

Information Sheet on Ramsar Wetlands (RIS)

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Designation date

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Site Reference Number

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2. Date this sheet was completed: January 20, 2005

3. Country: Jamaica

4. Name of the Ramsar site: Portland Bight Wetlands and Cays

5. Map of site included: Yes

a) **Hard copy:** Yes

b) **Digital (electronic) format:** yes

6. Geographical coordinates (centre): 17° 49' N, 77° 04' W

7. General location:

The Portland Bight Protected Area (PBPA) is centrally located on the south coast of the island of Jamaica, just west of the capital city, Kingston. The PBPA includes the southern portions of the civil parishes of St. Catherine and Clarendon, each of which is governed by a Parish Council. Its northern boundary is due south of both Spanish Town (5 km) and May Pen (3 km). The major towns included within the PBPA are Lionel Town and Hayes in Clarendon, and Old Harbour Bay in St. Catherine. The population within the PBPA is approximately 50,000 persons. The proposed Ramsar site is 24.542 ha and is entirely enclosed by this protected area which is 197,320 ha representing approximately 12.4 % of the total protected area.

8. Elevation: Minimum: Sea Level (+/- 20m Below Sea Level).
Average: Sea level.
Maximum: 10 metres above sea level.

9. Area: The proposed Ramsar site has an area of 24.542 ha, while the whole PBPA has an area of 197,320 ha.

10. Overview:

The terrestrial portion of the PBPA includes the immediate watershed above the bight, which consists of four dry limestone forests (210.3 km²), extensive areas under sugar cultivation and over forty residential communities. The Ramsar site represents a largely undisturbed coastal area with extensive mangrove wetlands stretching over approximately 82 km² (among the largest contiguous mangrove stands remaining in Jamaica). A small salt marsh, several rivers, offshore cays (small islands), coral reefs and sea grass beds are also found on the shallow island shelf.

11. Ramsar Criteria:

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
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12. Justification for the application of each Criterion listed in 11.

Criterion 1: Portland Bight includes 8,200 ha of wetlands, mostly coastal mangroves, among the largest contiguous mangrove stands remaining in Jamaica, and also includes a good example of a salt marsh. The dominant species in the mangroves are red mangroves (*Rhizophora mangle*), black mangroves (*Avicennia germinans*), white mangroves (*Laguncularia racemosa*) and buttonwood mangroves (*Conocarpus erectus*). The dominant species in the salt marsh are *Typha domingensis* and *Phragmites australis*.

Criterion 2: The proposed Portland Bight Ramsar site constitutes a critical feeding and breeding location as well as a general habitat for the following internationally threatened species: green turtle (*Chelonia mydas*), endangered according to the IUCN Red List, and CITES Appendix I; the American crocodile (*Crocodylus acutus*), IUCN vulnerable and CITES App. II; the West Indian Whistling Duck (*Dendrocygna arborea*), IUCN vulnerable and CITES App. II; the cave frog (*Eleutherodactylus cavernicola*), IUCN critically endangered; the Jamaican Boa (*Epicrates subflavus*), IUCN vulnerable and CITES App. I; the Hawksbill Turtle (*Eretmochelys imbricata*), IUCN critically endangered and CITES App. I; the endemic hutia or coney (*Geocapromys brownii*), vulnerable according to IUCN; and the West Indian manatee (*Trichechus manatus manatus*), IUCN vulnerable and CITES App. I. As regards the local flora, only an endemic cactus (*Opuntia jamaicensis*) is included in CITES Appendix II.

Criterion 3: The Portland Bight wetlands have been identified as of regional significance in Sullivan et al. (1999). They include habitats for a wide range of endemic and rare plants and animals, including rare endemic species such as the aquatic plants (*Isoetes jamaicensis*) known only from the *type locality* in Portland Bight, and several endemic freshwater fish including *Gambusia wrayi* (Caldwell, 1966) *Limia melanogaster* (Lee, et al., 1983).

Criterion 4: The permanent pools and mangroves provide important refuges for wetland species (including American Crocodiles (*Crocodylus acutus*) and West Indian Whistling Ducks (*Dendrocygna arborea*) during times of drought.

13. Biogeography:

- a) **biogeographic region:** Jamaica falls in the Neotropical Biogeographical Region.
- b) **biogeographic regionalisation scheme:** Global Biogeographical Regional System (Hedges, 1999).

14. Physical features of the site:

- **Geology and Geomorphology:** The underlying geology is karst limestone, overlaid by alluvium in the coastal plains. There are pockets of peat in some wetlands. A major fault (the south coast fault), passes through the area. There are 53 known caves. There are fourteen small coral cays in the waters of the Bight, two karst limestone islands and numerous mangrove islands.

- **Soil Type & Chemistry:** The four dry limestone forests are karst limestone. The floodplains in between are sedimentary, and have been intensively cultivated with sugar cane for the last 400 years. The water used for irrigation is slightly saline. The fertilizer used on sugar cane is primarily ammonium phosphate. The soil on the floodplain is alkaline.
- **Origins:** The wetlands are mostly natural in origin, although some have been substantially modified by human activities, including drainage for agriculture, construction of fish and shrimp farms and solar salt pans.
- **Hydrology:** The hydrology is complex. The wetlands lie in the floodplain of the Rio Minho but there are many small rivers, streams and springs. The drainage patterns have been significantly altered by drainage and irrigation to create and maintain sugarcane plantations. There are many freshwater springs in the wetlands and offshore, including a group of mineral springs with reputed therapeutic properties.
- **Water Quality:** Because of the north-south fault and over-pumping to supply the sugar cane, the aquifers suffer from saline intrusion. Levels of nutrients (nitrates, phosphates) are elevated due to agricultural runoff.
- **Water Depth:** The depth of water in the mangroves and in the salt marshes ranges from less than a metre to several metres. The seaward boundary of the proposed Ramsar Site except for where it passes the coral and mangrove cays is the twenty (20) metre depth contour. While it is noted that the stated depth for Ramsar designation is 6 (m), the stated contour was used as it allowed for a definable boundary between the cays (that is makes the area contiguous) that would otherwise have been impossible due to the depth of water between these cays in some instances. It should also be noted that there are several lagoons in the interior portions of the wetland and in those areas the freshwater and the vegetation are dominated by herbaceous wetland species (*Phragmites sp. and Typha sp.*), the depth of the water here varies significantly and is habitat for several species of fish, birds and the American crocodile.
- **Water Permanence and Fluctuations in Water Levels:** Most of the wetlands are maintained by tidal flows and rainfall, but some dry out seasonally, or in exceptionally dry conditions (e.g. Salt Island Lagoon, the wetland behind Coquhar-Manatee Bay).
- **Tidal Variations:** Jamaica has relatively small tidal amplitude, with a maximum highest high to lowest low of approx. 0.8 metre.
- **Catchment Area:** The catchment area for the western part of the PBPA is the watershed of the Rio Minho, Jamaica's longest river. The catchment area for the eastern part of the PBPA is the relatively small watershed of Salt Island Creek.
- **Downstream Area:** As the PBPA is on the coast, the downstream areas are further along the coast to the west, the direction of the sea currents.
- **Climate:** The thirty-year average annual rainfall varies between 886-1052 mm/a with a bimodal seasonal effect that is typical of Jamaica. The wettest months are May-June and August-November. Rainfall increases from east to west and south to north. The mean minimum and maximum temperatures range between 18.3°C and 30.8°C respectively (January) and 22.4°C and 33.0°C respectively (September). Hurricanes rarely directly affect this part of the coastline.

15. Physical features of the catchment area:

- **Surface Area:** Approximately 1097.9 km²
- **General Geological and Geomorphological features:** predominantly white limestone
- **General Land Use:** In the Rio Minho and Salt Island catchment areas the major land uses are agricultural and residential, with some commercial activity close to large towns, and industries such as large farms and rivers (sand mining).
- **Climate (including characterisation of climate type):** The previous description above applies

16. Hydrological values:

The hydrological values of the wetlands have not been assessed in detail.

- **Sediment Trapping:** The wetlands play an important role in trapping sediments from the hinterland, thus protecting coral reefs and sea grass beds.
- **Shoreline Stabilization:** The wetlands are very important in stabilizing shorelines. About one tenth of Jamaica’s coastline is included in the Portland Bight Protected Area and most of it is fringed with mangroves. Historical evidence suggests that most of the coast is stable or accreting. This represents a major contribution to the protection of the ecology of the area and up-current localities.
- **Water Purification and Maintenance of Water Quality:** The large expanses of mangroves strip most of the nutrients from the surface water, but several submarine springs deliver nutrient-rich water directly onto the coastal shelf.

17. Wetland Types

a) presence:

Marine/coastal:

<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>G</u>	<u>H</u>	<u>I</u>	<u>J</u>	<u>K</u>	<u>Zk(a)</u>
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Inland:

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

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>Zk(c)</u>
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b) dominance:

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

Inland: M, N, Zk(b), Y

Human-made: 3, 9, 1, 2, 8, 5

18. General ecological features:

- **Mangroves:** The wetlands are typically dominated by mangroves. The typical zonation is shown, from coral reefs, to sea grass beds (dominated by *Thalassia testudinum*), to the four types of mangroves mentioned previously. There are several large lagoon systems and many miles of fringe mangroves.
- **Coastal woodland** of various types, including cactus-thorn scrub, and various secondary formations are found behind the wetlands.
- **Beaches:** In some areas, there are wide white or black sandy or pebbly beaches, and wooded berms (sand bar behind high-water fronting wetlands) separates the wetland from the sea.
- **Rocky shores:** In other places the coast is rocky and there is no wetland.
- **Herbaceous wetlands:** dominated by sedges (including *Cladium jamaicensis*, *Typha domingensis* and *Phragmites australis*) are present but relatively uncommon.
- **Islands and cays:** There are two large karst limestone islands, fourteen small coral cays and numerous mangrove islets. Many are mangrove-fringed or include mangrove lagoons.
- **Coral reefs:** Coral reefs are mostly patch reefs.
- **Sea grass beds:** There are extensive sea grass beds mostly dominated by *Thalassia testudinum*.

19. Noteworthy flora:

Noteworthy flora include rare and local plant species such as the aquatic fern *Isoetes jamaicensis*, known only from one small area – its natural habitat is in seasonal wetlands in Portland Bight. A rare endemic cactus (*Opuntia jamaicensis*) found in a few places close to mangrove swamps. The

dry forests support at least 271 species of plants of which 53 (19.6%) are endemic to Jamaica (Woodley, 1970).

20. Noteworthy fauna:

Noteworthy fauna include:

➤ Mammals

- The West Indian Manatee (*Trichechus manatus manatus*), once common, is now rare.
- The many caves are habitat to a number of native species of bats including the fish-eating bat (*Noctilio leporinus*) which is found only in one cave in the Hellshire Hills.
- The dry limestone forests are habitat to the endemic hutia or coney (*Geocapromys brownii*).

➤ Birds

Internationally significant numbers of migrant and resident waterbirds, such as:

- Endemic species and sub-species (specially the rare endemic sub-species Plain Pigeon *Columba inornata exigua*, whose only known wintering habitat is in Portland Bight).
- Seabirds including Least Terns (*Sterna antillarum*) and Roseate Terns (*Sterna dougalli*).
- Large numbers of migrant landbirds: e.g. Northern Waterthrush (*Seiurus noveboracensis*).
- Threatened species: West Indian Whistling Duck (*Dendrocygna arborea*).
- Species of economic importance: Game birds including White-crowned Pigeon *Columba leucocephala*, White-winged Dove *Zenaida asiatica* & Mourning Dove *Zenaida macroura*.

➤ Reptiles and amphibians

- Endangered species: American Crocodile (*Crocodylus acutus*), Hawksbill Turtle (*Eretmochelys imbricata*), Green turtle (*Chelonia mydas*).
- A further seven (7) endemic species of amphibians and reptiles found in the dry forests are considered to be threatened (Vogel 1998): the Jamaican Iguana (*Cyclura collei*), the Blue-Tailed Galliwasp (*Celestus duquesneyi*), the cave frog (*Eleutherodactylus cavernicola*), the skink (*Mabouya mabouya*) the Jamaican Boa (*Epicrates subflavus*) and the Thunder Snakes (*Trophidophis stullae* and *Trophidophis jamaicensis*).

➤ Fishable resources

The finfish, mollusc and crustacean populations of Portland Bight are of outstanding economic importance.

21. Social and cultural values:

- Social values: The wetlands are mainly used for commercial and sport fishing. Fishing in the wetlands is largely artisanal. Columbidae hunting is a popular sport for wealthy visitors to the area in season and provides some employment.

VALUES	ACTIVITIES	ECONOMIC IMPORTANCE	IMPACTS
SOCIAL	Fishing (mostly finfish)	Major	Removal of some of the biodiversity from the area, while it is believed that the fishing industry in Jamaica is currently unsustainable. CCAM, Fisheries Division and NEPA are currently working at improving the practices in an effort to enhance sustainability. This activity also provides the major source of income for most of the coastal communities in the area.
	Outdoor recreation and tourism (sport hunting & fishing,	Minor	The hunting in the area as in Jamaica as a whole is done according to a hunting season with limits on bag. While entirely effective this is a move in the right direction especially as the quotas and seasons are modified

	bathing, boat trips)		annually based on scientific research on populations. Over-exploitation is probably reducing forest regeneration capacity.
	Agriculture (mostly sugar)	Major	Agricultural run off and sugar wastes contribute to marine pollution, but alternative disposal mechanisms are being explored with a view to making this activity less destructive.
	Fish and shrimp farming	Moderate	Many abandoned farms. However, there has been significant recent expansion of shrimp farms in the area. This has increased the income of some members of the communities, and if properly managed has the potential to reduce the effort being applied to the harvesting of marine resources through income substitution. The farms are governed by environmental permits which also seek to ensure the protection of wetland species, particularly crocodiles.
	Education/ research	Very Minor	The potential of the area is currently under exploited .
	Industry	Moderate and likely to expand	Existing: Two bauxite ports, bauxite plant, limestone quarry and processing, two power stations, a solar salt factory, a paper processing plant, textile mill and feed mill. Pollution is not a major problem, but there are occasional oil spills.
	Housing	Minor	Existing: New housing estate being built. Proposed: New town would provide additional housing for residents, and provides the possibility of increased incomes for the people. It would however hold the potential to disrupt the watershed, coastal water balance, wetlands and fisheries if not properly implemented.
CULTURAL	History	Little known	Many important and interesting sites, from every phase of Jamaica's history, but they are little known or appreciated
	Religion	Minor	No known sites of religious importance.

22. Land tenure/ownership:

(a) **Within the Ramsar Site:** The wetlands and the dry forests are owned mainly by the government and government-owned companies. Large blocks of the coastal plains are owned by the government and are operated as sugar estates. Around the villages and towns there are large numbers of small-holders.

(b) In the Surrounding Area:

The land surrounding the portions of the protected area being designated as a Ramsar site are owned by private land owners, the Commissioner of Lands (on behalf of the people of Jamaica) and the Urban Development Corporation (a quasi government organization charged with the development of its land holdings).

23. Current land (including water) use:

(a) Within the Ramsar Site:

- **Fishing:** More than 3,000 fishers and their families make their living in Portland Bight, harvesting mostly finfish, but also lobster, shrimp, oysters and conch.

- **Irrigation:** water is extracted from springs in coastal wetlands to irrigate sugar plantations.
- **Aquaculture:** Fish (Tilapia) and shrimp (Macrobrachium) farms, several now abandoned.
- **Heavy Industry:** see above.
- **Agriculture:** The surrounding area is arguably one of the most important sugar producing areas in the country. An unknown number of cattle and goats are grazed on an *ad hoc* basis mostly by people who do not own land. Additionally there is some subsistence farming in areas of the proposed site.
- **Forestry:** There are two forest reserves: Hellshire Hills (dry limestone forest) and Peake Bay (mangroves). Cultivated forestry is restricted to a few small trial plots.
- **Hunting:** Sport hunting for columbids, this is a seasonal activity that lasts on average for six weeks each year. This activity is managed by the National Environment and Planning Agency and is done based on surveys to determine the ability of the population to support the activity. Duck hunting has been proposed but has not been approved by NEPA as it could threaten not only the rare whistling duck populations but also the populations of other ducks.

(b) In the Surrounding Area/Catchment:

- Agriculture: sugar and small farming.
- Expanding urban and residential areas.

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:

➤ Overexploitation:

- Overfishing and bad fishing practices.
- Non compliance with bag limits and hunting season for birds.
- Illegal hunting of sea turtles, crocodiles and manatees.
- Illegal extraction of mangrove lumber, sticks and charcoal.

➤ Pollution:

- Oil spills and other chemical accidents (rare).
- Dunder (the high nutrient by-product from the production of rum) and other sugar wastes.
- Limited central treatment of domestic sewage.

➤ Destruction of mangroves:

- Threatened expansion of solar salt works.
- Threatened expansion of heavy industry.
- Fish and shrimp farms.

➤ Invasive species:

- Green Mussel (*Perna viridis*) could spread into the area from Kingston Harbour.
- Shiny Cowbird (*Molothrus bonairensis*) could affect indigenous and endemic birds.
- Rats and cats, and human settlements on cays threaten turtles and seabirds.
- Pondweeds (*Hydrilla* and other species) block waterways.

➤ Climate change:

- Rising sea levels could affect some mangroves and cays.

➤ Deforestation of dry forests for illegal plantations.

➤ Lack of integrated planning.

(b) In the Surrounding Area:

- Poor agricultural practices, deforestation, soil erosion and use of agricultural chemicals contribute to sedimentation and pollution of surface and ground water.

- Pollution from major cities and towns, including nitrate-enriched groundwater resulting from poor sanitation; rubbish and polluted outflows from Kingston Harbour affect the coast for many miles to the west of Kingston.
- Excess pumping of aquifers for irrigation contributes to saline intrusion.

25. Conservation measures taken:

The Hellshire Hills Forest Reserve and Peake Bay Forest Reserve are both within the boundaries of the Ramsar site. However there has been little or no enforcement of their status. In 1999, the Government of Jamaica designated the Portland Bight Protected Area (PBPA) on the basis of a management plan prepared by the Caribbean Coastal Areas Management (C-CAM) Foundation. Proposals for protection of Portland Bight were first made in the 1950s. These have been synthesised and augmented by C-CAM in preparing its Management Plan. Other preparatory measures (all of which were focused on development of management recommendations and monitoring programmes) included:

- Inventory of wetland resources including juvenile fish populations.
- Coral reef inventory.
- Assessment of dry forests, including reptile and bird populations.
- Socio-economic assessment.
- Formation of a series of local user-groups including five fisheries organizations.
- Formation of a series of stakeholder councils, including the Portland Bight Fisheries Management Council (PBFMC) and the Portland Bight Citizens' Council (PBCC).
- Studies of marine turtles and crocodiles.
- Management planning for land birds in mangroves.

On July 18, 2003 the Jamaican government delegated responsibility to CCAM for the natural resources of the PBPA.

26. Conservation measures proposed but not yet implemented:

The Government of Jamaica is in the process of completing the regulations which will govern activities within the PBPA. Once promulgated these regulations will be implemented by the entities designated with management responsibilities with oversight from the National Environment and Planning Agency. The current management plan proposed by CCAM includes the creation of twenty-eight (28) special management zones [seven natural nature reserves (IUCN Category I, i.e. "strict protection"), seven species management areas (IUCN Cat. IV, i.e. "conservation through active management"), seven habitat management areas (IUCN Cat. IV), and five recreation areas] each of which would be governed by regulations controlling use. The plan also calls for a comprehensive programme of monitoring, law enforcement, community education and stakeholder involvement.

27. Current scientific research and facilities:

- Assessment and management of land birds in wetlands of Portland Bight, funded by National Fish and Wildlife Foundation (NFWF) and implemented by CCAM.
- Water Quality Monitoring, funded by the Inter-American Development Bank (IDB) and implemented by C-CAM.
- Fish stock assessment, funded by the Canadian International Development Agency (CIDA) through the CARICOM Fisheries Resource Assessment and Management Programme (CFRAMP) and conducted by the Fisheries Division assisted by C-CAM.

28. Current conservation education:

- CCAM's two field officers are currently involved in fisheries education.
- Occasional seminars for fishers' organizations.
- Annual Fisheries Symposium for fishers.
- Annual Game Warden Training course provided by CCAM.

29. Current recreation and tourism:

Tourism is very small in scale and not organised. The only visitor accommodation is provided in

the large towns outside the protected area. Five hunting clubs maintain hunting lodges. The major period of activity is the hunting season (September–October). Otherwise there is no particular seasonality.

- One party boat operates out of Salt River (no data available on number of trips or visitors).
- Birdwatchers visit regularly (about 50-100 p.a.).
- Public bathing beaches at Hellshire, Welcome, and Jackson's Bay used by about 20,000 local people annually.
- Hot springs at Salt River used by about 2,000 local people annually.
- Five gun clubs, of which three also have members involved in sport fishing. (No estimate of number of trips). Two clubs host an annual fishing tournament.
- Nearshore coral cays (especially Pigeon Island and Big Half Moon Cay) visited regularly for picnics in small numbers.

30. Jurisdiction:

- Territorial Jurisdiction over the parishes of Clarendon and St. Catherine is exercised by the relevant local government authorities, the St. Catherine Parish Council and the Clarendon Parish Council.
- Functional Jurisdiction for conservation is the responsibility of the Ministry of Land and Environment- Ministry of Agriculture, Ministry of Local Government and Urban Development Corporation (UDC)

31. Management Authority:

By statute, the

- Natural Resources Conservation Authority
Through its agents the Protected Areas Branch of the National Environment and Planning Agency, 10 Caledonia Avenue, Kingston 5
Contact person; Carla Gordon - Manager

By designation, the

- Caribbean Coastal Areas Management Foundation (C-CAM)
The actual day to day management of the area has been designated to CCAM by NEPA which retains only an oversight function. As such materials and queries related to this area should be routed through this entity.

32. Bibliographical references:

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