

DE MOND NATURE RESERVE (HEUNINGNES ESTUARY)

1. DATE OF UPDATE

June 1998

2. COUNTRY

South Africa

3. NAME OF WETLAND

De Mond (Heuningnes Estuary)

4. GEOGRAPHICAL CO-ORDINATES

South: 34° 43"

East: 20° 07"

5. ALTITUDE

Min: 0 m

Max: 30 m

6. AREA (ha)

918 ha

7. OVERVIEW OF SITE

The Heuningnes Estuary extends approximately 12 km across the flat coastal plain of the Zoetendals Valley farm area. It is however only the lower 2 km stretch which shows the proper characteristics of a proper estuary. The estuary breaks out to the sea through a double dune ridge at the De Mond Forestry Station.

8. WETLAND TYPE

E Sand, shingle or pebble shores

F Estuarine waters

G Intertidal mud and sand flats

M Permanent river

9. RAMSAR CRITERIA

1b, 2a, 2b

10. MAP OF SITE INCLUDED

No as it is the same as the original application.

11. NAME AND ADDRESS OF COMPILER

Mr. K.A. Shaw
Cape Nature Conservation
Private Bag X 5014
STELLENBOSCH
7599
South Africa

12. JUSTIFICATION

The main motivation for registration of this wetland is the importance of the area for the continued existence of the Damara Tern (*Sterna balaenarum*). This species is listed as Rare, (Brooke, 1984) and is possibly the rarest resident sea bird in South Africa (Cooper 1983). It is endemic to southern Africa.

The De Mond area is one of the very few confirmed breeding areas of this species and is one of only two breeding sites in South Africa falling within a Nature Reserve (Cooper 1983).

It is estimated that about 15 % of the national population of this species can be found in this wetland area (Cooper pers. comm.).

The dune areas and pebble slacks of the beaches to the NE and SW of the estuary are suitable for nesting sites while the estuary is a vital foraging ground for the birds and is used as a meeting ground during pair formation.

The Caspian Tern (*Hydroprogne caspia*) according to Bickerton (1984) also uses this area as a breeding area. This species is classified as Rare in the SA Red Data Book Aves (Brooke, 1984).

A large colony (\pm 300 pairs) of Kelp Gulls (*Larus dominicanus*) breed in the reserve, several African Black Oystercatchers (*Haematopus moquini*) and Blue Crane (*Anthropoides paradisea*) nests have also been reported in the area (Bickerton, 1984).

The Heuningnes estuary is the most southerly estuary in Africa and is therefore scientifically important for species distribution extremities. Three tropical species, the Ginger Prawn (*Penaeus japonicus*), the Giant Mud Crab (*Scylla serrata*), both crustaceans, and a tropical gastropod, *Nerita albicilla*, have been recorded in this estuary. These are the southernmost distribution records for these species.

13. GENERAL LOCATION

The nearest town, Bredasdorp is 25 km from the Ramsar site. The Indian Ocean forms the southern boundary of the Ramsar site, while agricultural lands adjoin the northern, eastern and western boundaries of the site.

14. PHYSICAL FEATURES

14.1 Geology and geomorphology

The geology of the upper catchment of the Kars River is dominated by Table Mountain Group sandstone, quartzite as well as shale's of the Heuningberg mountain, near Bredasdorp in the south and Bokkeveld shale's in the undulating northern areas. Further downstream, east of Bredasdorp, the river transverses calcified dune sand and coastal limestone of the Bredasdorp Beds.

Sandstone, quartzite and shales of the Table Mountain Group dominate the geology of the upper catchment of the Nuwejaars River. Post Malmesbury, pre-Cape granite outcrops occur on the south facing slopes of the Heuningnes Mountain. Further downstream near Elim, the Nuwejaars River transverse shale and sandy shale of the Bokkeveld Group, which persists eastwards almost to where, the Nuwejaars River enters Zoetendalsvlei.

There are two fault lines running almost east/west, one just south of the Heuningnes mountain and the other just north of Soetany'sberg further south.

From Soetendalsvlei and Nachtwacht almost to the mouth of the Heuningnes River, the drainage system transverses calcified dune sand and coastal limestone of the Bredasdorp Beds. Approximately 2 km from the mouth, the Heuningnes estuary is situated on unconsolidated sand.

14.2 Origins

The development of the area took place during the Tertiary and Recent (that is, during the past 70 million years) periods, beginning with prolonged erosion, after which the ocean covered most of the area underlain by Bredasdorp Beds which consist of calcified dune sand. These occur along the whole coast up to the Potberg Mountain in a band varying from three to

twenty kilometres in width. During the Miocene (26 to 7 million years ago) the ocean began to retreat and on this wavecut platform the Bredasdorp Beds were left as inshore deposits. The beach sand was blown up into dunes that crossed the former extension of the ocean. Subsequently the sea level rose again and a platform was cut over Bredasdorp and older formations. As the sea retreated again, the beach sand was blown up into dunes locally on this younger marine terrace. Still later the sea level sank further, due to worldwide glaciation and another terrace was formed. Its maximum height is 7 m and it is preserved only in patches along the coast.

Greater resistance to weathering processes has left the Table Mountain Sandstone as the most prominent feature in the landscape, forming high ground and mountain ranges. The less resistant shales have weathered resulting in the round hilly nature of the Bokkeveld shales in the undulating country in the upper reaches of the Heuningnes catchment.

14.3 Hydrology

Salinity varies between seasons and tides. During the winter the river comes down in flood and the water in the estuary becomes almost fresh while during summer because of the low flow seawater penetrates into the estuary.

14.4 Soil type and chemistry

N/A

14.5 Water quality

Monthly pH values at three sampling stations in the Heuningnes Estuary were in the range of 8,0 to 8,6. Most of the readings were fairly consistent between 8,2 and 8,4, which is close to the normal pH value of seawater.

Water temperature: The following means were determined from data:

<u>Summer</u>	<u>Autumn</u>	<u>Winter</u>	<u>Spring</u>
19,8 °C	17,5 °C	13,3 °C	17.3 °C

Secchi disc measurements taken along the length of the estuary show a high degree of turbulence indicating the strong influence of the sea high up into the estuary.

14.6 Depth, fluctuations and permanence of water

Min: 0,5 m
Max: 2.5 m

Daily fluctuations due to tidal influence as well as seasonal influence caused

by high and low flows occur in the estuary. Water occurs throughout the year in the estuary, as it is permanently open.

14.7 Tidal variations

Highest Astronomical Tide	2,42
Lowest Astronomical Tide	0,01
Mean High Water Springs	2,00
Mean Low Water Springs	0,25
Mean High Water Neaps	1,41
Mean Low Water Neaps	0,84
Mean Level	1,13

14.8 Catchment area

The effective catchment area is 1 185 km².

14.9 Downstream area

The estuary opens into the Indian Ocean.

14.10 Climate

The Heuningnes river and its catchment lie within a Mediterranean climatic region, receiving most of the rainfall in the winter from about May to September and characterised by a warm to hot and dry summer. The mean annual rainfall over most of the catchment is between 400 and 600 mm, with a mean annual precipitation of 447 mm for the Heuningnes drainage system.

Average daily temperatures:

	Max (°C)	Min (°C)
January	28	15
July	17	6

Sunshine duration varies from about 60 % of the possible duration in July to over 70 % in January.

15. HYDROLOGICAL AND BIOPHYSICAL VALUES

Unknown

16. ECOLOGICAL FEATURES

Habitat within the Ramsar site can be broadly classified into three broad types, the estuary and associated river system, the dunes system and associated pebble slacks and vegetated areas. According to Acock's (1953) the vegetation of the area is classified as Coastal Macchia. Heydorn and Tinley (1980), however, describe the vegetation of the area as Dune Thicket and Coastal Heath, while Moll *et al.* (1984) describe it as South Coast Strandveld, being an open to closed (40 - 80% canopy cover) mid-high vegetation with evergreen and deciduous broad-leafed and less conspicuous succulent elements. Graminoid components and herbaceous species form the understorey.

In the past exotic plants (*Acacia cyclops* and Marram grass *Ammophila arenaria*) were introduced to stabilize the shifting dunes. Marram grass is a pioneer species and disappears as soon as competition from other plants increases. The *Acacia* on the other hand is highly invasive and has been removed.

17. NOTEWORTHY FLORA

Bickerton (1984) described the vegetation of the wetland in some detail and the following description is mainly summarized from this work.

17.1 Algae

No information is available but filamentous green algae (*Enteromorpha linga* and other *Enteromorpha* species.); an *Ulva* species as well as an *Arthrocarcia* species have been reported from this area (Mehl 1974).

17.2 Aquatic Angiosperms

Owing to the turbidity of the water, aquatic plants are sparse. A *Ruppia* species does however occur in the estuary.

17.3 Semi-Aquatic Vegetation

Near the mouth, salt marshes on sandy substrate occur in three areas. Typical species here include *Limonium* species, *Salicornia cf. meyerana* and *Sarcocornia* species. Owing to road protection levees tidal activity has been curtailed on these areas and pioneer terrestrial species such as *Tetragonia decumbens* and *Chrysanthemoides monilifera* are starting to encroach.

Further upstream, salt marshes on more muddy substrates are found. Here the typical species include *Sarcocornia perennis*, *S. decumbens*, *Chenolea diffusa*, *Sueda maritima*, *Limonium scabrum* and *Juncus kraussii*.

Flood plain vegetation above the salt marshes has been heavily grazed and degraded (outside the reserve). Species occurring here include *Sarcocornia pillansia* and *Chrysanthemoides incana*.

Patches of reeds (*Phragmites australis*) occur at places along the riverbanks.

17.4 Terrestrial Vegetation

Vegetation on artificially stabilized areas:

Exposed sand dunes on either side of the estuary mouth have been artificially vegetated. Species used for this operation include the exotic grass *Ammophila arenaria* (Marram grass), which disappears after the pioneer stage has been succeeded, and the indigenous species listed below:

Wasbessie	<i>Myrica cordifolia</i>
Bitou	<i>Chrysanthemoides monilifera</i>
Blombos	<i>Metalasia muricata</i>
Gonna	<i>Passerina</i> spp.
Slangbos	<i>Stoebe</i> spp.
Keur	<i>Sutherlandia frutescens</i>
Pypgras	<i>Ehrharta villosa</i>
Suurvy	<i>Carpobrotus acinaeifermis</i>
Hotnotsvy	<i>Carpobrotus edulis</i>
Seekoring	<i>Agropyron distichum</i>
Bitterbos	<i>Chironia baccifera</i>
Skilpadbos	<i>Mundia spinosa</i>
Seepampoen	<i>Arctotheca niveum</i>
Seegousblom	<i>Didelta carnososa</i>
Tolbos	<i>Leucadendron</i> spp.
Daisy	<i>Senecio</i> spp.
Taaibos	<i>Rhus</i> spp.

The following species occur on vegetated dunes:

Tall shrubs like *Colpoon compressum*, *Euclea racemosa*, *Pterocelastrus tricuspidatus* and *Sideroxylon inerme* occur, while restioids and herbs such as *Restio eleocharis*, *Thamnochortus paniculatus* and *Ficinia lateralis* are common. Riparian species such as *Lycium ferocissimum*, *Zygophyllum morysana*, *Salvia aurea* and *Rhus lucida* can be found at places along the river.

18. NOTEWORTHY FAUNA

18.1 Aquatic invertebrates

The Heuningnes estuary has a tidal influence for 12 km upstream and the mouth has been kept open artificially since 1976. This has resulted in a strong marine influence on the aquatic fauna of the estuary.

As this is the southernmost estuary in Africa it is important for the documentation of southernmost extremities in the distribution of estuarine species. Examples of these are the Ginger Mud Prawn (*Penaeus japonicus*)

the Giant Mud Crab (*Scylla serrata*) both tropical crustaceans, and a tropical gastropod *Nerita albicilla*.

18.2 Fish

The presence of marine species such as baardman (*Umbrina canariensis*), galjoen (*Coracinus capensis*), zebra (*Diplodus cervinus*) and strepies (*Sarpa salpa*) not often found in estuaries illustrate the marine influence on the estuary.

The occurrence of the sea horse (*Hippocampus* sp.) is also noteworthy.

18.3 Birds

The site is of extreme importance to the Damara Tern (*Sterna balaenarum*), probably South Africa's rarest coastal bird. This species is listed by Brooke (1984) as Rare.

The tern nests on the interdune pebble slacks along the coast on either side of the estuary, both within and outside the Reserve. The estuary is used for foraging and for pair formation prior to breeding. Counts indicate that in excess of 30 individuals of this species utilise the estuary and that between 5 and 7 pair's nest in the surrounding coastal dunes. This represents about 15 % of the national population of this species and flock sizes seen at the estuary are amongst the largest seen in southern Africa, (Cooper pers. comm.).

Other bird species that regularly nest in the dunes within the site includes ± 300 pairs of Kelp gulls (*Larus dominicanus*) and several pairs of Caspian Terns (*Hydroprogne caspia*). Other breeding species include the African Black Oystercatcher (*Haematopus moquini*), the Blue crane (*Anthropoides paradisea*), the Spotted Prinia (*Prinia maculosa*), the Kittlitz Sandplover (*Charadrius pecuarius*) and the Egyptian Goose (*Alopochen aegyptiacus*) (Bickerton, 1981) (Underhill, 1984). The Pied Kingfisher (*Ceryle rudis*) also nests in the area.

19. SOCIAL AND CULTURAL VALUES

20. LAND TENURE

The site is registered as state land and has been declared as a State Forest. The site is surrounded on three sides by private land and on the fourth (east) side by the Indian Ocean.

21. LAND USE

(a) Ramsar site

The ownership of the Ramsar site belongs to the State. The site is currently managed by Cape Nature Conservation. Human activities within the site include management activities of the site, and low impact recreation e.g. hiking and fishing.

(b) Surroundings and catchment

To the immediate NE and SW of the reserve undeveloped coastal dunes occur, areas very suitable for inclusion into the reserve as aquatic birds breed in these areas. Beyond these areas are the coastal towns of Struisbaai and Waenhuiskrans. During school holidays these towns attract a large number of holidaymakers. A number of these visitors travel along the beach looking for fishing spots and may end up in the Ramsar site. There are also a few visitors that take long walks along the beach and may enter the reserve.

Inland of the reserve, farming is the common form of land use, which is restricted to a rotational system of grain farming and pastures, while the flood plains are utilized for livestock grazing.

22. FACTORS ADVERSELY AFFECTING THE SITE'S ECOLOGICAL CHARACTER INCLUDING CHANGES IN LAND USE AND DEVELOPMENT PROJECTS

1. Oil pollution from oil spilling at sea.
2. Pollution of the system arising from agricultural activities in the wetlands catchment area. Pesticides and artificial nutrients are already widely used by the agricultural sector in the area.
3. Recreational and coastal development pressures are increasing on all South African coastal areas.
4. Further road culverts or bridges and dams would adversely affect the flow of the tributaries.
5. The use of two, three and four wheeled off-road vehicles is an increasing problem on the beach and coastal dunes. This is the most severe threat to the security of the nesting Damara Terns at present.

23. CONSERVATION MEASURES TAKEN

The area is State land and has been proclaimed as State Forest. An outdated management plan exists for the area. The management authorities have realised this shortcoming and are currently in the process of revising the existing management plan. Conservation measures that have been undertaken and are still being implemented include:

1. The maintenance of a viable ecosystem in the estuary and the prevention of the flooding of developed agricultural and grazing lands by keeping the estuary mouth open.
2. The conservation of the indigenous fauna and flora of the reserve.
3. Control of public access to the reserve for recreation and fishing is by means of a permit system. Control of access to the area below the high water mark along the coast does, at present, rest with the Overberg Regional Services Council.
4. Monitoring of bird breeding colonies.

24. CONSERVATION MEASURES PROPOSED

The revision of the management plan is the most urgent conservation measure that requires attention. The management authorities are aware of this and are currently busy attending to the matter. Further proposed conservation measures will surface during the process of revising the management plan.

25. SCIENTIFIC RESEARCH FACILITIES

N/A

26. CONSERVATION EDUCATION

Not as yet.

27. RECREATION AND TOURISM

N/A

28. JURISDICTION

Cape Nature Conservation (Provincial Conservation Authorities)

29. MANAGEMENT AUTHORITY

Cape Nature Conservation
P/Bag X16
BREDASDORP
7280

30. REFERENCES

1. ACOCKS, J.P.H. 1953. Veld types of South Africa. Memoirs of the Botanical Survey of South Africa, 28 : 1-192. Government Printers, Pretoria.
2. BARNARD, K.H. 1943. Revision of the indigenous fishes of the Southwestern Cape Region. Ann. S. Afr. Mus. 36(2) : 101-262.
3. BARHAM, W.T. 1979. Spawning of *Arenicola lovini* Kinberg in the Heuningnes River Estuary, Bredasdorp. S. Afr. J. Science 75(6) : 262-264.
4. BICKERTON, I.B. 1984. Estuaries of the Cape, Part II: Synopses of available information on individual systems. Report No 25: Heuningnes (C S W 19). Heydorn, A.E.F. and J.R. Grindley (Eds.). CSIR Research Report 424, 64 pp.
5. BRANCH, W.R. 1988. South African Red Data Book - Reptiles and Amphibians. Pretoria. S. Afr. Nat. Sci. Programmes Rep. No. 151. 241pp.
6. BROOKE, R.K. 1984. South African Red Data Book - Birds. S. Afr. Nat. Sci. Prog. Rep. No. 97. 213pp.
7. BURGER, A.E., Cooper, J. and R.W. Furness, 1980. Conservation of the Damara Tern *Sterna balaenarum* at the De Mond Nature Reserve. Cape Town, Percy Fitzpatrick Institute of African Ornithology. 55 pp.
8. COOPER, J. 1982. The Breeding Distribution and Conservation of the Damara Tern in Southern Africa. 1st Progress Report. Cape Town, Percy Fitzpatrick Institute of African Ornithology. 8 pp.
9. COOPER, J. 1983. The Breeding Distribution and Conservation of the Damara Tern in Southern Africa. 2nd Progress Report. Cape Town, Percy Fitzpatrick Institute of African Ornithology. 4pp.
10. DAY, J.H. 1981. Estuarine ecology with particular reference to Southern Africa. Cape Town, AA Balkema., 411pp.
11. DEVIN, D. 1984. Hydrological/hydraulic study of Cape Estuaries, Heuningnes Estuary. Stellenbosch. NRIO Data Report D8401. 29 pp.
12. DIRECTORATE OF FORESTRY, 1980. Beleidsmemorandum - De Mond-staatsbos. Dir. of Forestry (unpublished) 15 pp + appendices.
13. DIRECTORATE OF FORESTRY. Internal File A20/2/3/107. Nature Reserve - De Mond.
14. FITZSIMMONS, V.F.M. 1962. The Snakes of Southern Africa. Cape Town Purnell. 423 pp.
15. GOHL, C.R. 1944. Drift sand reclamation and coast stabilisation in the southwestern districts of the Cape Province. S. Afr. Forestry Assoc. Inl. No

1:4-18.

16. GREIG, J.C. and BURDETT, P.D. 1976. Patterns in the distribution of southern African terrestrial tortoises (Cryptodira: *Testudinidae*) *Zoologica Africana*. 11: 249-273
17. HEYDORN, A.E.F. and TINLEY, K.L. 1980. Estuaries of the Cape, Part I. Synopsis of the Cape coast. Natural features, dynamics and utilisation. Stellenbosch. CSIR Research Report 380. 97pp.
18. KRIGE, J.G.J. 1973. Bredasdorp: a regional landuse study. M.Sc. Thesis. Dept. Urban and Regional Planning, Univ. of Cape Town. 91pp.
19. MACLEAN, G.L. 1993. Roberts birds of South Africa. 6th edition. The Trustees of the John Voelcker Bird Book Fund, Cape Town. 871pp.
20. MEHL, J.A.P. 1973. Ecology, osmoregulation and Reproductive biology of the White Steenbras, *Lithognathus lithognathus* (Teleostei : *Sparidae*) *Zoologica Africana* 8(2) : 157-230.
21. MOLL, E.J., CAMBELL, B.M., COWLING, R.M., BOSSI, L., JARMAN, M.L. and C BOUCHER. 1984. A description of major vegetation categories in and adjacent to the Fynbos Biom. S.A. Nat. Sc. Prog. Rep. No 83. 30pp.
22. POYNTON, J.C. 1964. The Amphibia of Southern Africa: a faunal study. *Ann. Natal Mus.* 17: 1-334.
23. REYNEKE, P.G. M Sc Thesis (in progress).
24. SMITHERS, R.H.N. 1986. South African Red Data Book - Terrestrial Mammals. S. Afr. Nat. Sci. Programmes Rep. 125. 216pp.
25. UNDERHILL, G.D. 1984. Report on visit to De Mond Forest Reserve - 3 Jan. 1984 on Internal File A20/2/3/107. Directorate of Forestry, Cape Town.
26. UNDERHILL, L.G. and COOPER, J. 1983. Counts on waterbirds at coastal wetlands in Southern Africa Estuaries 1979-1981. Interim version UNWETLD. Unpublished. Western Cape Wader Study Group and Percy Fitzpatrick Institute of African Ornithology.
27. WALSH, B.N. 1968. Some notes on the incidence and control of driftsands along the Caledon, Bredasdorp and Riversdale coastline of South Africa. Pretoria. Dept. of Forestry. Bulletin No 44. 79pp.