Conservation:

Champion P.D. (2000). Sedge restoration monitoring 1999-2000, Whangamarino Wetland. NIWA Client Report DOC 00226.

Champion P.D. (2001). Sedge restoration monitoring 2000-2001, Whangamarino Wetland. NIWA Client Report DOC 01226.

Champion P.D. (2002). Sedge restoration monitoring 2001-2002, Whangamarino Wetland. NIWA Client Report DOC 00226.

Nichols S.N., Crush J.R. (2000).Pasture quality at three sites sdjacent to the Whangamarino Wetland: March 2000. Agresearch Client Report.

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## Other available references

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Fry R.G. (1976). The Quarternary history of the Reao Arm of the Whangamarino Swamp. Unpublished MSc thesis, University of Waikato, Hamilton, NZ.

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Ogle C.C. and Barlett J.K. (1981). The flora of the Whangamarino Wetlands, Lower Waikao Basin New Zealand. NZ Wildlife Service, Wellington.

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Strachan C. (Ed) (1981). Whangamarino Swamp resources study. Waikato Valley Authority Technical Publication No 20, Hamilton

Strickland R.R. (1980). Fisheries aspects of the Whangamarino Swamp. Fisheries Environmental Report No 7, Ministry of Agriculture and Fisheries, Turangi.