

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).

Notes 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. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

1. Name and address of the Official Respondent:

Joint Nature Conservation Committee

Monkstone House
City Road
Peterborough
Cambridgeshire PE1 1JY
UK
Telephone/Fax: +44 (0)1733 – 562 626 / +44 (0)1733 – 555 948
Email: RIS@JNCC.gov.uk

FOR OFFICE USE ONLY.

DD MM YY

--	--	--

Designation date

--	--	--	--	--	--	--	--

Site Reference Number

Name and address of the compiler of this form:

Updated by UK Overseas Territories Conservation Forum, 102 Broadway, Peterborough,
PE1 4DG, UK

(with assistance from Bermuda Dept. of Conservation Services)

2. Date this sheet was completed/updated:

Designated: 10 May 1999

3. Country:

UK (Bermuda)

4. Name of the Ramsar site:

Warwick Pond

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

This RIS is for: 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:

** 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 included:

Refer to Annex III of the *Explanatory Notes 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) **hard copy** (required for inclusion of site in the Ramsar List): *yes* ✓ -or- *no* □;
- ii) **an electronic format** (e.g. a JPEG or ArcView image)
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** *yes* ✓ -or- *no* □;

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.

The site boundary is the same as, or falls within, an existing protected area.

For precise boundary details, please refer to paper map provided at designation

8. Geographical coordinates (latitude/longitude):

32 16 00 N 64 48 00 W

9. General location:

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

Nearest town/city: Hamilton.

Located adjacent to Middle Road, Warwick Parish, 3 km south-west of Hamilton, bordered by arable land and woodland to the north and east.

Administrative region: Bermuda

10. Elevation (average and/or max. & min.) (metres): **11. Area** (hectares): 2.3

Min.	No information available
Max.	No information available
Mean	0.5

12. General overview of the site:

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

Bermuda's largest freshwater pond with mudflats at the north end and a broad fringing marsh. Important for the only freshwater adapted population of endemic killifish. The most important mudflat for passage of transient shorebirds on Bermuda. Pond also important for resident and migratory waterfowl, e.g. herons, egrets, ducks and rails.

13. 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, 3, 7

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

This is the largest freshwater pond in Bermuda and is a good representative example of a natural small island wetland.

Criterion 3

The seasonal mudflats regularly support 16 species of passage shorebirds. It also supports the only freshwater-adapted population of the endemic killifish *Fundulus bermudae*.

Criterion 7

It supports the only freshwater-adapted population of the endemic killifish *Fundulus bermudae*.

See Sections 21/22 for details of noteworthy species

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:

Bermuda / mid-North Atlantic Islands

b) biogeographic regionalisation scheme (include reference citation):

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.

Soil & geology	mud, nutrient-rich
Geomorphology and landscape	lowland, coastal
Nutrient status	eutrophic
pH	alkaline
Salinity	fresh
Soil	mainly organic
Water permanence	usually permanent
Summary of main climatic features	Subtropical; mild, humid; gales, strong winds common in winter.

General description of the Physical Features:

No information available

17. 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).

A shallow freshwater pond up to 20 cm deep with mudflats at the north end and a broad fringing marsh. There are slight fluctuations in water level associated with the tides.

18. Hydrological values:

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

No special values known

19. Wetland types:

Inland wetland

Code	Name	% Area
------	------	--------

U	Peatlands (including peat bogs swamps, fens)	50
Tp	Freshwater marshes / pools: permanent	40
4	Seasonally flooded agricultural land	10

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.

Open water, some mudflats and *Paspalum/Fimbristylis* marsh. The largest shallow freshwater pond in Bermuda.

Ecosystem services

21. 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.*

Mainly *Paspalum vaginatum* with some *Scirpus americanus* and *Fimbristylis castanea*.

22. 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.*

Birds

Species Information

The endemic killifish *Fundulus bermudae* occurs. This is the only freshwater location where it does so, and it is likely that the form occurring here is unique to the pond.

The mudflats at the north end of the pond are an important feeding area for passage shorebirds, notably: semipalmated plover *Charadrius semipalmatus*, greater yellowlegs *Tringa melanoleuca*, lesser yellowlegs *T. flavipes*, semipalmated sandpiper *Calidris pusilla*, least sandpiper *C. minutilla*, white-rumped sandpiper *C. fuscicollis*, pectoral sandpiper *C. melanotos* and stilt sandpiper *C. himantopus*.

Wintering birds include pied-billed grebe *Podilymbus podiceps*, various herons (Ardeidae), blue-winged teal *Anas discors*, sora rail *Porzana carolina* and American coot *Fulica americana*.

The common moorhen *Gallinula chloropus* breeds on the pond.

23. Social and cultural values:

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.

Environmental education/ interpretation

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? No

If Yes, 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:

Ownership category	On-site	Off-site
Local authority, municipality etc.	+	+
Private		+

25. Current land (including water) use:

Activity	On-site	Off-site
Arable agriculture (unspecified)	+	
Transport route		+
Urban development		+

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

Explanation of reporting category:

1. Those factors that are still operating, but it is unclear if they are under control, as there is a lag in showing the management or regulatory regime to be successful.
2. Those factors that are not currently being managed, or where the regulatory regime appears to have been ineffective so far.

NA = Not Applicable because no factors have been reported.

Adverse Factor Category	Reporting Category	Description of the problem (Newly reported Factors only)	On-Site	Off-Site	Major Impact?
Vegetation succession	1	There has been some encroachment by cattail <i>Typha angustifolia</i> upon the rich mudflats surrounding the pond, especially at the north end. This increased growth has started to reduce the size of the mudflats (an important feeding ground for the passage of migrants, in particular waders or shorebirds). Area covered by <i>Typha</i> increased 300% in 15 years. It is unknown whether this increased growth is due to natural selection, increased nutrient intake and/or a rising water table caused by increasing sea levels.	+	+	+

Pollution – unspecified	1	Possibly the most detrimental factor affecting the water quality at Warwick Pond is extensive run-off of rain water from the closely adjacent Middle Road into the pond. Middle Road is one of the most heavily used roads on Bermuda and is located approximately 17-20 m from the edge of the pond. As other ponds subject to rain run-off have been found to have high levels of hydrocarbon pollutants (especially of the heavy, diesel-family hydrocarbons from vehicular fuel spillage, sump drippings, etc.), it can be assumed that Warwick Pond is no different. The heavy hydrocarbons have been directly implicated in high mortality and deformity rates among toads of marine toads <i>Bufo marinus</i> .	+	+	+

What measures have been taken / are planned / regulatory processes invoked, to mitigate the effect of these factors?

Is the site subject to adverse ecological change? NO

27. 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.

Conservation measure	On-site	Off-site
Land owned by a non-governmental organisation for nature conservation	+	
Other	+	
Management plan in preparation	+	

b) Describe any other current management practices:

Eutrophication - Eutrophication has been tackled to some extent but site is still suffering seasonal eutrophication.

Introduction/invasion of non-native plant species - Some culling of invasive plant species (e.g. *Livistona chinensis* and *Schinus terebinthifolius*) has taken place, with some replanting of endemic trees.

Other - Some culling of invasive plant species (e.g. *Livistona chinensis* and *Schinus terebinthifolius*) has taken place, with some replanting of endemic trees.

28. Conservation measures proposed but not yet implemented:

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

Eutrophication - No further conservation measures are currently proposed.

29. Current scientific research and facilities:

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

A detailed limnological study of the pond was conducted by Dr Martin Thomas.

Migrant bird usage has been monitored and recorded since 1950.

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

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

Some field trips by local schools.

31. Current recreation and tourism:

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

The Bermuda National Trust maintains a nature trail around the pond. An observation hide is proposed.

32. Jurisdiction:

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

Ministry of the Environment

Government of Bermuda, Government House,

Hamilton, Bermuda

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.

Bermuda National Trust, 'Waterville', Paget, PG 05, Bermuda

Also: Conservation (Terrestrial Officer, Dept. of Conservation Services, P.O. Box FL588, Flatts FLBX, Bermuda

34. Bibliographical references:

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

Site-relevant references

Becker, CJ, Shosa, JD & Rueger, BF (2001) A geochemical comparison of Spittal Pond and Warwick Pond, Bermuda. In: *Geological Society of America Abstracts with Program*, **33**(6):A181

Hayward, SJ, Gomez, FH & Sterrer, W (eds.) (1981) *Bermuda's delicate balance: people and environment*. Bermuda National Trust, Paget

Hepburn, I, Oldfield, S & Thompson, K (1992) *UK Dependent Territories Ramsar study: Stage 1*. Unpublished report to Department of the Environment, European and International Habitat Protection Branch, Bristol, from International Waterfowl and Wetlands Research Bureau/ NGO Forum for Nature Conservation in UK Dependent Territories, Slimbridge/ Sandy (Research contract, No. 7/2/126)

Pienkowski, M (ed.) (2003) *A sense of direction: a conference on conservation in UK Overseas Territories and other small island communities, Bermuda 22nd–27th March 2003*. UK Overseas Territories Conservation Forum, Peterborough. www.ukotcf.org

Pienkowski, MW (ed.) (2005) *Review of existing and potential Ramsar sites in UK Overseas Territories and Crown Dependencies*. (Contractor: UK Overseas Territories Conservation Forum, Peterborough.) Final report on Contract CR0294 to the UK Department for Environment, Food and Rural Affairs, Bristol. www.ukotcf.org

Proctor, D & Fleming, LV (eds.) (1999) *Biodiversity: the UK Overseas Territories*. Joint Nature Conservation Committee, Peterborough

Scott, DA & Carbonell, M (eds.) (1986) *A directory of neotropical wetlands*. IUCN/IWRB, Cambridge/Slimbridge

Wingate, DB (1984) *Taking stock of Bermuda's wetland heritage*. Department of Agriculture and Fisheries, Hamilton

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