Information Sheet on Ramsar Wetlands (RIS) Port Launay Coastal Wetland – Seychelles.

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.

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Designation date
Site Reference Number

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2. Date this sheet was completed/updated:
November - 2004

3. Country:
The Republic of Seychelles.

4. Name of the Ramsar site:
Port Launay Coastal Wetlands.

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* _ -or- *no*
Yes.
b) Digital (electronic) format (optional): *yes* _ -or- *no*
Yes.

6. Geographical coordinates (latitude/longitude):

4° 39' 16" S, 55° 24' 21" E.

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

The Port Launay (Port Glaud) wetlands are on the western coast of the main island in the granitic Seychelles, Mahé. The site is within the Port Glaud administrative district. The nearest large town is Grand Anse, 4 km by road to the south. The capital, Victoria, is 18 km from the wetlands by road. The wetlands are almost contiguous with the Port Launay and Cap Ternay Marine National Parks (MPAs).

The adjacent Port Launay beachfront and the MPAs are major visitor attractions, and a five-star hotel is planned between the beach and the wetlands.

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

Minimum: sea level. Maximum: 25 m.

9. Area: (in m2)

Total designated area is 120.59ha

10. Overview:

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

Two fast-flowing mountain rivers, the Mare aux Cochons and Cascade, join to the northwest of the Ramsar site before entering and flowing through the Port Glaud mangroves. The Cascade River arises above, and flows through, the Mare aux Cochons marshes, the only upland marsh on Mahé and a future Ramsar site. Three rivers; Griffiths, L'Islette and an unnamed watercourse, feed the southern part of the Port Glaud coastal wetlands. Approximately half of the wetland is mangrove. Mangroves are an important component of the original vegetation cover in the Seychelles, and play a vital role in storm-damage limitation, water quality maintenance, coral reef and lagoon protection, and nutrient retention. They are also breeding grounds for several ecologically and commercial important animal species. No Seychelles mangroves are particularly extensive, owing to the limited area of flat coastal land and the small size of the islands' rivers, but the Port Launay block is among the largest. Seven mangrove tree species occur in the Seychelles *(Bruiguiera gymnorhiza, Ceriops tagal, Sonneratia alba, Lumnitzera racemosa, Avicennia marina* and *Xylocarpus granatum)*. All occur at this site. The Port Launay mangroves are considered to be among the most representative on Mahé Island and strict protection has been proposed (Government of Seychelles, 1996). Following the recommendations of the Government of Seychelles (1996), the site includes the small island of l'Islette and the adjacent shallow marine lagoon out to the reef. The site also includes a small area of modified beachhead and coastal plateau (local name for coastal plain) habitats. Typical Seychelles beachhead and coastal plateau plants include *Scaeveola cerecea, Ipomea convolvulus, Hibiscus tiliaceous, Heritiera littoralis, Guettarda speciosa, Barringtonia asiatica, Hernandia nympaeifolia, Calophyllum inophyllum* and *Terminalia catapa*. This habitat is believed to be important for the little-known Seychelles sheath-tailed bat, *Coleura seychellensis* (CR), known from only four active cave-roosts, one of which occurs in the local area. This bat is little-known but appears to have a preference for coastal areas (Rocamora & Joubert, 2004). The eastern edge of the wetlands is marked by a transition to freshwater and hillside communities, and the brackish water fern, *Acrostichium aureum*. The feeder rivers have at least one endemic freshwater fish species, plus several endemic crayfish. The endemic fish, *Pachypanchax playfairii*, has been confirmed, and it is possible that a second, *Ophiocara porocephala*, together with an as-yet undescribed third endemic species may occur at the site. The hillsides are covered in forest comprising exotic and endemic species, with the latter including the palms, *Verschafeltia splendida* and *Phoenicophorium borsigianum* and the screw-pine, *Pandanus hornei*. Invertebrates. Spiders (*Argipide sp*), Palm spider (*Nephilia sp*), Dragon fly (*Ischnura sp*., *Cerargrion sp*) and Lizards.

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).

Criterion 1 – The mangroves and adjacent coastal plateau vegetation are representative of small oceanic islands within the Western Indian Ocean sub-ecoregion. Mangrove composition differs through the sub-ecoregion, and the Seychelles characteristically has fewer species and smaller trees. The mangroves at this site are among the most intact and representative in the granitic Seychelles.

Criterion 2 – The Seychelles sheath-tailed bat, *Coleura seychellensis* (CR), is known from the immediate area and likely forages over the site. It is one of very few localities where the species is known to occur, and the only locality so far detected on Mahé Island. A small number of Millionaire's salad palm, *Deckenia nobilis* (EN), occur on the site, but it is unclear if these are planted. One also notes the presence of numerous mature *Pandanus hornei* (VU) on the coastal plateau The Seychelles swiftlet, *Collocalia elaphra* (VU), is encountered over the site. One also finds the endemic Seychelles flying fox (*Pteropus seychellensis*) (CR).

Criterion 3 – The mangroves noted for Criterion 1 support a wide range of invertebrates (listed in Section 20) which require mangroves for different stages of their lifecycles. As one of the best representative mangrove blocks in the Seychelles, the site is an important reservoir for restocking other areas. The hillsides are covered in forest comprising three endemic species: the palms *Verschafeltia splendida* and *Phoenicophorium borsigianum* and the screw-pine, *Pandanus hornei*. Two endemic snakes occur within the Ramsar site and immediately adjacent catchment and coastal plateau areas. These are *Boaedon geometricus* and *Lycognathus seychellensis* (based on Nussbaum, 1984b). Three endemic skinks, *Mabuya seychellensis*, *Janataescincus broueri* and *Pamelaescincus gardineri*, occur in habitats found at the site (Cheke, 1984). The endemic chameleon, *Chamaeleo tigris*, is likely to be present, as well as two species of endemic green geckos, *Phelsuma* spp. The sandy soils of the woodlands are home to several endemic amphibian caecilians. The adjacent coastal plateau woodlands are degraded but some of the native tree species (particularly *Calophyllum inophyllum* and *Terminalia catapa*) are important food sources for the endemic Seychelles flying fox (*Pteropus seychellensis)*, the Seychelles blue pigeon (*Alectroenas pulcherrima*) and the Seychelles bulbul (*Hypsipetes crassirostris*).

Criterion 4 – The wetlands site is a breeding site for the Green-backed heron, *Butorides virescens*. Based on other studies of mangroves in the Seychelles and elsewhere, several marine Crustacea and fish are believed to spawn and/or pass juveniles stages of their life cycles in the mangroves, including the Emperor red snapper, *Lutjanus sebae*. The semi-terrestrial crab, *Cardisoma carnifex*, descends to the site to breed. Crabs in the genera *Scylla*, *Metapograpsus*, *Sesarma*, *Macrophthalmus* and *Uca* breed in these mangroves or pass part of their lifecycles there.

Criterion 7 – The mangroves are the interface between a coral reef-fringed shallow coastal lagoon and a typical granitic Seychelles river system. The indigenous lagoon fish commonly enter the mangrove system, and do some coral reef species. The endemic freshwater fish, *Pachypanchax playfairii*, lives its entire lifecycle in the two rivers feeding the mangroves. It is possible that a second, *Ophiocara porocephala*, together with an as-yet undescribed third endemic species may occur at the site. Other aquatic fauna that is important or endemic includes members of ***Crustacea*** (*Scylla serrata, Uca annulipes, Sesarma impressa,* and *Cardisoma carnifex*) and the bivalves – *Quidnipagus palatam, Gafrarium tumidum, Gafrarium pectinatum, Anadara antiqyata* and *Ctena divergens*

Criterion 8 – Based on studies of similar mangroves, it is likely that several pelagic (e.g. *Sardinella* spp and *Atherinidae* spp) and demersal and semi-demersal fish species (***Carangidae*** - *Caranx* spp; ***Mullidae*** – *Pseudupeneus* spp.; ***Lutianidae*** – *Lutianus kasimira*, *Lutianus fulviflamma*; *Lutianus argentima-culatus*; ***Lethrinidae*** – *Lethrinus nebulosus, Lethrinus lentjan, Lethrinus caeruleus*; ***Serranidae*** – *Epinephelus summana*; ***Gerridae*** – *Gerres oyena*; ***Plectorhyncidae*** – *Diagramma pictus, Gaterin sordid*; ***Sphyraenidae*** – *Sphyraena barracuda*) use this site as spawning nursery and feeding ground, including the Emperor red snapper *Lutjanus sebae.* At low tide, *Periophthalmus sobrinus* and *P. keolrenteri* can be observed.

The mangrove is a sediment and nutrient trap, fed by the two fast flowing feeder rivers. The semi-terrestrial crab, *Cardisoma carnifex*, breeds in the mangroves. Shrimps from the genera *Palaemon* and *Palaemonella* have also been recorded, as well as *Peneus japonicus, Peneus semisulcatus, Peneopsis rectatus,* and *Peneopsis japonicus.*

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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:

Marine: Western Indo-Pacific Realm, West Madagascar Marine Ecoregion.
Terrestrial: Afrotropical Realm, Seychelles and Mascarenes Moist Forests Ecoregion.
It should be noted that the terrestrial Seychelles has a clear sub-ecoregional distinction from other islands and African coastline areas in the larger Afrotropical and Western Indian Ocean categories. For this reason, WWF produced a tentative classification termed "Granitic Seychelles forests." This designation is listed for peer review on the WWF internet site. Floristic endemism is high, with more than 250 unique species recorded. Endemic plant affinities are with Asia, Madagascar and Africa. The proportion of the fauna that is endemic is also elevated. Although very small, the Seychelles boast two endemic families, the Sooglossidae (frogs) and the Medusagynaceae (Jellyfish tree), indicating a long period of separation and divergence from other landmasses. There are also nine endemic plant genera in the Seychelles, and three of them occur at the site.

b) biogeographic regionalisation scheme (include reference citation):

WWF Global 200 Ecoregions (Olson & Dinerstein, 2002).

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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 mangroves of Port-Glaud – Port Launay are at sea level and are entirely natural. Areas closest to the coast that are exposed at low tide have a surface covering of white coral sand mixed with mollusc shell fragments, but sub-surface layers are darker in colour. The sands are constantly cycled by burrowing molluscs and crustaceans, as well as water flow from the rivers and tidal movements. The more inland mangroves have swampy haline mud or mud/sand substrates that are formed from red laterites and brown kaolin clays carried in the rivers. Upon arrival at the coastal plain, the five rivers providing input to the mangroves split into several strongly meandering channels through the mangroves. These vary in width from 1 – 6 m and are less than 1 m deep at low tide. The river mouth is shallow and no less than 10 m wide. The water is clear, except when sediment is flushed at the onset of heavy rains.
On arrival at the coastal plateau, the three fast-flowing feeder rivers(River Mare Aux Cochons, River l'Islette, and River Griffiths) are usually clear and for the greater part of the year, sediment-free. During flood periods, the sediment load may be temporarily increased, but it is clear from deposit patterns that most or all sediment is dropped as it arrives on the plateau. Reddish laterite and kaolinitic sands fan out at the foot of the hills and are trapped by dense stands of the aquatic fern, *Acrostichium aureum*, or by the mangroves.
The coastal plateau adjacent to the mangroves is an embayment head that has probably formed within the previous 6,000 years, before the development of today's protective coral reef barrier. The soils are calcareous and well-drained, and are believed to have originated from bioclastic carbonates from the shallow intertidal area, possibly at a time of lower sea-level in the past. The soils are alkaline and have a thin humus layer. They are relatively fertile compared to the laterite hills slopes, and are commonly cultivated.

The mangrove opens directly into a shallow lagoon that is approximately 1 – 2 m deep at low tide. The lagoon has an alternating rocky and sandy floor, and extends to an algal encrusted rocky platform that forms the reef edge. There is no evidence of significant or persistent siltation arising from storm flooding. Tidal range is usually 1.2 m.
The Ramsar site includes the lower slopes of the surrounding hills where the rivers enter the plateau. The rivers are relatively large for the granitic Seychelles, with a width of up to 5 m and a depth of 1-5 m. As is typical of rivers on the islands, their respective courses are characterized by large (up to 3 m across) jumbled granite boulders intermittent with sandy, gravel or kaolinitic beds. The river banks are steep and made up of red laterite soils and embedded boulders. The rivers are permanent.
The site has a moist tropical oceanic climate. The granitic Seychelles are north of the cyclone belt and rarely exposed to severe storms. There are two main seasons: the drier southeast monsoon or tradewinds monsoon occurs from April – October, while the wetter and warmer northwest monsoon prevails for the rest of the year. There a usually a calm transition between the two seasons, especially between the southeast and northwest monsoons. Annual rainfall is 2,408 mm, with highest rainfall occurring in December. Temperatures taken at Victoria on the eastern side of the island have an average minimum of 24.8°C and an average maximum of 28.4°C, with the respective extremes records being 19.9°C and 32.8°C. Relative humidity varies from a low of 74% in April to a high of 80% in January. Rain-free periods seldom exceed a few weeks in length.

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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).

At least three of the incoming rivers arise from on the steep western slopes of Mahé within the Morne Seychellois National Park. The Mare aux Cochons/Cascade River system arises at more than 500 m altitude and flows through the Mare aux Cochons upland marshes, one of only three habitats of this type in the entire granitic Seychelles. Flow rates.

	Mare -Cochons	L' Islette	Griffiths	Total
Catchment area km2	5.416	2.450	1.000	8.866
Mean Annual runoff-mm3	9.011	4.076	1.664	14.751
Daily flow (l/s) equalled or exceeded of 50%of time.	100	45	18	163
Dry Season flow (l/s)	11.9	8.8	4	24.7
Peak flows (l/s)	27325	12360	5045	44730

Average abstraction from river 675 kilolitres/day, river mare aux Cochons is2500 kilolitres/day when operational. Islette river catchment area is 2.71 km2 and the mare aux Cochons is 5.416 km2, there are 383 consumers in this area and approximate revenue generated is SR-53 000 = 10,000 USD/year.

Most of Mahé is composed of grey alkali granites with microperthite, oligoclase and quartz (Braithwaite, 1984). The Port Glaud area differs slightly in having porphyritic ganodiorite granites with local concentrations of aplites and quartz veins. This formation blends in with the normal granite elsewhere on the island. The age of the granites is estimated at 650 million years, placing them in the Precambrian. Exposed rounded granite inselberg-like outcrops are a common and characteristic feature of the Seychelles. They are deeply weathered and typically have vertical flute-like gullies. The dominant soil is a deep red laterite that is vulnerable to erosion when exposed. Small depressions in the slopes differ in accumulating kaolinitic clay. The hill slopes and river valleys have numerous large boulders. These may accumulate into piles within which shallow caves are formed within the spaces.

Forest types on the slopes are classified as coastal and lowland, riverine, intermediate forests (Procter, 1984; Robertson, 1989; Carlström, 1996). All are well-represented in the catchment area, although coastal and lowland, together with riverine areas are generally highly modified by historical over-exploitation and

the presence of invasive plants. Mist forests are a distinct formation on the highest elevations and some of the best preserved areas extending from Morne Seychellois to Congo Rouge enter the catchment area. (Carlström, 1996). Le Niol River flows through an altitudinal wetland. This type of habitat is rare in the Seychelles and will soon be nominated as a Ramsar site.

No habitation exists on most of the catchment area as it is within Morne Seychellois National Park, or is inaccessible. Only the lowest slopes are taken up with residential homes.

A youth camp existed on the coastal plateau adjacent to the mangroves. It was closed eight years ago and native coastal species are slowly regenerating along its fringes. The old camp is slated for the development of a five-star hotel. A road runs through the mangroves but has ample culverts to allow river run-off and tidal movements. The mangroves are otherwise essentially intact.
Climate is similar to that described for the site, but rainfall increases with altitude and temperatures decrease slightly.

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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.

The mangroves are a sediment trap that protects the shallow marine lagoon and adjacent barrier reef. The mangroves prevent serious erosion of the coastal plateau where residential areas already exist and a new hotel is to be sited. Coconuts are also grown as a commercial crop on the plateau.

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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*.

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

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

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

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

Coastal beach front of the site mostly of the wetland type A, which follows the predominant mangrove swamps of Intertidal nature vegetation (wetland type I) . Further away from the beach front, inland; it is mostly Intertidal brackish freshwater marshes (type H). Permanent rivers with small water falls (M) and freshwater tree dominated wetaland (Xf) occupy the rear side of the site. Types E, F and Tp are intermittent within the system. In general, most of the wetland area is Type A, with Type I vegetation and type Xf vegetation in general. ZK(c) is mostly to the periphery of the wetlands where there are residential houses and is very limited.

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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 site's barrier reef and coastal lagoon are typical examples for this part of Mahé. However, it is unusual among Mahé reefs insofar as its abundance of encrusting algae mixed with corals.
Mangroves are among the most resistant habitats to invasive species, a factor that has modified the majority of ecological communities in the Seychelles (Carlström, 1996). Few alien species are able to colonize under the specialized conditions of mangroves, and exotics have never posed a threat. Mangroves were once common along the shores of many of the granitic islands, especially Mahé, but most have been cleared for housing development, reclamation and agriculture. The Port Glaud – Port Launay site is probably relatively pristine. It may act as a reservoir for other recolonizing mangrove areas on the island.

Coastal plateaux have been markedly modified throughout the granitic islands and many native species have become rare. They were among the first forests to be exploited for timber and are the most developed in terms of housing development, agriculture and other human activities. If left undisturbed, native plants may re-establish. The fringing beachhead vegetation is also highly modified but is usually dense and is important for preventing erosion arising from storms or development.

Forest types on the slopes of the catchment area are classified as coastal and lowland, riverine, intermediate and mist forests by Carlström (1996). An alternative classification would be low altitudinal and high altitudinal forests, restricted largely or entirely to the islands of Silhouette and Mahé, including close neighbours of the latter. All are well-represented in the catchment area, although coastal and lowland, together with riverine areas are generally highly modified by historical over-exploitation and the presence of invasive plants. The most common invasives are cinnamon (*Cinnamomum verum*), guava (*Psidium cattleianum*) and 'Albizia' (*Paraserianthes falcataria*). Mist forests occur at the highest elevations and some of the best preserved areas extending from Morne Seychellois to Congo Rouge enter the catchment area. (Carlström, 1996). Le Niol River flows through an altitudinal wetland. This type of habitat is rare in the Seychelles and will soon be nominated as a Ramsar site.

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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*.

Marine

Sea grasses:

The site has three species of sea grasses; they are encountered in co existence on the seabed. *Halophila ovalis*, H*alophila stipulacea* and *Holodule uninervis* are the three species. These three phanerograms form a composite grass bed. *Halophila ovalis* forms a belt of about 50m wide facing the beach to disappear as depth increases, whereas the two other species are present up and over 600 m seawards at depths ranging from –7 to –10m. These sea grasses are locally "blanketed" by a film of brown cyanobacteria. These cyanobacteria developments appear "cyclically" on the grass beds, even on well preserved natural sectors.

Mangroves

The site has all seven-mangrove tree species known from the Seychelles, plus two or three other species typically associated with mangroves on these islands. Distribution patterns are typical at the site with respect to degrees of tidal inundation, although the relative abundance of different species is as yet to be determined. The mangrove may provide seed and plantlet stocks for recolonizing areas elsewhere.

Coastal plateau and beachhead

The two communities are juxtaposed and both are highly modified. Of note is the presence of numerous mature *Pandanus hornei* (VU) on the coastal plateau. The usually dominant Takamaka (*Calophyllum*

inophyllum) is regenerating well in certain areas. This valued timber species has suffered from a recent outbreak of accidentally introduced fungus infections, killing large numbers of individuals on the islands. Recovery is slow.

Riverine and low altitude forest
Both of these forests are modified by introduces species but mature *P. hornei* (VU) and *Deckenia nobilis* (EN and an endemic genus) are noteworthy. The two endemic palms, *Verschafeltia splendida* and *Phoenicophorium borsigianum* (both Lower Risk – Near Threatened and endemic genera) also merit mention. As in most forests of this kind in the Seychelles, Cinnamon is a pervasive invasive species.

Overall
The site is one of the best examples of the beachhead, coastal plateau, mangrove and lowland forest continuous ecosystems on Mahé, even if several of the habitats have been degraded.

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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.*

Based on fishers' reports, the marine lagoon and reef barrier appear to have typical fish and invertebrate communities although we are unable to find detailed surveys specific to the site. One species of sea cucumber is common in the shallow lagoon, but this is a taxon that is not taken by commercial harvesters. Six crab species have been recorded in the lagoon, the intertidal and the beaches. Hawksbill and Green turtles (*Eretmochelys imbricata* and *Chelonia mydas*) regularly visit the barrier and perhaps the lagoon

The Seychelles mangroves have ten crab species in the genera *Scylla*, *Metapograpsus*, *Sesarma*, *Macrophthalmus* and *Uca* (Haig, 1984). The semi-terrestrial crab, *Cardisoma carnifex*, breeds in the mangroves. Shrimps from the genera *Palaemon* and *Palaemonella* have also been recorded. None of these crustaceans are harvested for food in the Seychelles but they play an important role in recycling organic materials. Populations at this site may also act as a reservoir for restocking more degraded or recolonizing mangroves. There are two freshwater crab species in the granitic Seychelles. The commoner *Sesarma* sp. occurs in the two rivers, but the rarer endemic *Deckenia alluaudi* is likely to be restricted to higher altitudes if it occurs in the catchment area.

The main invasive species in the mangroves is the fish *Tilapia (Oreochromis sp)*. This species is now common in all mangrove and estuarine areas in the granitic Seychelles. Its initial impacts on native fauna are unknown, but it appears that there are currently no apparent negative impacts. The two freshwater fish species are outside of the preferred Tilapia habitat. The most common endemic freshwater fish species, *Pachypanchax playfairii*, is abundant in the feeder rivers. The presence of *Ophiocara porocephala*, together with an as-yet undescribed third endemic species, has yet to be confirmed.

There are 32 land and freshwater crabs in the granitic Seychelles, but the number occurring in the feeder rivers is as yet unknown. Amphibians of interest within the Ramsar site include several caecilians but there have been no surveys to date. Likely species include *Hypogeophis rostratus* and several members of the genus *Grandisonia* (based on Nussbaum, 1984a). All caecilians are endemic and are believed to be a vestige of the Gondwanaland break-up. Three or four species (the taxonomy is disputed for one species) of the endemic frog family, the Sooglossidae, occur in the catchment areas at higher altitudes within Morne Seychellois National Park. None descend to the lower altitudes of the Ramsar site.

An Asian exotic parthanogetic burrowing snake, *Ramphotyphlops brahminus*, is also present (Nussbaum, 1984b). This apparently accidental introduction is widespread on the islands. It is somewhat ecologically similar to the endemic caecilians but no negative impacts have been reported.

Noteworthy birds occurring in the Ramsar site and immediately adjacent areas include species like *Ardea cinerea, (*Grey Heron) *Butorides virescens* (Green Back Heron) and *Bulbus ibis* (Cattle egret). Sand plowers are some of the common birds present The number of seabirds present at any given time is small.

Two native mammal species are found in the Seychelles, the flying fox, *Pteropus seychellensis seychellensis*, and the emballonurid insectivorous Seychelles sheath-tailed bat, *Coleura seychellensis* (CR). The flying fox is a regular visitor, and the sheath-tailed bat is known from this area. The coastal plateau and surrounding hill/boulder habitats appear to be preferred by this rare bat (Rocamora & Joubert, 2004)

Rats (*Rattus rattus*), mice (*Mus musculus*) and the Malagasy tenrec (*Tenrec ecaudatus*) are common introduced and invasive species at the site. All of these may predate caecilians and other small vertebrates, but no continuing significant negative pressures have been noted (Racey and Nicoll, 1984). The introduced species include Indian mynah (*Acridotheres tristis*), Indian barred ground dove (*Geopelia striata*) and the Madagascar fody (*Foudia madagascariensis*) are common. Introduced Barn owls (*Tyto alba*) are also present. The African snail *Achatina* sp. is widespread and common.

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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.

Local fishers use these areas, probably mostly for collection of octopus for consumption.
Port Launay is a marine national park and its water quality and reef habitats benefit from the sediment-trapping services provided by the mangroves. The bay is also one of the most attractive areas on Mahé and, with the development of the proposed hotel, will continue to offer clean beaches and clear seas for visitors. The mangroves are also inherently attractive and will be made partially accessible to visitors and educational groups. Tourism in the Seychelles is aimed at the upper bracket of the market and is the country's largest source of foreign currency. The tourism industry is one of the largest employment sectors.
The Seychellois people and their government are justifiably proud of their environment, both from an overall esthetic standpoint and in terms of the richness in endemic and biologically interesting flora and fauna. The site will therefore be viewed positively as it helps to preserve a rather pristine mangrove habitat that is typical for the islands. Coconuts are also grown as a commercial crop on the plateau.

The Public Utilities Corporation (PUC) pumps clean freshwater from the lower reaches of the Mare aux Cochons River. This facility currently pumps 2,500 kl/day to 383 domestic and commercial consumers.

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22. Land tenure/ownership:

(a) Within the Ramsar site:
State land.

(b) In the surrounding area:
State land for beaches, lagoons, reef barriers some native forest areas immediately adjacent to the site, and Morne Seychellois National Park in the upper catchment area.
A government-owned bus depot exists near the Ramsar site, and the lower slopes of the hills have been developed in part as privately-owned residential areas.

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23. Current land (including water) use:

(a) Within the Ramsar site:
As a wetlands area, the Ramsar site cannot be developed without permission of the government. The only authorized developments to date are the construction of a road traversing the mangrove and a water adduction plant on the Polonais River. The road has regular culverts to allow free water flow and the

adduction plant has no apparent negative impacts on the river's ecology. Local fishers use these areas, probably mostly for collection of octopus for consumption.

(b) In the surroundings/catchment:
Apart from residential plots, most of the catchment area is maintained under forest either for biodiversity conservation (Morne Seychellois National Park) or for watershed protection.
Residential areas have gardens and some areas are used for vegetable gardening.
Single- and dual-track all season roads provide access to residential areas.
The beaches are freely accessible to tourists and residents. Baie Launay is a no-fishing area but access for tourism purposes in permitted. Other marine areas are freely accessible, but spear guns are not permitted anywhere in the Seychelles.
The planned five-star hotel will be designed to minimize risks to the Ramsar site and its owners will be encouraged to financially support its management.

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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:
The continued presence of exotic species outside of mangrove areas presents an obstacle to assisted restoration.
Encroachment by residential areas is a risk, as is the possibility of undesirable effects of tourism development. However, no tourism facilities can be built within 25 m of the high water mark.

(b) In the surrounding area:
The same factors pertinent for the Ramsar site apply to surrounding areas. There is also a continuous risk of soil erosion during heavy storms.
As far as the planned five-star hotel goes, the project is at the planning stage, EIAs haven been carried out, and efforts are being made for the hotel management to adopt the site, as they would be the main benefactors from the site. Proposals will be made to the proponents, to construct board walks through the mangroves in a circular way to enjoy the beauty of the mangroves, tide fluctuations, different birds visiting the site, different varieties of fish, crabs, other molluscs using the habitat for their life support and protection etc. When completed, this site could even help to study the mangrove vegetation; ecology and other characteristics for research both locally and internationally.

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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.

Development or transformation of all Seychelles wetlands is strictly regulated, and many areas are set-aside for protection. The government has initiated management planning for the Ramsar site, including the development of educational and tourism facilities within the mangroves.
Currently, there is no specific legislation for wetland protection, however the existing Environment Protection Act covers all the areas. The proposed Seychelles National Wetland Policy classifies all the wetlands under three major categories. Like Class –A, B, C. Port Glaud Comes under class A ie top priority for protection and conservation. However, the river catchment areas fall under National Parks which is protected under National Parks and Nature Conservancy Act. Any development in this site is subjected to Class –I type of environmental impact assessment.
Communities are involved through their District Administration office; as the designated area is mostly coastal , the impact on the residents are minimal, however once the site is well established the Port Glaud district community will greatly benefit from the eco tourism, souvenirs, guest houses etc.

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26. Conservation measures proposed but not yet implemented:
e.g. management plan in preparation; official proposal as a legally protected area, etc.

Biological surveys and the development of a boardwalk through the site are currently being planned.

27. Current scientific research and facilities:
e.g., details of current research projects, including biodiversity monitoring; existence of a field research station, etc.

Researchers are encouraged to work in the site and the catchment area. Monthly monitoring of the site is ongoing. More activities, like educational, research are being planned for this site especially on the terrapins.

28. Current conservation education:
e.g. visitors' centre, observation hides and nature trails, information booklets, facilities for school visits, etc.

The Ministry of Environment and Natural Resources (MENR) invited representatives from commerce, local communities, other government ministries and NGOs to a Ramsar pre-acquisition workshop in February 2004. The workshop provided information on the Ramsar Convention and its potential ramifications for the Seychelles. The Port Glaud site was proposed at this time and district representatives met with local residents to share the information. Subsequently, MENR personnel met informally with residents to exchange ideas.
The MENR Wetlands Unit works with the Education and Information Section within the same ministry, the Ministry of Education and Youth, the Ministry of Employment and Social Affaires, and the District Administration to educate communities and schools regarding wetlands. MENR also promotes wetlands conservation through the national media.
MENR works closely with the Ministry of Transport and Tourism to ensure that the proposed hotel facility will not cause negative impacts to the site.

In addition, this is one of the top sites for education and sensitisation of the public as well as school children on the World Wetlands Day. This site has all the seven species of available mangrove species at one place. Can be viewed easily and gives very close encounter with all the species, mangrove characteristics, different fish, birds, and other species of the habitat. Their characteristic features like Vivipary, Pnematophores, and Salt glands thick barks can be seen easily. All these create awareness and interest among the public and school children on the wetlands and their role played and importance of protecting them.

29. Current recreation and tourism:
State if the wetland is used for recreation/tourism; indicate type(s) and their frequency/intensity.
Baie Launay attracts relatively modest numbers of beachgoers and picnickers at present, but the number will increase once the proposed hotel facility is created. Small numbers of visitors are attracted to the mangroves.
There is a nature trail from the site to the Mare aux Cochons higher altitude wetlands on Le Niol River, within the Morne Seychellois National Park. A small waterfall on privately owned land lower down the river is open to visitors.

30. Jurisdiction:
Include territorial, e.g. state/region, and functional/sectoral, e.g. Dept of Agriculture/Dept. of Environment, etc.
All state lands are under the jurisdiction of the Ministry of Land Use and Development but, as a Ramsar site, MENR will have jurisdiction.

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.

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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.

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