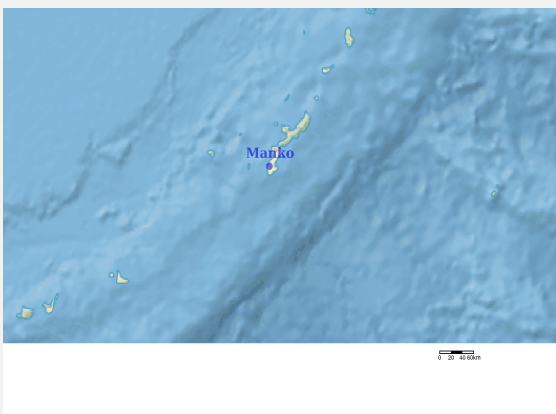




Ramsar Information Sheet

Update version, previously published on 15 May 1999

Japan Manko



Designation date	15 May 1999
Site number	996
Coordinates	26°11'44"N 127°41'5"E
Area	58,00 ha

Color codes

Fields back-shaded in light blue relate to data and information required only for RIS updates.

Note that some fields concerning aspects of Part 3, the Ecological Character Description of the RIS (tinted in purple), are not expected to be completed as part of a standard RIS, but are included for completeness so as to provide the requested consistency between the RIS and the format of a 'full' Ecological Character Description, as adopted in Resolution X.15 (2008). If a Contracting Party does have information available that is relevant to these fields (for example from a national format Ecological Character Description) it may, if it wishes to, include information in these additional fields.

1 - Summary

Summary

Manko is an estuary tidal flat which is formed at the meeting point of the Kokuba River flowing in Naha City and Noha River flowing in Tomigusuku City. It is located 3 kilometers upstream inland and is affected by tidal fluctuations. A maximum of 47 hectares of mudflat appears at low tide. This site is an important stop-over place for migratory waterbirds because there are abundant juvenile fishes and benthos, such as fries or lugworms which are specific to blackish tidal flat. Many shorebirds, such as Pacific Golden Plover (*Pluvialis fulva*), Dunlin (*Calidris alpina*) and Eurasian Curlew (*Numenius arquata*) are often observed. Threatened and vulnerable species such as Black-faced Spoonbill (*Platalea minor*), Far Eastern Curlew (*Numenius madagascariensis*) and Saunder's Gull (*Larus saundersi*) are also observed.

2 - Data & location

2.1 - Formal data

2.1.1 - Name and address of the compiler of this RIS

Name	Mr. Manabu Nishimura
Institution/agency	Naha Nature Conservation Office, Kyushu Regional Environmental Office, Ministry of the Environment
Postal address	1-15-15, Higawa, Naha-shi, Okinawa-ken, 900-0022, JAPAN
E-mail	NCO-NAHA@env.go.jp
Phone	+81-98-836-6400
Fax	+81-98-836-6401

2.1.2 - Period of collection of data and information used to compile the RIS

From year	2005
To year	2014

2.1.3 - Name of the Ramsar Site

Official name (in English, French or Spanish)	Manko
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2.1.4 - Changes to the boundaries and area of the Site since its designation or earlier update

(Update) A. Changes to Site boundary Yes No

(Update) B. Changes to Site area No change to area

2.1.5 - Changes to the ecological character of the Site

(Update) 6b i. Has the ecological character of the Ramsar Site (including applicable Criteria) changed since the previous RIS? Yes (actual)

(Update) Are the changes Positive Negative Positive & Negative

(Update) Changes resulting from causes operating beyond the site's boundaries?

(Update) Please describe any changes to the ecological character of the Ramsar Site, including in the application of the Criteria, since the previous RIS for the site.

Criterion 6 is no longer applicable because the estimated population size of Black-faced Spoonbill (Platalea minor) has been continuously increasing and therefore the number of Black-faced Spoonbills at Manko now falls below 1% of its current population size.

(Update) Is the change in ecological character negative, human-induced AND a significant change (above the limit of acceptable change) Yes

2.2 - Site location

2.2.1 - Defining the Site boundaries

b) Digital map/image

<1 file(s) uploaded>

Boundaries description (optional)

Boundary of Manko is the same as that of the Special Protection Area within the Manko National Wildlife Protection Area, following the boundaries of the roads and the rivers.

2.2.2 - General location

a) In which large administrative region does the site lie? Naha City and Tomigusuku City, Okinawa Prefecture

b) What is the nearest town or population centre? The Center of Naha City, Okinawa Prefecture

2.2.3 - For wetlands on national boundaries only

a) Does the wetland extend onto the territory of one or more other countries? Yes No

b) Is the site adjacent to another designated Ramsar Site on the territory of another Contracting Party? Yes No

2.2.4 - Area of the Site

Official area, in hectares (ha):

Area, in hectares (ha) as calculated from GIS boundaries

2.2.5 - Biogeography

Biogeographic regions

Regionalisation scheme(s)	Biogeographic region
Udvardy's Biogeographical Provinces	The Palaearctic Realm, Ryukyu islands, Mixed island System

3 - Why is the Site important?

3.1 - Ramsar Criteria and their justification

- Criterion 2 : Rare species and threatened ecological communities
- Criterion 4 : Support during critical life cycle stage or in adverse conditions

3.2 - Plant species whose presence relates to the international importance of the site

<no data available>

3.3 - Animal species whose presence relates to the international importance of the site

Phylum	Scientific name	Common name	Species qualifies under criterion				Species contributes under criterion				Pop. Size	Period of pop. Est.	% occurrence	IUCN Red List	CITES Appendix I	CMS Appendix I	Other Status	Justification
			2	4	6	9	3	5	7	8								
CHORDATA / AVES	<i>Chroicocephalus saundersi</i>	Saunders's Gull	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				VU 	<input type="checkbox"/>	<input type="checkbox"/>	VU on Japan Red List	A key staging site
CHORDATA / AVES	<i>Falco peregrinus</i>	Peregrine Falcon	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input checked="" type="checkbox"/>	<input type="checkbox"/>	VU on Japan Red List, Nationally Endangered Species (the Law for the Conservation of Endangered Species of Wild Fauna and Flora, the Government of Japan)	
CHORDATA / AVES	<i>Numerius madagascariensis</i>	Eastern Curlew; Far Eastern Curlew	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	VU on Japan Red List	A key staging site
CHORDATA / AVES	<i>Platalea minor</i>	Black-faced Spoonbill	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				EN 	<input type="checkbox"/>	<input checked="" type="checkbox"/>	EN on Japan Red List,	A key staging site
CHORDATA / AVES	<i>Sternula albifrons</i>	Little Tern	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				LC 	<input type="checkbox"/>	<input type="checkbox"/>	VU on Japan Red List, International Endangered Species (the Law for the Conservation of Endangered Species of Wild Fauna and Flora, the Government of Japan)	

3.4 - Ecological communities whose presence relates to the international importance of the site

<no data available>

4 - What is the Site like? (Ecological character description)

4.1 - Ecological character

This brackish tidal flat is located approximately 3 kilometers upstream from the mouth of two rivers, lined by mangroves mostly consisted of *Kandelia ovobata*. Mangroves cover approximately 7 hectares. The climate is warm and constant with no distinct seasonal changes, but the mangrove trees bloom and/or produce viviparous seeds during spring and summer. The mudflats exposed at low tide are the habitat for an abundance of benthos and fishes, including crabs, lugworms, gray mullets and tilapias, which provide the birds with food.

4.2 - What wetland type(s) are in the site?

Marine or coastal wetlands

Wetland types (code and name)	Local name	Ranking of extent (1: greatest - 4: least)	Area (ha) of wetland type	Justification of Criterion 1
F: Estuarine waters		1	30	
G: Intertidal mud, sand or salt flats		2	28	

4.3 - Biological components

4.3.1 - Plant species

Other noteworthy plant species

Scientific name	Common name	Position in range / endemism / other
<i>Bruguiera gymnorhiza</i>		
<i>Kandelia ovobata</i>		
<i>Rhizophora mucronata</i>		

4.3.2 - Animal species

Other noteworthy animal species

Phylum	Scientific name	Common name	Pop. size	Period of pop. est.	% occurrence	Position in range / endemism / other
CHORDATA/ACTINOPTERYGII	<i>Acentrogobius viridipunctatus</i>					VU on Japan Red List
MOLLUSCA/GASTROPODA	<i>Auriculodes incrassatum</i>					CR on Japan Red List
MOLLUSCA/GASTROPODA	<i>Blauneria quadrasi</i>					VU on Japan Red List
CHORDATA/AVES	<i>Butastur indicus</i>	Grey-faced Buzzard				VU on Japan Red List
CHORDATA/AVES	<i>Charadrius alexandrinus</i>	Kentish Plover; Snowy Plover				VU on Japan Red List
ARTHROPODA/INSECTA	<i>Cybister tripunctatus lateralis</i>					VU on Japan Red List
CHORDATA/AVES	<i>Himantopus himantopus</i>	Black-winged Stilt				VU on Japan Red List
CHORDATA/REPTILIA	<i>Japalura polygonata polygonata</i>					VU on Japan Red List
MOLLUSCA/GASTROPODA	<i>Laemodonta siamensis</i>					VU on Japan Red List
CHORDATA/AVES	<i>Lanius cristatus</i>	Brown Shrike				EN on Japan Red List
CHORDATA/AVES	<i>Pericrocotus divaricatus</i>	Ashy Minivet				VU on Japan Red List
CHORDATA/REPTILIA	<i>Plestiodon marginatus marginatus</i>					VU on Japan Red List
CHORDATA/AVES	<i>Tadorna tadorna</i>	Common Shelduck				VU on Japan Red List
CHORDATA/ACTINOPTERYGII	<i>Taenioides cirratus</i>					EN on Japan Red List
CHORDATA/ACTINOPTERYGII	<i>Taenioides limicola</i>					VU on Japan Red List
CHORDATA/AVES	<i>Tringa totanus eurhina</i>	Common Redshank				VU on Japan Red List

4.4 - Physical components

4.4.1 - Climate

Climatic region	Subregion
C: Moist Mid-Latitude climate with mild winters	Cfa: Humid subtropical (Mild with no dry season, hot summer)

More on climate: Average temperature is 22.3 degrees Celsius. Annual rainfall is 2087.1 mm (average from 1891 to 2011).

4.4.2 - Geomorphic setting

RIS for Site no. 996, Manko, Japan

a) Minimum elevation above sea level (in metres)

a) Maximum elevation above sea level (in metres)

More than one river basin

Coastal

Please name the river basin or basins. If the site lies in a sub-basin, please also name the larger river basin. For a coastal/marine site, please name the sea or ocean. **Manko is an estuary tidal flat which is formed at the meeting point of the Kokuba River flowing in Naha City and Noha River flowing in Tomigusuku City. It is located 3km upstream inland and affected by tidal fluctuations.**

4.4.3 - Soil

Mineral

(Update) Changes at RIS update No change Increase Decrease Unknown

Organic

(Update) Changes at RIS update No change Increase Decrease Unknown

No available information

Are soil types subject to change as a result of changing hydrological conditions (e.g., increased salinity or acidification)? Yes No

Please provide further information on the soil (optional) **Soil type is mainly clay (montmorillonite illite, kaolinite).**

4.4.4 - Water regime

Water permanence

Presence?	Changes at RIS update
Usually permanent water present	No change

Source of water that maintains character of the site

Presence?	Predominant water source	Changes at RIS update
Water inputs from surface water	<input checked="" type="checkbox"/>	No change
Marine water	<input checked="" type="checkbox"/>	No change

Water destination

Presence?	Changes at RIS update
Marine	No change

Stability of water regime

Presence?	Changes at RIS update
Water levels fluctuating (including tidal)	No change

Please add any comments on the water regime and its determinants (if relevant). Use this box to explain sites with complex hydrology. **Water depth is 2 m at the average tidal level. Tidal variation: Average tidal level alt. 5.2 cm, average high tidal level alt. 98 cm, average low tidal level alt. -111.8 cm (at Naha part, from 2006 to 2010). Hydrology: Inflow and outflow 326,061 m³/day (March 12 - 13, 1998).**

4.4.5 - Sediment regime

(Update) Changes at RIS update No change Increase Decrease Unknown

(Update) Changes at RIS update No change Increase Decrease Unknown

(Update) Changes at RIS update No change Increase Decrease Unknown

(Update) Changes at RIS update No change Increase Decrease Unknown

Sediment regime unknown

Please provide further information on sediment (optional): **An alluvium of Holocene sediment is ranged in this area and local Ryuku limestones are also found. The alluvium along Kokuba River is vast and some of the layers are around 15 to 20 m thick.**

4.4.6 - Water pH

(Update) Changes at RIS update No change Increase Decrease Unknown

(Update) Changes at RIS update No change Increase Decrease Unknown

Alkaline (pH>7.4)

(Update) Changes at RIS update No change Increase Decrease Unknown

Please provide further information on pH (optional): **pH 7.2 - 8.1 (at Naha Ohashi Bridge, 2010).**

4.4.7 - Water salinity

Mxohaline (brackish)/Mxosaline (0.5-30 g/l)

(EOD) Dissolved gases in water **DO 3.6 - 6.5 mg/L (at Naha Ohashi Bridge, 2010).**

4.4.8 - Dissolved or suspended nutrients in water

Eutrophic

(ECD) Dissolved organic carbon BOD < 0.5 - 2.9 mg/L (at Naha Ohashi Bridge, 2010).

4.4.9 - Features of the surrounding area which may affect the Site

Please describe whether, and if so how, the landscape and ecological characteristics in the area surrounding the Ramsar Site differ from the i) broadly similar ii) significantly different site itself:

Surrounding area has greater urbanisation or development

Surrounding area has higher human population density

Surrounding area has more intensive agricultural use

Please describe other ways in which the surrounding area is different:

The upstream part and middle stream part of the catchment area are agricultural fields and the downstream part is mostly cities. The catchment is covered with Shimajiri layer mudstones and the Jahgaru soil which is made by weathering of the mudstones distributed widely over the catchment. The climate in the catchment area is the same as Manko and its surrounding areas. The mean annual rainfall in the catchment is ca.1,900mm. Regarding geographical features, there are mostly rolling hills with less than 100m difference of elevation, and most of the rainwater flows into rivers because there are few areas to accumulate rainwater on the ground.

4.5 - Ecosystem services

4.5.1 - Ecosystem services/benefits

Provisioning Services

Ecosystem service	Examples	Importance/Extent/Significance
Food for humans	Sustenance for humans (e.g., fish, molluscs, grains)	Medium

Regulating Services

Ecosystem service	Examples	Importance/Extent/Significance
Erosion protection	Soil, sediment and nutrient retention	Medium

Cultural Services

Ecosystem service	Examples	Importance/Extent/Significance
Recreation and tourism	Nature observation and nature-based tourism	
Scientific and educational	Educational activities and opportunities	Medium
Scientific and educational	Important knowledge systems, importance for research (scientific reference area or site)	
Scientific and educational	Major scientific study site	

Supporting Services

Ecosystem service	Examples	Importance/Extent/Significance
Biodiversity	Supports a variety of all life forms including plants, animals and microorganisms, the genes they contain, and the ecosystems of which they form a part	Medium

Other ecosystem service(s) not included above: More on Provisioning services: Fisheries of mangrove crabs, *Scylla serrata* and *Scylla olivacea*, are conducted here for livelihoods in an inland water area.

Have studies or assessments been made of the economic valuation of ecosystem services provided by this Ramsar Site? Yes No Unknown

4.5.2 - Social and cultural values

<no data available>

4.6 - Ecological processes

<no data available>

5 - How is the Site managed? (Conservation and management)

5.1 - Land tenure and responsibilities (Managers)

5.1.1 - Land tenure/ownership

Public ownership

Category	Within the Ramsar Site	In the surrounding area
Provincial/region/state government	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Local authority, municipality, (sub)district, etc.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Public land (unspecified)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Private ownership

Category	Within the Ramsar Site	In the surrounding area
Other types of private/individual owner(s)	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Provide further information on the land tenure / ownership regime (optional):

The whole area of the Ramsar Site is public water.

5.1.2 - Management authority

Please list the local office / offices of any agency or organization responsible for managing the site:

Naha Nature Conservation Office, Kyushu Regional Environmental Office, Ministry of the Environment

Provide the name and title of the person or people with responsibility for the wetland:

Mr. Manabu Nishimura

Postal address:

1-15-15, Higawa, Naha-shi, Okinawa-ken, 900-0022, JAPAN.
Tel: +81-98-836-6400, Fax: +81-98-836-6401

E-mail address:

NCO-NAHA@env.go.jp

5.2 - Ecological character threats and responses (Management)

5.2.1 - Factors (actual or likely) adversely affecting the Site's ecological character

Human settlements (non agricultural)

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Housing and urban areas	Medium impact		<input type="checkbox"/>	No change	<input checked="" type="checkbox"/>	unknown

Transportation and service corridors

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Roads and railroads	Medium impact	Medium impact	<input type="checkbox"/>	unknown	<input checked="" type="checkbox"/>	unknown

Natural system modifications

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Vegetation clearance/land conversion	Medium impact		<input checked="" type="checkbox"/>	unknown	<input checked="" type="checkbox"/>	unknown

Invasive and other problematic species and genes

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Problematic native species	High impact		<input checked="" type="checkbox"/>	increase	<input type="checkbox"/>	No change

Pollution

Factors adversely affecting site	Actual threat	Potential threat	Within the site	Changes	In the surrounding area	Changes
Garbage and solid waste	Medium impact		<input checked="" type="checkbox"/>	unknown	<input type="checkbox"/>	No change

Please describe any other threats (optional):

More on vegetation clearance/land conversion:
- Rapid expansion of afforested mangrove and parching of tidal flat by sediment within the Ramsar Site.

5.2.2 - Legal conservation status

National legal designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Special Protection Area of National Wildlife Protection Area	Manko Special Protection Area within Manko National Wildlife Protection Area		whole

Non-statutory designations

Designation type	Name of area	Online information url	Overlap with Ramsar Site
Important Bird Area	Manko tidal flat		whole
Other non-statutory designation	Manko (500 important wetlands in Japan(2002))		whole

5.2.3 - IUCN protected areas categories (2008)

IV Habitat/Species Management Area: protected area managed mainly for conservation through management intervention

5.2.4 - Key conservation measures

Legal protection

Measures	Status
Legal protection	Implemented

Human Activities

Measures	Status
Harvest controls/poaching enforcement	Implemented
Communication, education, and participation and awareness activities	Implemented
Research	Implemented

Other:

More on legal protection: Manko is designated as Special Wildlife Protection Area under the "Law for the Protection of Birds and Mammals and Hunting" of Japan. In this area, capture of wild birds and mammals, installation of artificial structures, reclamation of water body, and tree logging are prohibited without permission by the Minister of the Environment, Japan.

5.2.5 - Management planning

Is there a site-specific management plan for the site? Yes

Has a management effectiveness assessment been undertaken for the site? Yes No

If the site is a formal transboundary site as indicated in section Data and location > Site location, are there shared management planning processes with another Contracting Party? Yes No

Please indicate if a Ramsar centre, other educational or visitor facility, or an educational or visitor programme is associated with the site:

There is "Manko Waterbird and Wetland Center" next to the site. Students from the mainland of Japan visit the center as part of school trip;
 Manko Churakagi (cleaning) Event for general public (once a year) including cleaning activities and nature observation programs: 100–200 participants;
 Kokuba River Mizu Ashibi Event for general public (once a year) including cleaning activities and nature observation programs: ca.160 participants;
 Workshop for wise use of Manko by Manko Natural Environment and Conservation Liaison Council;
 Environmental Meeting by Children in Okinawa (once a year) participated by ca.20 children who take part in conservation activities in Ramsar sites of Okinawa;
 Bird watching and nature observation programs of benthos such as fishes or crabs in mud with interpretation by experts, experience-based water quality survey, dyeing program using mangrove, lectures on nature and sampling of live creatures for parents and their children, etc. are often conducted.

5.2.6 - Planning for restoration

Is there a site-specific restoration plan? Yes, there is a plan

5.2.7 - Monitoring implemented or proposed

Monitoring	Status
Plant community	Implemented
Animal community	Implemented
Birds	Implemented

6 - Additional material

6.1 - Additional reports and documents

6.1.1 - Bibliographical references

2012 Measurement result of water quality, Okinawa Prefecture
2007 Revised plan of official Manko Wildlife Protection Area, Ministry of the Environment, Japan
2005 Revised Red Data Okinawa, threatened wildlife in Okinawa Prefecture, Okinawa Prefecture
2008 Report of Conservation project examination and survey in Manko National Wildlife Protection Area, Ministry of the Environment, Japan

6.1.2 - Additional reports and documents

i. taxonomic lists of plant and animal species occurring in the site (see section 4.3)

<no file available>

ii. a detailed Ecological Character Description (ECD) (in a national format)

<no file available>

iii. a description of the site in a national or regional wetland inventory

<no file available>

iv. relevant Article 3.2 reports

<no file available>

v. site management plan

<no file available>

vi. other published literature

<no file available>

6.1.3 - Photograph(s) of the Site

Please provide at least one photograph of the site:



Manko from Haryu Bridge (
*Ministry of Environment, the
Government of Japan, 20-12-
2005*)



Manko from Toyomi Bridge (
*Ministry of Environment, the
Government of Japan, 02-02-
2006*)

6.1.4 - Designation letter and related data

Designation letter

<no file available>

Transboundary Designation letter

<no file available>

Date of Designation 1999-05-15