

Information Sheet on Ramsar Wetlands (RIS) – 2009-2014 version

Available for download from http://www.ramsar.org/doc/ris/key_ris_e.doc and
http://www.ramsar.org/pdf/ris/key_ris_e.pdf

Categories approved by Recommendation 4.7 (1990), as amended by Resolution VIII.13 of the 8th Conference of the Contracting Parties (2002) and Resolutions IX.1 Annex B, IX.6, IX.21 and IX. 22 of the 9th Conference of the Contracting Parties (2005).

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 17, 4th edition).
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

FOR OFFICE USE ONLY.

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Designation date

Site Reference Number

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

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2. Date this sheet was completed/updated:

27 October 2014

3. Country:

Republic of South Africa

4. Name of the Ramsar site:

Bot - Kleinmond Estuarine System

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

This RIS is for (tick one box only):

- a) Designation of a new Ramsar site** ; or
b) Updated information on an existing Ramsar site →

This RIS is the first phase (Phase 1) of a process which is to be updated with extended boundaries at a later stage (Phase 2) which will include the remainder of this wetland known as the Bot-Kleinmond Estuarine System (BKES).

6. For RIS updates only, changes to the site since its designation or earlier update:

Not Applicable

7. Map of site:

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

a) A map of the site, with clearly delineated boundaries, is included as:

- i) **a hard copy** (required for inclusion of site in the Ramsar List): ;
- ii) **an electronic format** (e.g. a JPEG or ArcView image) ;
- iii) **a GIS file providing geo-referenced site boundary vectors and attribute tables** →.

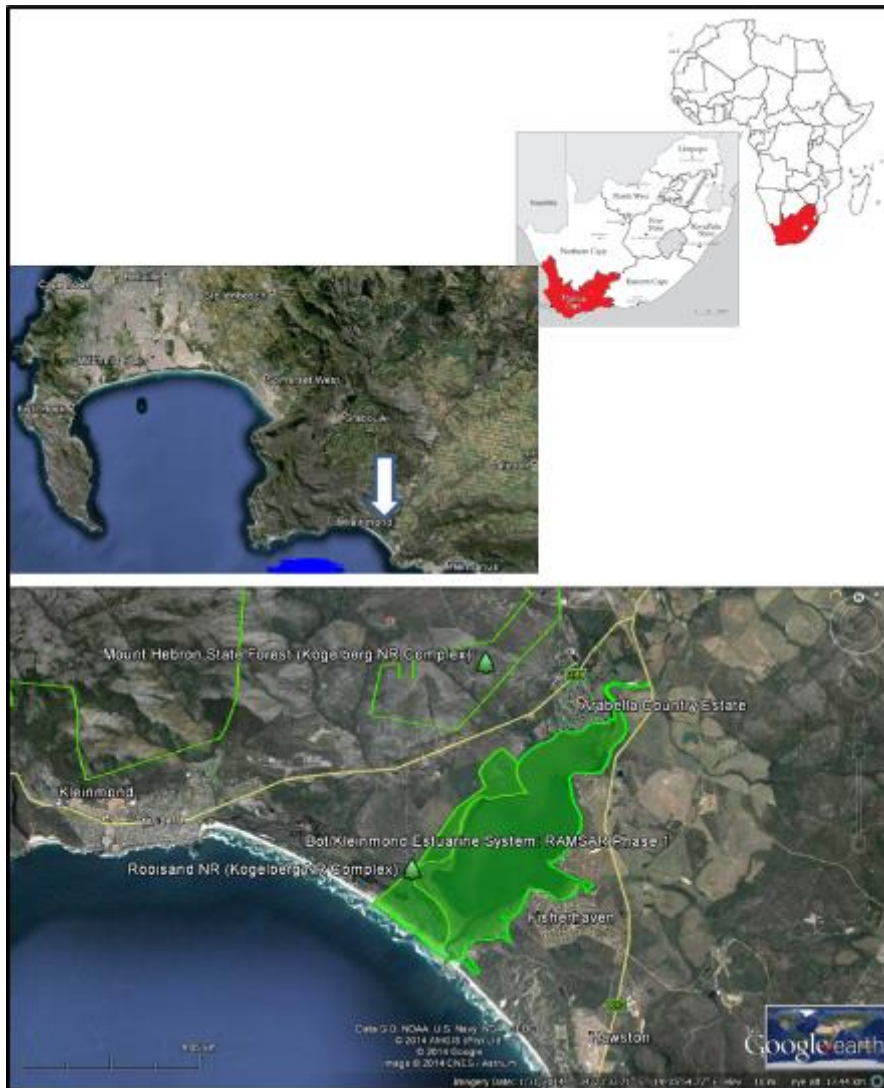


Figure 1: Bot-Kleinmond Estuarine System Ramsar Site: Phase 1

b) Describe briefly the type of boundary delineation applied:

Starting on the coast in the south west corner, the western boundary follows the property boundary of the Rooisand Nature Reserve in a clockwise direction until it intersects with the shoreline of the estuary. Then continuing in a north easterly direction along the shoreline until the main R43 bridge. Then following the southern boundary of the bridge until it intersects with the north eastern boundary of the estuary shoreline. Then following the estuary shoreline in a south westerly direction along its eastern boundary until it intersects with the coast. The southern (seaward) boundary incorporates the surf zone in the marine environment.

8. Geographical coordinates (latitude/longitude, in degrees and minutes):

Approximate Centre: 34°20'20.87"S 19° 6'26.19"E

The site lies between co-ordinates: 34°21'25.54"S 19° 4'46.60"E (SW corner) and
34°18'45.46"S 19° 8'52.77"E (NE corner)

9. General location:

The wetland lies approximately 80 km south east of Cape Town and approximately 110 km by road,

between the towns of Kleinmond and Hermanus in the Overstrand Municipal Area (Overberg District) on the south coast of the Western Cape Province in the Republic of South Africa. According to Census 2001 the population of the surrounding towns of Kleinmond, Fisherhaven and Hawston totalled approximately 16 300.

10. Elevation: (in metres: average and/or maximum & minimum)

Between approximately 4 meters below mean sea level (MSL) and 2 meters above MSL at its margins. The entire proposed site lies below 20 meters above MSL (Taljaard et al. 1999)

11. Area: (in hectares)

Approximately 1349.78 ha comprising of a terrestrial component, Rooisand Nature Reserve and an Estuarine component, Bot Estuary Water Body.

12. General overview of the site:

The Bot - Kleinmond Estuarine System is recognized as one of the ten most significant wetlands for waterbirds in South Africa's winter-rainfall region, encompassing the south-western parts of the country (Harebottle 2012). The estuary is also important as a nursery area for fish, with 41 species from 24 families having been recorded, of which 19 (46 %) species are dependent on estuaries to complete their lifecycle (CSIR 2011). It was ranked in the Top 10 most important estuaries in South Africa due to its size, habitat importance, zonal type rarity and biodiversity (Turpie & Clark 2007), and has been allocated an overall national Estuarine Importance Score of 94 out of 100 (CSIR 2011).

The estuary is used for both subsistence and recreational fishing, as well as yachting, boating, swimming and birding, and is a tourism destination catering for South African and international visitors.

13. Ramsar Criteria:

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9



14. Justification for the application of each Criterion listed in 13 above:

Criterion 1: The Bot-Kleinmond Estuarine System represents three wetland types according to the Ramsar classification. Primarily it can be considered Estuarine Waters (F), with the Bot section being marine-dominated when the mouth is open. However, since the mouth is predominantly closed, the Bot section more typically has the characteristics of a brackish Lagoon (J). The system has a double mouth, and the smaller Kleinmond section tends to be freshwater-dominated (K) when the mouth is closed.

According to the global classification system for estuaries and coasts proposed by Whitfield & Elliott (2011), the system is an estuarine lake, of which there are only 8 in South Africa.

Spalding et al. (2007) developed a global biogeographic system to classify the coastal and shelf regions of the world's oceans. The Bot-Kleinmond Estuarine System falls within the Realm: Temperate Southern Africa, the Province: Agulhas and the Ecoregion: Agulhas Bank, where there are no other estuarine systems with the same configuration.

Biogeographic systems identified for South Africa's coastline recognise three biogeographic regions,

but the boundaries vary for different fauna (e.g. rocky shore biota versus intertidal fish). For estuaries the boundary between the cool temperate and warm temperate zone has been identified as Cape Point on the basis of hydrological parameters and marine biota (Day, 1981, Potter et al. 1990) and Cape Agulhas on the basis of estuarine fish communities (Harrison 2002). The Bot-Kleinmond Estuarine System lies approximately mid-way between Cape Point and Cape Agulhas, placing it in a transition zone between the cool temperate and warm temperate biogeographic zones.

The Bot-Kleinmond Estuarine System is one of two estuarine lakes in this transition zone, the other being the neighbouring Klein River Estuary, which has different characteristics. The Bot-Kleinmond Estuarine System can therefore be considered a unique example of a wetland type in the region.

The system is among the 10 largest estuaries in the country in terms of water area. It plays a major role in the ecological functioning of the coastal system by providing a large body of water for birds during the dry summer months, and by serving as a nursery area for marine fish species. It is hydrologically important as it promotes seasonal water retention in the adjacent Lamloch Swamps, which provide habitat for critically endangered and endangered species of amphibians. In addition, the system's configuration helps prevent flooding, since the adjoining Kleinmond section acts as an overflow when water levels in the Bot section reach 1.7 m above mean sea level. Together with a 25% reduction in mean annual runoff, this means that the Bot estuary rarely opens naturally, and the system sometimes requires artificial breaching to maintain estuarine functioning.

Criterion 2: Of the 86 bird species recorded from the Bot-Kleinmond Estuarine System (CSIR 2011), 3 are globally threatened, most notably the Bank Cormorant, which is Endangered (A2ace+3ce+4ace ver 3.1). In addition, 13 species are nationally threatened, three of which are considered Vulnerable (Bank Cormorant, African Marsh Harrier and Blue Crane), and nine as Near-Threatened (Great White Pelican, Cape Cormorant, Crowned Cormorant, Greater Flamingo, Black Harrier, African Black Oystercatcher, Chestnut-banded Plover, Caspian Tern and Half-collared Kingfisher). Great White Pelican, Greater Flamingo, African Black Oystercatcher and Caspian Tern are identified as estuary-dependent species in the National Biodiversity Assessment 2011 (Van Niekerk & Turpie 2012).

Table 1: Threatened bird species in the Bot-Kleinmond Estuarine System

Common name	Scientific Name	Globally Threatened	Nationally Threatened
Bank Cormorant	<i>Phalacrocorax neglectus</i>	Endangered	Vulnerable
African Marsh Harrier	<i>Circus ranivorus</i>	Least concern	Vulnerable
Blue Crane	<i>Anthropoides paradiseus</i>	Vulnerable	Vulnerable
Great White Pelican	<i>Pelecanus onocrotalus</i>	Least concern	Near Threatened
Cape Cormorant	<i>Phalacrocorax capensis</i>	Near Threatened	Near Threatened
Crown Cormorant	<i>Phalacrocorax coronatus</i>	Near Threatened	Near Threatened
Greater Flamingo	<i>Phoenicopterus ruber</i>	Least concern	Near Threatened
Black Harrier	<i>Circus maurus</i>	Vulnerable	Near Threatened
African Black Oystercatcher	<i>Haematopus moquini</i>	Near Threatened	Near Threatened
Chestnut-banded Plover	<i>Charadrius pallidus</i>	Near Threatened	Near Threatened
Caspian Tern	<i>Sterna caspia</i>	Least concern	Near Threatened
Half-collared Kingfisher	<i>Alcedo semitorquata</i>	Least concern	Near Threatened

http://www.birdlife.org.za/images/stories/conservation/Threatened_bird_species.pdf

Few South African fish species have been categorised according to IUCN criteria. Of the 41 fish species recorded in the Bot-Kleinmond Estuarine System (CSIR 2011), the Bot River klipfish *Clinus*

spatulatus is listed as Endangered (B1+2c ver 2.3) on the IUCN Red List, while the White steenbras *Lithognathus lithognathus* is listed as Lower Risk/conservation dependent (ver 2.3). Six other species - African mottled eel, Madagascar mottled eel, Estuarine roundherring, Lesser guitarfish, Flathead mullet and Freshwater mullet - are ranked Least Concern (ver 3.1). The Freshwater mullet *Myxus capensis* is also listed as Vulnerable in the South African Red Data Book for Fishes (Skelton 1987). Furthermore, of the exploited fish species in the system, all but one are either overexploited (below 40% of their historical reference point) or collapsed (<25%). Three of these – Dusky kob *Argyrosomus japonicus*, White Steenbras, *Lithognathus lithognathus* and Zebra *Diplodus cervinus* have been ranked in the top 20 fish in South Africa in terms of conservation importance (Lamberth & Joubert, in press).

In the case of amphibians, the Lamloch Swamps that form part of the Bot-Kleinmond Estuarine System support the endemic Microfrog *Microbatrachella capensis*, listed as Critically Endangered (B2ab(ii,iii) ver 3.1) in the IUCN Red List, as well as the Endangered Cape platanna *Xenopus gilli* (B1ab(I,iii) + 2ab(I, iii) ver 3.1) and Western leopard toad *Amietophrynus pantherinus* (B1ab(ii, iii, iv + 2ab(ii, iii, iv) ver 3.1) (Measey 2011).

The Ecosystem Threat Status for the Bot-Kleinmond Estuarine System is listed as Critically Endangered in South Africa's National Biodiversity Assessment 2011 (Van Niekerk & Turpie 2012).

Criterion 3: The predominant terrestrial ecosystem type within the proposed Ramsar site is Hangklip Sand Fynbos, listed as Endangered in the first national list of threatened terrestrial ecosystems for South Africa (Government Gazette 9 December 2011). Only 60% of the ecosystem's original area of 8 000 hectares remains, most of it situated in the Overstrand area. At least five endemic plant species and 32 Red Data List plant species occur in the ecosystem. The eastern shore of the Bot-Kleinmond Estuarine System supports the western-most extent of Elim Ferricrete Fynbos, which is Critically Endangered. It includes at least 72 Red Data plant species and 29 endemic plant species. Only 29% of the original 67 000 hectares remain. The north-eastern shore of the wetland system supports an isolated outlier of Critically Endangered Rûens Silcrete Renosterveld, which is known to include 13 endemic plant species and 26 Red Data List plant species. Only 14% of the original 21 000 hectares of this highly fragmented ecosystem remains. These ecosystem types fall within the Cape Sclerophyll biogeographic region which coincides with the Fynbos Biome of the Cape Floristic Region, recognised as one of the 34 terrestrial biodiversity hotspots identified worldwide. Their presence in the proposed Ramsar site clearly adds to its conservation value.

Eight estuarine habitat types are recognised in South Africa – water surface area; sand/mudflats/rock; macroalgae; submerged macrophytes; salt marsh; reeds and sedges; mangroves; and swamp forest. All but mangroves and swamp forest occur in the Bot-Kleinmond Estuarine System (CSIR 2011), and their total area is the largest for all estuaries in the transition zone between the warm and cool temperate biogeographic zones (Van Niekerk & Turpie 2012). The wetland is therefore important for maintaining biological diversity of the region.

Furthermore, 48% of the fish recorded in the Bot-Kleinmond Estuarine System are southern African endemics (Smith and Heemstra 1986).

Criterion 4: The Bot-Kleinmond Estuarine System is an important dry season refuge for ducks, geese and coots (Harebottle and Delport 2000), when breeding sites at temporarily inundated wetlands dry up. In addition, Spurwinged Geese *Plectropterus gambensis* that feed in the surrounding agricultural croplands use the estuary as a safe daytime refuge and moult site. The

southern African endemic Cape Shoveler, *Anas smithii* has been reported breeding at the estuary (Harebottle 2012).

The wetland supports seven fish species - dusky kob *Argyrosomus japonicus*, white steenbras *Lithognathus lithognathus*, leervis *Lichia amia*, Cape moony *Monodactylus falciformis*, flathead mullet *Mugil cephalus*, freshwater mullet *Myxus capensis* and Cape stumpnose *Rhabdosargus holubi* – that are dependent on estuaries as nursery areas for at least their first year of life (CSIR 2011).

Criterion 6: A total of 13 bird species reached global (Ramsar) population thresholds during the period 2002-2010. Four species - Great Crested Grebe, White-breasted Cormorant, Caspian Tern and Hartlaub's Gull - passed these levels on more than 10 occasions; Great Crested Grebe recorded globally important populations on 22 surveys (Harebottle 2012). The Botrivierlei & Kleinmond Estuary is recognized as an internationally Important Bird Area (IBA) (SA118).

Table 2: Species of waterbird at the Bot-Kleinmond Estuarine System meeting Ramsar's global 1% threshold level.

Species common name	Scientific name	Max. count	Ramsar 1% ¹
Caspian Tern	<i>Sterna caspia</i>	88	5.9% (13)
Greater Flamingo	<i>Phoenicopterus ruber</i>	2884	3.8% (7)
Great Crested Grebe	<i>Podiceps cristatus</i>	356	3.7% (22)
Swift Tern	<i>Sterna bergii</i>	704	3.5% (6)
Hartlaub's Gull	<i>Larus hartlaubii</i>	728	2.4% (12)
White-breasted Cormorant	<i>Phalacrocorax carbo</i>	247	2.1% (15)
Cape Shoveler	<i>Anas smithii</i>	720	2.1% (5)
Yellow-billed Duck	<i>Anas undulata</i>	2030	2.0% (3)
Red-knobbed Coot	<i>Fulica cristata</i>	15352	1.5% (3)
Black-necked Grebe	<i>Podiceps nigricollis</i>	199	1.3% (2)
Kelp Gull	<i>Larus dominicanus</i>	867	1.2% (1)
Sandwich Tern	<i>Sterna sandvicensis</i>	2059	1.2% (1)
Great White Pelican	<i>Pelecanus onocrotalus</i>	222	1.1% (1)

(Harebottle 2012)

¹ Figures represent the percentage of the estimated global or Southern African population based on the maximum count from 55 surveys carried out between February 2002 and February 2010. Numbers in parentheses represent the number of counts which met or surpassed the 1% threshold level. Calculated from Wetlands International (2006).

Criterion 7: Based on their distributional ranges given by Smith and Heemstra (1986), 20 (48 %) of the fish recorded in the Bot-Kleinmond Estuarine System are southern African endemics. Estuarine fish in South Africa are classified into five major categories of estuarine-dependence according to their life-history characteristics (Whitfield 1994). Representatives of all five categories (Table 3) occur in the Bot-Kleinmond Estuarine System (CSIR 2011). Since the system is an important nursery area, it supports a variety of life-history stages, and the fish species assemblage displays a range of reproductive strategies, including oviparous, ovoviviparous and viviparous, as well as mouth-brooding. The wetland is important for sustaining exploited fish stocks, which represents a significant wetland benefit. In South Africa there are 79 exploited fish species that have some association with estuaries (NBA 2011). Of these, 24 occur in the Bot-Kleinmond Estuarine System.

Criterion 8: A total of 41 fish species from 24 families have been recorded from the Bot-Kleinmond Estuarine System. Of these, 9 species breed in estuaries and 7 species are dependent on estuaries as nursery areas for their first year of life. The wetland accounts for 12% of the total estuarine fish

nursery area from False Bay to Port Alfred, representing more than 900 km of coastline.

A further 3 species of catadromous eel require estuaries as transit routes between the marine and freshwater environment. In addition, two species of mullet may be regarded as facultative catadromous species.

Table 3: the number of species in the Bot-Kleinmond Estuarine System in each of the five major categories of fishes that utilize South African estuaries (Adapted after Whitfield 1994) – **NOTE: NUMBERS TO BE CHECKED BY STEVE LAMBERTH.**

Categories	Description of categories	Number of species
I	Estuarine species that breed in southern African estuaries:	
	Ia. Resident species breed only in estuaries	2 2
	Ib. Resident species that also have marine or freshwater breeding populations.	6 7
II	Euryhaline marine species that usually breed at sea with the juveniles showing Varying degrees of dependence on southern African estuaries:	
	IIa. Juveniles dependent on estuaries as nursery areas.	8 7
	IIb. Juveniles occur mainly in estuaries but are also found at sea.	5 5
	IIc. Juveniles occur in estuaries but are usually more abundant at sea	3 5
III	Marine species that occur in estuaries in small numbers but are not dependent	3 8
IV	Euryhaline freshwater species, whose penetration into estuaries is determined by salinity tolerance. Includes some species that may breed in both freshwater and estuarine systems	
	IVa. Indigenous	3 1
	IVb. Translocated from within southern Africa	2 1
	IVc. Alien	2 1
V	Catadromous species that use estuaries as transit routes between the marine and freshwater environments:	
	Va. Obligate catadromous species that require a freshwater phase in their development	1(3) 3
	Vb. Facultative catadromous species that do not require a freshwater phase in their development	2 2

The Ecological Water Requirements study (CSIR 2011) for the Bot-Kleinmond Estuarine System, conducted according to the Resource Directed Measures methodology, allocated the following

Functional Importance scores (out of 100) to the wetland:

- Nursery function for fish and crustaceans (marine/riverine) 90
- Movement corridor for river invertebrates and fish breeding in sea 60

Criterion 9: The wetland supports more than 1% of the global population of the Endangered Bot River Klipfish *Clinus spatulatus*, the distribution of which is confined to the Bot-Kleinmond Estuarine System and neighbouring Klein River Estuary. It is the only truly estuarine member of the genus. The population in this system varies between 1.6 and 1.8 million (unpublished DAFF data, Lamberth, pers comm.). In addition the surrounding wetlands supports more than 1% of the global population of the Critically Endangered micro frog *Microbatrachella capensis*, which occurs in only four isolated locations totalling an area of 7 km² (Measey 2011) as well as more than 1% of the Cape Platanna *Xenopus gilli*.

15. Biogeography (required when Criteria 1 and/or 3 and /or certain applications of Criterion 2 are applied to the designation):

a) **biogeographic region:**

Terrestrial: Africotropical Realm: Fynbos Region: Lowland Fynbos and Renosterveld (Ecosystem code AT1202), and adjoining Montane Fynbos and Renosterveld (Ecosystem code AT1203).

Marine: Temperate Southern Africa Realm: Agulhas Province (51): Agulhas Bank (192).

Estuarine: Cool to Warm temperate transition zone.

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

Terrestrial: Olson, D.M., E. Dinerstein, E.D. Wikramanayake, N.D. Burgess, G.V.N. Powell, E.C. Underwood, J.A. D'Amico, I. Itoua, H.E. Strand, J.C. Morrison, C.J. Loucks, T.F. Allnutt, T.H. Ricketts, Y. Kura, J.F. Lamoreux, W.W. Wettengel, P. Hedao, and K.R. Kassem. *Terrestrial Ecoregions of the World: A New Map of Life on Earth*. BioScience 51:933-938.

Marine: Spalding MD, Fox HE, Allen GR, Davidson N, Ferdaña ZA, Finlayson M, Halpern BS, Jorge MA, Lombana AI, Lourie SA, Martin KD, Mcmanus E, Molnar J, Recchia CA & Robertson J 2007. *Marine Ecoregions of the World: A Bioregionalization of Coastal and Shelf Areas*. BioScience Vol. 57 (7): 573 - 583

Estuarine: Turpie, J.K., Wilson, G. & Van Niekerk, L. 2012. National Biodiversity Assessment 2011: National Estuary Biodiversity Plan for South Africa. Anchor Environmental Consultants Report No AEC2012/01, Cape Town. Report produced for the Council for Scientific and Industrial Research and the South African National Biodiversity Institute.

16. Physical features of the site:

The Bot-Kleinmond Estuarine System is classified as an estuarine lake (Van Niekerk & Turpie 2012) and represents a palaeo-valley drowned by sea level rise (Rogers 1985). The wetland is underlain by deeply weathered Bokkeveld Shales and flanked by mountains. The main Bot Estuary, oriented perpendicular to the coastline, is connected to the smaller Kleinmond Estuary, oriented parallel to the coastline behind a densely vegetated barrier dune up to 17 m high. The two estuaries are linked by a natural overflow channel into the adjoining Lamloch Swamps when water levels reach 1.7 m

MSL.

The lower sand berm at the Kleinmond Estuary mouth (2.5 m MSL) means that this estuary typically breaches first, causing water to drain from the Bot Estuary at a rate of about 310 000m³ per day, or approximately 11 cm per week (Willis 1985). As a result, the Bot Estuary rarely opens naturally and requires artificial breaching every few years to maintain its estuarine functioning. The artificial breaching is conducted according to strict criteria for salinity, water level and timing. It results in a deep tidal mouth of 80-110 m wide and - 2.0 to -2.5 m MSL deep, which typically stays open for two to four months, but has recently stayed open for 10 months (Aug 2013-June2014).

The mean depth of the Bot River Estuary is -1.5 meters MSL. Depending on the water level, the deepest areas may be up to 6 m deep. Water levels in the estuary vary seasonally, as the estuary fills with runoff from winter rains and then declines during the summer due to evaporation and seepage. As a result, salinity also varies seasonally, declining in the winter rainfall months and increasing again in summer due to evaporation, sometimes becoming hypersaline. There is a progressive reduction in salinity from year to year if the mouth remains closed, necessitating artificial breaching if the salinity falls below 6 ppt to avoid mass mortalities of estuarine biota.

The berm height of the Bot Estuary is approximately 3 m MSL, coinciding with a water volume of about 45 million m³ for a 'full' estuary, but artificial breaching typically takes place at 2.5 – 2.8 m MSL. After breaching the water level decreases to 0.0 MSL within 12 hours and the estuary becomes tidal. The shallowness of the estuary results in considerable mixing of the water through wind-driven turbulence, and physical conditions are comparatively uniform throughout the lagoon. The constant sediment disturbance means that the water is usually muddy and turbidity high.

Sediments in the southern third of the estuary consist almost entirely of sand, and over the whole estuary all sediments above mean sea-level are composed of >70 % sand, with the exception of those at the northernmost end. The sediments in the deeper parts of the estuary are composed of more than 90% mud. There is a marked lack of very fine sand in the estuary, and the mean particle size is medium sand. The sands consist mainly of quartz, except in the lower reaches near the sea where they contain a high proportion of shell fragments (Willis 1985).

17. Physical features of the catchment area:

The Bot River Estuary is fed by the Bot and Afdaks Rivers, with a combined catchment area of approximately 905 km². The Kleinmond Estuary is fed by the Lamloch and Isaacs Rivers, with much smaller catchments, as well as being linked to the Bot Estuary at water levels over 1.7 m MSL. Runoff from the catchment is estimated at 47 million m³ (CSIR 2011).

The catchment is in a winter rainfall area with mean annual rainfall varying between 400 and 600 mm. Dryland agriculture (wheat) is the predominant land use, but there is some commercial irrigated agriculture (citrus, grapes). However, much of the catchment is mountainous and covered in shrubland and fynbos (CSIR 2011)

The catchment of the Bot River Estuary is dominated by sedimentary rocks of the Bokkeveld Group although on both its western and eastern borders some Table Mountain Sandstone (TMS) is present. The Bokkeveld Shales produce waters unstained by humic acid and the Bot Estuary has "white" or "turbid" waters. The pH in its rivers is characteristically alkaline, while the two rivers that feed the Kleinmond Estuary flow over TMS, are deeply stained with humic acids, and have a pH of between 3.6 and 4 (Koop 1982).

18. Hydrological values:

The cyclic nature of the hydrological processes taking place in the Bot-Kleinmond Estuarine system during alternating closed (high water/full) and open (low water/empty) estuary mouth scenarios has value in the following ways:

- Under closed mouth conditions the rising water level (in winter)
 - recharges groundwater;
 - raises the water table in the adjacent Lamloch Swamps, which is important for sustaining habitat for amongst others, the critically endangered Microfrog;
 - dilutes and removes excess nutrients and other pollutants;
 - helps regulate both, destructive flash flooding and loss of ecosystem functioning and species die off during the drier summer season.
- Under open mouth conditions the flushing of the estuary and sudden increase in salinity
 - flushes out sediments that have built up under closed conditions;
 - flushes out and causes die off of alien fish species eg Carp (*Cyprinus carpio*);
 - causes a die-back of the lower fringes of encroaching phragmites reed beds;
 - causes an influx of estuarine dependent fish, wading birds and species which prefer the lower water and more saline conditions.
- Riparian vegetation cover
 - prevents soil erosion along the banks of wetland and estuary;
 - breaks wave action in times of high waters driven by strong winds;
 - attenuates floods;
 - retains water during the drier summer season.

19. 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 • ~~X~~
Vt • W • Xf • Xp • Y • Zg • Zk(b)

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

b) dominance: F, G, H

20. General ecological features:

The Bot-Kleinmond Estuarine System supports the following estuarine habitat types – water surface area; sand/mudflats/rock; macroalgae; submerged macrophytes; salt marsh; and reeds and sedges. The dominant macrophyte is *Ruppia maritima*, representing 87% of total submerged macrophyte area. The *Ruppia* beds are an important food source for fish and coots, and have diverse faunal communities associated with them. When the mouth breaches, 60 to 80 % of these beds are lost through exposure, but after mouth closure they proliferate and reach maximum biomass after 9 months. By contrast, salt marsh expands rapidly into exposed areas when water level drops, and dies back when inundated for more than three months under closed conditions. Their decomposition favours the growth of filamentous macroalgae, leading to localised blooms. Reeds and sedges expand at sites of freshwater seepage when water level is low and under nutrient input.

Of the 86 species of waterbirds recorded at the wetland, 33 are invertebrate-feeding waders, 18 are piscivores and 14 are waterfowl. There are 12 species of wading birds and 9 pursuit-swimming piscivores. The bird community changes markedly from year to year according to the estuarine cycle brought about by breaching (Table 4). Overall bird abundance is determined mainly by the presence and absence of Red-knobbed Coots (*Fulica cristata*), since these occur in extremely high numbers when present (CSIR 2011).

Table 4: Types of birds favoured by different conditions in the Bot River estuary (CSIR 2011)

Lake condition	Breached estuary Intertidally exposed areas	Filling lake Intermediate water levels	Full lake Deep water, abundant macrophytes
Types of birds favoured	Waders, gulls and terns	Flamingos, wading birds	Waterfowl and piscivores
Example species	<ul style="list-style-type: none"> ● Curlew ● Sandpiper ● Kittlitz Plover ● Common Tern ● Hartlaub's Gull 	<ul style="list-style-type: none"> ● Greater Flamingo ● Black-winged Stilt ● Sacred Ibis ● Grey Heron ● Egrets 	<ul style="list-style-type: none"> ● Red-knobbed Coot ● Great Crested Grebe ● Southern Pochard ● Yellow-billed Duck ● Red-billed Teal ● Reed Cormorant

The fish assemblage of the wetland is dominated numerically by estuary-breeders and subject to highly variable recruitment by estuary-dependent marine species. Survival of the latter has been severely compromised by illegal netting, so their contribution to the fish assemblage remains low (CSIR 2011). However, the wetland's contribution to marine fisheries in terms of its nursery function has been valued at an estimated R20-50 million per year. The illegal netfish catch, which predominantly comprises the harder or southern mullet *Liza richardsonii*, accounts for the wetland being ranked the 6th most important temperate estuary in the country in terms of subsistence value, estimated at R0.1-0.5 million per year (Turpie and Clark 2007).

 21. Noteworthy flora:

The proposed Ramsar site has also been identified as a Critical Biodiversity Area (CBA) in the Overberg Biodiversity Assessment 2010. The CBAs are areas of land as well as aquatic features which must be safeguarded in their natural state if biodiversity is to persist and ecosystems are to continue functioning. CBAs incorporate: (i) areas that need to be safeguarded in order to meet national biodiversity thresholds (ii) areas required to ensure the continued existence and functioning of species and ecosystems, including the delivery of ecosystem services; and/or (iii) important locations for biodiversity features or rare species.

Rare and noteworthy plant species.

Scientific name	National Red List Category
<i>Xiphotheca reflexa</i>	Endangered
<i>Acrodon subulatus</i>	Endangered
<i>Otholobium pungens</i>	Endangered
<i>Cyrtanthus leucanthus</i>	Endangered
<i>Muraltia bolusii</i>	Endangered
<i>Lachenalia lactosa</i>	Endangered
<i>Lachnaea densiflora</i>	Near Threatened
<i>Phylica plumosa</i>	Endangered
<i>Leucospermum prostratum</i>	Vulnerable
<i>Leucadendron linifolium</i>	Vulnerable
<i>Babiana purpurea</i>	Endangered
<i>Geiisshoriza tenella</i>	Vulnerable
<i>Agathosma hookeri</i>	Rare
<i>Moreaea tricolor</i>	Endangered
<i>Lampranthus bicolor</i>	Vulnerable
<i>Ixia putens</i>	Endangered
<i>Moraea versicolor</i>	Vulnerable

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. 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.*

Summer and winter bird counts conducted between 2002 and 2010 yielded a maximum count of 17 300 birds, with a mean of 4558 ± 2664 in summer and 5265 ± 2759 in winter. Red-knobbed Coot, Common Tern and Sandwich Tern were numerically the most abundant species. However, Red-knobbed Coot favour lake conditions that occur with long periods between estuary breaching. Since the current estuary management policy advocates more frequent breaching, the species' numbers declined by 99% between 2002 and 2010 (Harebottle 2012). Earlier research had estimated that the species removes and recycles as much as 10% of the submerged macrophytes annually through feeding and nest-building (Stewart and Bally 1985).

The system is of importance to the regional population of the near-threatened Greater Flamingo, with up to 2884 birds recorded in summer and up to 1619 in winter. In summer the estuary can attract a variety of Palearctic migrants (15 recorded species) which can occur in high numbers. For example, Little Stint was recorded regularly in summer and in numbers exceeding 500 individuals (CSIR 2011).

Between 2002 and 2012 the Bot-Kleinmond Estuarine System supported 34 bird species whose maximum counts represented 5% or more of the estimated populations for each species in South Africa's Western Cape Province; four of these species contributed more than 20%: Sandwich Tern (49.8%), Great Crested Grebe (26.6%), Southern Pochard (23.5%) and Red-knobbed Coot (20.6%) (Harebottle 2012).

In terms of noteworthy fish, the system's population of estuarine round herring *Gilchristella aestuaria* is considered the most genetically isolated one of the species along the South African coastline (Norton 2005). This can be at least partly explained by its life-history characteristics (estuarine spawner with no marine phase), but also by the fact that fish recruitment into Walker Bay and its estuaries is limited compared to other bays in South Africa, mostly due to its relative isolation and currents bypassing the bay as they are deflected further out to sea (CSIR 2011).

A total of 41 fish species from 24 families have been recorded from the Bot-Kleinmond Estuarine System. Of these, 9 species breed in estuaries and 7 species are dependent on estuaries as nursery areas for their first year of life. The wetland accounts for 12% of the total estuarine fish nursery area from False Bay to Port Alfred, representing more than 900 km of coastline.

A further 3 species of catadromous eel require estuaries as transit routes between the marine and freshwater environment. In addition, two species of mullet may be regarded as facultative catadromous species.

The wetland supports more than 1% of the global population of the Critically Endangered Bot River klipfish *Clinus spatulatus*, the distribution of which is confined to the Bot-Kleinmond Estuarine System and the neighbouring Klein River Estuary. It is the only truly estuarine member of the genus. The population in the Bot-Kleinmond Estuarine System varies between 1.6 and 1.8 million (unpublished DAFF data, Lamberth, pers comm.).

Three alien fish species occur in the estuary: largemouth bass (*Micropterus salmoides*), carp (*Cyprinus carpio*) and the translocated southern African endemic Mozambique tilapia

(*Oreochromis mossambicus*).

The Lamloch Swamps supports approximately 25 feral horses in two to three herds. The horses have become a tourist attraction at Roosands Nature Reserve. Cape Clawless otter (*Aonyx capensis*), Honey badger (*Mellivora capensis*), and Lynx (*Caracal caracal*) all having the status of species of Least Concern with the IUCN occur on the site.

23. Social and cultural values:

a) Describe if the site has any general social and/or cultural values e.g., fisheries production, forestry, religious importance, archaeological sites, social relations with the wetland, etc. Distinguish between historical/archaeological/religious significance and current socio-economic values:

The surrounding communities of Kleinmond, Fisherhaven and Hawston have a close relationship with the Bot River Estuary. Many residents and holiday makers utilize the estuary for various reasons, ranging from fishing, to swimming to launching of boats at Fisherhaven slipway.

An area known as “Die Eiland”, near Middelvlei Estate, has been a traditional camping site for the Hawston community during the Easter and festive season for a number of years. This site is however undeveloped with no infrastructure as yet.

Incidents of illegal gill netting in the estuary have negatively impact upon subsistence fishing in the area as there is limited control measures at the Fisherhaven slipway and thus boats have unrestricted access to the estuary. The surrounding communities are divided in the management of the estuary objectives in favour of the own needs, e.g. recreation, fishing, income, aesthetics.

The estuary is surrounded by high valued properties such as Arabella Country Estate and Benguela Cove. These properties employ people from the local community therefore creating temporary and permanent work.

b) Is the site considered of international importance for holding, in addition to relevant ecological values, examples of significant cultural values, whether material or non-material, linked to its origin, conservation and/or ecological functioning?

No – not applicable.

If Yes, tick the box and describe this importance under one or more of the following categories:

No – not applicable.

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:
- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

a) within the Ramsar site: As regards this phase (Phase 1) of the application, the entire estuary water body is in State ownership as is the adjacent Rooisand Nature Reserve.

b) in the surrounding area: The surrounding land which will be included in Phase 2 is either in private ownership or in State ownership.

25. Current land (including water) use:

a) within the Ramsar site:

Terrestrial: Rooisand Nature Reserve. Conservation and recreation including horse riding, hiking and birding.

Aquatic: Bot River Estuary water body: Recreation on the water includes swimming, boating (motor and oars), powerboating, waterskiing, wakeboarding, yachting/sailing, kite surfing, windsurfing, kayaking/canoeing, surfing and birding while both subsistence and recreational fishing occurs. No commercial activities take place in or on the water body of the estuary, although there has been plans for ferries and houseboats in the past.

b) in the surroundings/catchment: Commercial enterprises include mainly those based on tourism, property development and sport (golf and horse trails). Agricultural in the form of cattle, dairy, canola, wheat and olives and horse farming take place mostly upstream of the R43 road bridge where the Bot River Brick Works and associated quarry is also situated. Sand mining activities take place close to the brick works on the R43 as well and there are a number of rehabilitated sand mines on the western bank near the Rooisand Nature Reserve.

Major property developments include the Arabella Country Estate (golf estate) and the wine/olive estate at Benguela Cove. The catchment also has conservation, forestry, and the towns of Fisherhaven, Hawston, Kleinmond, Botriver and Caledon with their associated industries. The Theewaterskloof Municipality has identified the town of Botrivier as "ideally located to become the industrial hub of the Overberg". Limited overnight accommodation (lodges, B&Bs and self-catering facilities) are available at Middelvlei and Fisherhaven with some located closer to the R43/R44 intersection. There are a number of dams in the catchment. Recreation includes birding, sport and recreation (golf and fishing).

26. 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 estimated 25% reduction in mean annual runoff due to Invasive Alien Plants as well as the encroachment of Invasive Alien Plant species pose the biggest threat to the Estuary. Development pressure in the catchment towns of Botriver, Caledon and Fisherhaven/Hawston and Kleinmond pose the potential for pollution pressures from overextended sewerage works while insensitive agricultural practices resulting in a loss of riparian habitat and siltation is another potential threat.

Pressure for use of natural resources such as illegal fishing practices (gill netting) poses a threat to the nursery function of the estuary, as does the presence of alien fish. Indiscriminate and unplanned illegal breaching of the Estuary at both Kleinmond and Meerensee could also severely impact on the functioning of the system.

b) in the surrounding area: A tremendous amount of pressure is placed on the natural

resources of the area due to the increasing human population, encroachment and development. Agriculture in the surrounding area, as well as the growth of urban areas and their associated waste water could adversely affect the water quality of the Estuary. In addition, the future expansion of the Arabella Country Estate could pose a further potential threat to the Estuary.

27. Conservation measures taken:

a) List national and/or international category and legal status of protected areas, including boundary relationships with the Ramsar site:

In particular, if the site is partly or wholly a World Heritage Site and/or a UNESCO Biosphere Reserve, please give the names of the site under these designations.

The terrestrial portion of the Site, Rooisand Nature Reserve (RNR), was established as a provincial nature reserve in terms of Section 6 of the Nature Conservation Ordinance, 1974, on 25 October 2002 and proclaimed in the Provincial Gazette of 20 November 2002 by Proclamation No. 21/2002. This reserve forms part of the Kogelberg Nature Reserve Complex and falls within the existing Boland Mountain Complex which is one of eight sites, registered with UNESCO in 2004, as the Cape Floral Region Protected Areas World Heritage Site. The Kogelberg Biosphere Reserve (KBR) was registered with UNESCO in 1998 and was South Africa's first Biosphere Reserve. Being formally protected the RNR also falls within the KBR's Core.

The Aquatic portion of the site, the Bot River Estuary lies adjacent to the World Heritage Site and falls within the Buffer of the KBR.

b) If appropriate, list the IUCN (1994) protected areas category/ies which apply to the site (tick the box or boxes as appropriate):

Ia ; Ib ; II ; III ; IV ; V ; VI

c) Does an officially approved management plan exist; and is it being implemented?:

An officially approved management plan exists for both the terrestrial (Kogelberg Nature Reserve Complex Management Plan 2013-2018) and Aquatic portions (Bot/Kleinmond Estuarine System Management Plan 2009-2014).

d) Describe any other current management practices:

Terrestrial: The RNR is managed by CapeNature and has a number of current interventions including alien vegetation management, fire management, maintenance of existing infrastructure and monitoring.

The area of Rooisand Nature Reserve is 300ha. Some parts of the reserve is heavily infested with alien vegetation, however these areas are being cleared as part of the APO.

Aquatic: The Bot River Estuary was previously managed by the Overberg District Council until this responsibility was delegated to the Overstrand Municipality (OM) who have by-laws dictating its zonation and use. The Bot River Estuary Advisory Committee (BREAC) which consisted of all Interested and affected parties around the estuary was replaced by the Bot River Estuary Forum (BREF) in 2010. The Estuary Management plan (EMP) which was drafted in 2009 spells out the management of the estuary water body. The OM have also, in consultation with the BREF put together a mouth management plan which is revised every 5 years and dictates under what conditions an artificial breaching is considered.

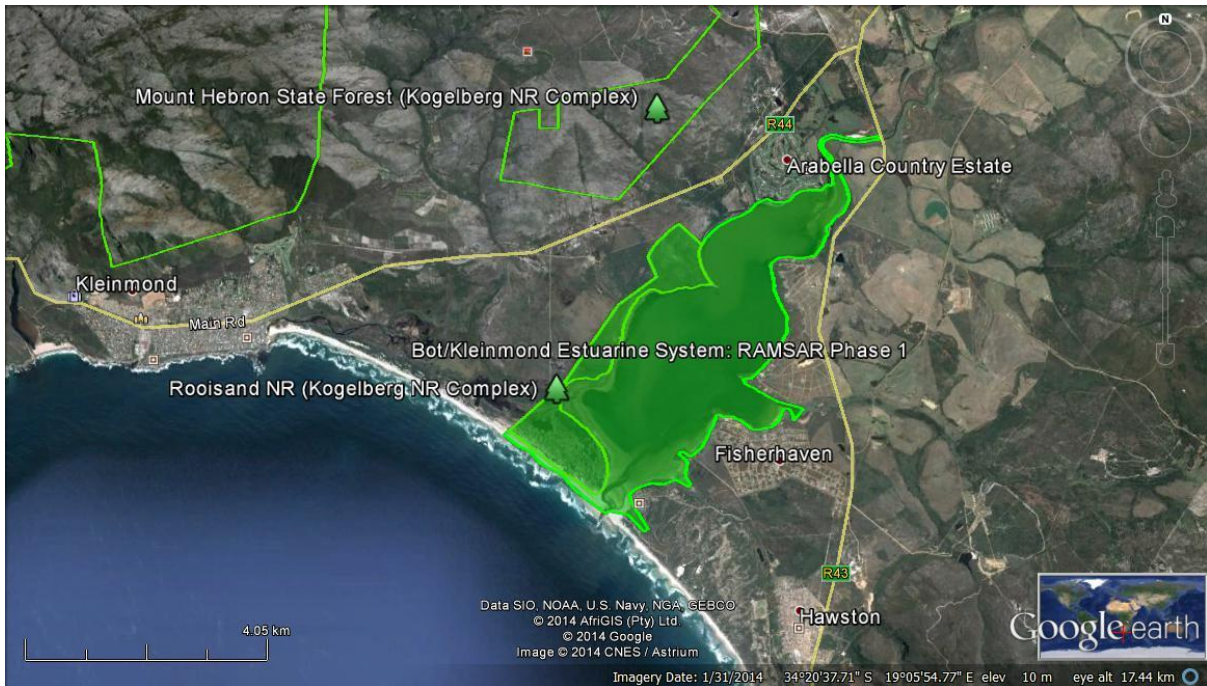
The salinity monitoring of the Bot River Estuary is done on a monthly basis which includes shore based salinity monitoring, water level monitoring and river mouth condition. The 8 salinity readings and 2 water level readings are taken at Ysterklip and Kleinmond mouth. This information assists in the decision making process of how often and when the estuary should be or will be breached.

Bi-monthly water quality sampling is done at four sites which include two sites at the Palmiet River, one site at the Kleinmond River mouth and one at Fisherhaven.

28. Conservation measures proposed but not yet implemented:

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

All conservation measures proposed and planned for the site are spelled out in the two management plans. Currently the priority is to have the Estuary, both the water body and adjoining Rooisand Nature Reserve, registered under the Ramsar Convention as a wetland of International Importance. The management plans mentioned earlier cover the areas proposed in both the first and second phase of a this two phased Ramsar application. Once the first phase has been registered, commencement with the second phase will begin.



Ramsar Application: Phase 1: Including the terrestrial (Rooisand Nature Reserve) and aquatic (Bot River Estuary Main Water Body) portions of State Land - this application.

Ramsar Application: Phase 2: Including a terrestrial (adjacent private and state land) and aquatic (Lamloch wetlands - private land) portions. Due to the fact that these landowners have yet to be consulted regarding this phase of the application and as a result no map could be included here.

29. Current scientific research and facilities:

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

There is no field research station at the site. However, several research and biodiversity monitoring projects have been running at the Bot-Kleinmond Estuarine System. For example, a long term study on the fish diversity of the Bot-Kleinmond Estuarine System has been conducted by Lamberth and Joubert (in prep) where the system has been surveyed twice a year over a period of ten years.

Furthermore, summer and winter Coordinated Waterbird Counts (CWAC) have been done since 1993 on the Bot-Kleinmond Estuarine System. The data is housed at the Animal Demography Unit (ADU) at the University of Cape Town.

In addition, the nutrient levels, salinity and water levels of the Bot-Kleinmond Estuarine System are monitored on a monthly basis to inform the Estuary mouth management as per management plan.

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

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

There is a number of access points around the Estuary with interpretative signage boards and the entrance to the boardwalk at Rooisand Nature Reserve also caters for visitor interpretation. Other sites include the public slipway at Fisherhaven, Meerensee, Arabella, and the Kleinmond footbridge.

As previously mentioned the Estuary is a popular birding destination and forms part of the Overberg Birding Route <http://www.birdlife.org.za/conservation/important-bird-areas/iba->

[directory/item/260-sa118-botriviervlei-kleinmond-estuary](#) while the Birds in Reserves Project, an Animal Demography Unit initiative has a Bird species list available at:
http://birp.adu.org.za/site_summary.php?site=34211906.

A number of websites exist which gives the public access to information regarding the Estuary and its management. Included are links to the following sites:
Whale Coast Conservation, a local Non-Government Organisation, are currently busy with a number of Environmental Education initiatives in the area.
http://www.whalecoastconservation.org.za/reference/20/2/Estuary_Management

The Kogelberg Biosphere Reserve Company has a website at www.kogelbergbiospherereserve.co.za. which gives information about the Estuary as does the local Friends of the Bot River Estuary (BotFriends) <http://www.botfriends.org.za>

31. Current recreation and tourism:

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

The waterbody is used for boating, sailing, waterskiing and fishing. Its shoreline is popular for relaxation, walking and bird-watching, while the shallows are popular for swimming . A hotel and golf estate are situated on the north western shore while a hiking trail, sports events and birding are a popular activities at Rooisand Nature Reserve.

32. Jurisdiction:

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

Territorial:

The Department of Environmental Affairs,
Environment House,
Private Bag X447
Pretoria
0001
South Africa:
www.environment.gov.za

Functional:

The Western Cape Nature Conservation Board(CapeNature),
Private Bag x29,
Gatesville,
7766,
Cape Town,
South Africa.
www.capenature.co.za

Overstrand Municipality,
PO Box 20,
Hermanus,
7200:
South Africa.
www.overstrand.gov.za

33. Management authority:

Provide the name and address of the local office(s) of the agency(ies) or organisation(s) directly responsible for managing the wetland. Wherever possible provide also the title and/or name of the person or persons in this office with responsibility for the wetland.

The Reserve Manager, Kogelberg Nature Reserve Complex, CapeNature, Private Bag X1, Kleinmond, 7195. South Africa www.capenature.co.za	and	The Program Manager, Marine Protected Areas, Islands & Estuaries, CapeNature, Private Bag X5014 Stellenbosch, 7599 South Africa
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The Senior Manager,
Environmental Management Services,
Overstrand Municipality,
PO Box 20,
Hermanus,
7200,
South Africa
www.overstrand.gov.za

34. Bibliographical references:

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

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