

# **NDUMO GAME RESERVE**

## **SOUTH AFRICA**

Information sheet for the site designated to the

### **List of Wetlands of International Importance**

in terms of the

### **Convention on Wetlands of International Importance especially as Waterfowl Habitat**

South African Wetlands Conservation Programme

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Department of Environmental Affairs and Tourism

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**INFORMATION SHEET**

1. **COUNTRY**

South Africa

2. **DATE OF COMPILATION**

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3. **REFERENCE NUMBER**

Not yet available

4. **COMPILER**

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5. **NAME OF WETLAND**

Ndumo Game Reserve

6. **DATE OF RAMSAR DESIGNATION**

Not yet available

7. **GEOGRAPHICAL CO-ORDINATES**

26°53' south and 32°16' east

8. **GENERAL LOCATION**

The reserve is situated in the north western corner of Kwazulu-Natal, approximately 500 km, north, north-east of Durban.

9. **AREA**

10 117 ha

10. **WETLAND TYPE**

Five wetland types which are either permanent, seasonal or intermittent occur in the area. These include:

Permanent and intermittent rivers/streams/creeks;

Permanent and intermittent freshwater lakes;

Permanent, seasonal and intermittent saline/brackish lakes or marshes;

Permanent, seasonal and intermittent freshwater marshes and/or pools; and

Tree-dominated wetlands - riparian/gallery forest

11. **ALTITUDE**

Minimum: approximately 18 m above sea level

Maximum: approximately 170 m above sea level (reserve high point)

Mean: approximately 30 m above sea level

12. **OVERVIEW OF SITE**

Ndumo Game Reserve is situated at the junction of the Usuthu and Pongolo floodplain systems. The Pongolo River runs through the reserve (from north to south) in the east while the Usuthu river forms the northern border of the reserve and the international border with Mozambique. There are two major semi-permanent floodplain pans and many smaller ephemeral pans within the reserve.

## 13. **PHYSICAL FEATURES**

### **Geology and Geomorphology**

Most of the reserve is relatively low lying flat land, much of which is regularly inundated when the Usuthu and Pongolo Rivers flood. Geologically, the area comprises cretaceous beds overlain with alluvium and tertiary sediments, all of which are exposed in several areas. Lebombo rhyolite outcrops occur, principally in the western areas.

### **Origins**

During the Pleistocene, sandy material which forms the Port Durnford beds was deposited over the nearly flat surface of Miocene rocks. This was followed by general lowering of sea levels causing the coastline to shift progressively to the east. Where the shoreline was located for any length of time through the sea level through the sea level being static, a system of longshore dunes developed. It is these dunes with their typical north-south orientation, subsequently much modified by wind action to produce the sands of recent ages, which characterise the landscape of the Maputaland plain. The sea level change also affected flow velocities of the rivers of the area causing them to deposit alluvial material at successively different levels. The alluvium now forms river terraces whilst the infilling forms the present day Pongolo floodplain.

### **Hydrology**

There are three principal water sources to the reserve, namely the Pongolo and Usuthu Rivers and the streams in the south west. The flow in the Pongolo River in the south is regulated by a large dam 90 km upstream, while the Usuthu River is modified by irrigation abstraction in Swaziland. Some of the streams entering from the southwest tend to be saline at reduced flow rates. Eutrophication resulting from agriculture may also become a problem in these streams.

The largest pan in terms of surface area, the Banzi pan, is currently artificially kept at high levels by means of a barrage (causeway). This was deemed necessary as severe scouring of the natural exit during a cyclone in 1983 eroded it and drained the pan. The second largest pan exhibits high salinities at times when the water level is low. It also has an artificial barrage at its downstream end.

### **Soil type and chemistry**

The Ndumo hill is composed of red sands while east of it, the sandveld (situated mostly 30 m above sea level) is composed of undulating pallid sands. Lower down the slope, there is grey

compacted coarse sandy clay with a hard mottled layer at one metre depth. These two sandveld areas comprise about 1151 ha. The flats, comprising 6316 ha, consist of reddish sandy clay as does the western area (648 ha) of the reserve.

### **Water Quality**

Marine cretaceous deposits underlie the Pongolo floodplain and the groundwater is saline. Lakes which receive seepage can therefore become quite saline ( $<500$  to  $5000 \mu\text{S cm}^{-1}$ ) during the dry winter season but summer floods flush them out and replenish them with low conductivity, turbid water (Heeg, Breen, Colvin, Furness and Musil 1978). The waters of the Pongolo system have recently had a reduced silt burden since the construction of the Jozini Dam upstream. The Ingwavuma River, however, enters the Pongolo River just outside the reserve and if it is in flood then there can still be a considerable silt load for short periods in the Pongolo River. The Usuthu River is affected markedly by agriculture upstream, resulting in reduced flows for most of the year. There are still occasional floods and in these instances the silt load is high.

Nyamithi pan is fed principally by streams entering it from the south west. Intensive agriculture in the catchment has recently resulted in heavy silt loads following good rains. Eutrophication may soon result from the increased use of fertilizers in the Balamhlanga catchment. High salinities also occur in these streams at low flow rates due to salts leaching from the substrates.

### **Depth, fluctuations and permanence**

Water areas in the "wet season" cover approximately 4047 ha (40% of the reserve) while in the "dry season" this shrinks to about 1518 ha (about 15%). The pans are all relatively shallow and siltation is a serious threat to them. In the early 1980's, Cyclone Domoina caused considerable siltation of Nyamithi pan while eroding a new outlet to Banzi pan.

Surveys are currently under way to assess the rate of siltation of the principal pans by means of bathymetrical studies and taking cores. This is being carried out by the Council for Scientific and Industrial Research's (C.S.I.R.'s) Water Technology Section of Environmentek.

### **Tidal variations**

Not applicable.

### **Catchment area**

Apart from the catchments of the two main rivers, the only other significant catchment of the reserve is to the south west, in communally owned areas where increasing agriculture is a threat. The total area is 11 714 km<sup>2</sup>.

### **Downstream area**

The downstream areas are in Mozambique and constitute a continuation of the Usuthu floodplain system into the Maputo River floodplain.

### **Climate**

Little detailed information on the weather of Ndumo is available. The average annual rainfall has been given as 638 mm. The heaviest rains usually fall in middle to late summer with lighter falls in early summer. Summer temperatures often reach well above 40° Celsius.

## 14. **ECOLOGICAL FEATURES**

Six major vegetation types occur in the reserve. The two related to the wetlands are:

### **Riverine and floodplain vegetation**

Fairly large tracts of riverine and floodplain vegetation occur along the two principal rivers and the main pans. The floodplain grass *Cynodon dactylon* dominates on the ephemeral mudflats while trees such as *Ficus sycomorus* and *Trichilia emetica* dominate in the riparian forest areas. Six plant communities have been recognised on the floodplain and are grouped according to their relative periods of exposure and inundation (Breen, Heeg and Seaman 1993). These are:

- the *Acacia xanthophloea* - *Dyschoriste depressa* community which occurs near the outer edge of the floodplain under drier conditions;
- the *Ficus sycomorus* - *Rauvolfia caffra* forest community which grows along the levees of the Pongolo and Usuthu rivers;
- the *Cynodon dactylon* community which occurs in areas which are alternately regularly inundated and exposed, and is especially well developed around shallow pans subjected to periodic flooding;
- the *Cyperus fastigiatus* - *Echinochloa pyramidalis* community which occurs in marshy areas and tolerates longer periods of inundation;
- two *Phragmites* communities, each of which comprise distinct species. Both these communities occur in the wettest areas with *Phragmites australis* having a preference for flat, swampy areas, and *P. mauritanus* favouring river banks, inlet/outlet channels and pan margins where there is a fluctuation in water level; and

the euhydrophyte communities which may either be permanent or seasonal. These occur within the zone of colonization of open waters. Permanent communities consist mainly of *Trapa bispinosa* and various *Nymphaea* species. They are best developed in those pans where the water level is not subject to extensive seasonal fluctuations. The seasonal communities consist mainly of *Potamogeton crispus* and *Naja pectinata* and normally occur where a reasonable depth of water is still retained in the dry season. The turions of *P. crispus* are extremely sensitive to desiccation and large plant standing crops develop where the pans do not dry out. Large turions are selectively grazed by waterfowl which stimulates production of small turions which are less easily grazed. The result is a stable grazing system (Rogers 1984, Rogers and Breen 1990a,b).

#### **Drainage line communities**

These occur along the seasonal streams, particularly in the south and west. Principal tree species in these communities include *Acacia robusta*, *Schotia brachypetala* and *Spirostachys africana*.

Other important ecological features are the ephemeral small pans in the south west, the principal floodplain pans and the two main permanent rivers. Areas of fever tree *Acacia xanthophloea* forests also occur.

### 15. **LAND TENURE**

The whole area was proclaimed as a Nature Reserve in 1924 and remains so today. The surrounding area is communally owned by the Mathenjwa and Tembe tribes. Most of the floodplain upstream is state land.

#### **Legal status**

The reserve is administered by the Kwazulu-Natal Department of Nature Conservation as a protected area under the jurisdiction of the provincial Kwazulu-Natal government.

### 16. **CONSERVATION MEASURES TAKEN**

The Natal Parks Board (N.P.B.) managed the reserve until recently, after which it was handed over to the Kwazulu Department of Natural Resources to manage. This department adapted the N.P.B. management plan.

#### **Management plan**

Currently moves are afoot to join the Ndumo Game Reserve and the Tembe Elephant Park to the east. A joint management plan is being drawn up and should be available in the near future.

17. **CONSERVATION MEASURES PROPOSED BUT NOT YET IMPLEMENTED**

There is a proposal to secure the Balamhlanga catchment of the Nyamithi pan (second largest) as this area is under threat from organised agriculture. This has been discussed in many quarters but currently local problems have led to its shelving, temporarily at least. As was mentioned under 16 above, there is a proposal to join the Ndumo Game Reserve and the Tembe Elephant Park. The Kwazulu-Natal government has stated that it would like to join the two reserves by including the land between them. Strategies and logistics are currently being investigated.

Recently the local community of the Mathenjwa people have been approached by the Kwazulu Department of Natural Resources with a view to establishing some form of Nature Reserve upstream of Ndumo in the Usuthu gorge, on the South African side of the border. This is to be allied with a community led tourism initiative. Negotiations have just begun but could well lead to a proclamation, in some form.

There have been discussions with the Mozambican authorities about "mirror parks" in Mozambique opposite Ndumo and the other reserves. Since peace was declared after the recent civil war in Mozambique, there have been increasing demands for agricultural, forestry and tourism concessions in the area.

18. **LAND USE**

a. Ramsar site:

The site itself is a Nature Reserve with low density tourism. Tourists drive around the reserve on a series of hardened roads, principally in the dry, western areas. Guided walks in several areas are offered. Ndumo Game Reserve is well known for its abundant bird life and diversity of species while game viewing for larger game species can be very successful.

b. Surroundings and catchment:

Outside the reserve, subsistence agriculture dominates in the drier areas while small scale commercial agriculture takes over in wetter areas. A large agricultural irrigation scheme is operating erratically south of the reserve in the catchment area.



## **Resource utilization**

### a. Consumptive utilization

Local residents are allowed to harvest reeds and sedges on a controlled, sustainable basis and a scheme to allow fish utilisation on a limited scale is under way. Local people gain access to the reserve through three gates in the east to collect water from the Pongolo River. Meat from the annual culls is sold to the local community. These activities improved the relationship with the local communities.

### b. Non-consumptive utilization

Tourism

## 19. **POSSIBLE CHANGES IN LAND USE AND PROPOSED DEVELOPMENT PROJECTS**

No major changes in land use are currently anticipated but agriculture, grazing and other land uses will, in all likelihood, become more intensive in the area immediately surrounding the reserve. This will probably result in an increase in erosion, siltation and eutrophication.

## 20. **DISTURBANCES AND THREATS**

The reserve is situated on the international border between South Africa and Mozambique. Refugees often cross the border illegally. The previous civil war in Mozambique meant that firearms were readily available in the region. As a result, poaching of larger mammals was a problem. In recent years however, since peace returned to Mozambique, the poaching has decreased considerably. Animals such as black and white rhinoceros which have a fairly high density in the reserve are however constantly under threat from poachers. In addition, afforestation plans by a large commercial forestry company may be a threat to the integrity of the floodplain system on the Mozambique side of the border.

This section of northern Kwazulu-Natal is not without other problems too, particularly with regard to the somewhat antagonistic relations between the local communities adjacent to the reserve and the reserve itself. This is largely as a result of the local people having been removed from this area when the reserve was proclaimed. The reserve is surrounded by poor rural communities in high densities. Land claims and water abstraction by local populations is therefore a possible threat.

Agriculture in the catchment to the south and west of the reserve is leading to sedimentation and infilling of pans such as Nyamithi. Eutrophication and increases in salinity may also

increase as a result of intensified agriculture. Noxious weeds and invasive aliens including *Lantana camera* and *Sisal* sp are a serious threat to the vegetation over extensive areas of the floodplains. The exotic invasive water hyacinth, *Eichornia crassipes* occurs in the rivers and, although regularly controlled, enters the reserve in large quantities during floods.

21. **HYDROLOGICAL AND BIOPHYSICAL VALUES**

The site forms the lower reaches of the Pongolo floodplain, the second largest floodplain system in South Africa. The hydrological value of the site therefore should be viewed in the context of the entire wetland system. Breen *et al* (1978) ire wetland system. The hydrological value of the site to South Africa hydrologically as. It has, however, great value with regard to fish in that during flooding the principal movements of fish are upstream. Ndumo provides a safe sanctuary and reservoir for floodplain fish as they are under heavy exploitation both upstream and downstream. Annual yields of fish to the fishermen upstream of the reserve have been estimated at up to 500 000 kg per year.

22. **SOCIAL AND CULTURAL VALUES**

Local people were removed from this area when the reserve was proclaimed. The section of the wetland upstream of the reserve on the Pongolo floodplain however, is extensively utilised by people living in the vicinity. Subsistence agriculture and large-scale fishing are important functions which the wetland supports. This is of considerable value both socially and culturally and provides a basis for the local rural economy.

23. **NOTEWORTHY FAUNA**

Large and relatively safe breeding populations of crocodile, hippo, nyala and others are present (Appendix 2). About 2% of the world's black rhino occur here. Ndumo Game Reserve is the home for the following red data large herbivores: red duiker (rare), hippopotamus (rare), black rhino (vulnerable) and suni (vulnerable). Please refer to appendix 2 for a list of the larger mammals present, plus the latest information on their abundances. The only of these which is a wetland dependent species is the hippopotamus.

The wetlands of Ndumo Game Reserve support a variety of birdlife which utilise the site either as a breeding or feeding habitat or both. Ducks and pelicans feed on the pans during winter and spring. A total of 305 bird species have been recorded on the Pongolo floodplain and in the surrounding area. Of these, 120 species are associated with or dependent on the floodplain in one way or another (Appendix 3). Of all the species recorded, 35 are included in the South African Red Data Book (Brooke 1984). Of the 120 wetland associated species recorded, the following nineteen are Red Data waterbirds: White pelican (rare), Pinkbacked

pelican (rare), Rufous-bellied heron (rare), Whitebacked night heron (indeterminate), Little bittern (rare), White stork (rare), Black stork (indeterminate), Woollynecked stork (rare), Openbill stork (rare), Saddlebilled stork (rare), Yellowbill stork (rare), Greater flamingo (indeterminate), Lesser flamingo (indeterminate), Pygmy goose (rare), African finfoot (indeterminate) Lesser jacana (rare), Whitecrowned plover (rare), Redwinged pratincole (rare) and Caspian tern (rare). White pelicans from the breeding colony at Lake St. Lucia are known to feed on the floodplain from time to time, and in the breeding season carry from the floodplain to their young over a distance of 100 km away (Heeg and Breen 1982). This suggests that the pans on the Pongolo floodplain are important for the maintenance of this, the only breeding colony of White pelicans in South Africa (Heeg and Breen 1982).

The extensive *Phragmites australis* stands in the Ndumo Game Reserve is one of two or possibly three breeding localities of the openbilled stork in South Africa. This species is dependent on the floodplain for both feeding and breeding, since its diet is restricted to large molluscs (mussels and large snails) which need to occur in sufficient abundance and in shallow water for the birds to be able to obtain sufficient food.

Waterfowl are well represented by a wide variety of species as well as an abundance in numbers. Whitefaced duck for example, occur in large flocks during the peak of the *Potamogeton crispus* growing season. As many as 8000 of these duck may be present on an individual pan where they feed exclusively on the turions of *P. crispus* (Breen and Heeg 1982). The large flocks which temporarily invade the floodplain are indicative of its importance as a winter feeding ground. The reserve also provides a relatively safe haven for migrating waterbirds as it sits astride an important north/south migration route.

Two red data fish species, the Mozambique killifish *Nothobranchius orthonotus* and the Checked goby *Redigobius dewaali*, also occur in the reserve.

Ten red data reptiles occur in the reserve. These are as follows: Natal hinged tortoise *Kninxys natalensis*, African rock python *Python sebae*, Eastern wolf snake *Lycophidion semiannule*, Variegated wolf snake *Lycophidion variegatum*, Whyte's water snake *Lycodonorphus whytii obscuventris*, Forest marsh snake *Natriciteres variegata sylvatica*, Mozambique shovel-snout *Prosymna janni*, East African egg eater *Dasypeltis medici*, Forest cobra *Naja melanoleuca* and the Nile crocodile *Crocodylus niloticus*. Of these the African rock python, Whyte's water snake, Forest marsh snake and the Nile crocodile are wetland dependent species.

#### 24. **NOTEWORTHY FLORA**

The *Cynodon dactylon* community which occurs in areas which are alternately regularly

inundated and exposed, is of major significance to the productivity of the floodplain pans (Heeg and Breen 1982). With abundant water, such as immediately following exposure, production is high (23 kg ha<sup>-1</sup> d<sup>-1</sup> dry mass) and the lawns support many terrestrial grazers. Once the lawns inundated again, that which was not grazed by terrestrial grazers during exposure is either utilised directly by aquatic herbivores or enters the decomposer cycle as detritus. The major contribution by hydrophytes to the productivity of the floodplain pans comes from the seasonal winter growth of *Potamogeton crispus* which provides an input at a time when that from all other sources is at a minimum. The turions of *P. crispus* are extremely sensitive to desiccation and large plant standing crops develop where the pans do not dry out. Large turions are selectively grazed by waterfowl which flock in large numbers onto the pans during the winter months to feed.

25. **CURRENT SCIENTIFIC RESEARCH AND FACILITIES**

A small weather station was maintained on behalf of the weather office at the main camp (its presence is under review). Basic parameters such as rainfall and maximum and minimum temperatures were recorded.

26. **CURRENT CONSERVATION EDUCATION**

There are no special education facilities available at present. A comprehensive education centre is currently being planned for the periphery of the reserve in order to serve the needs of the adjacent community. Schoolchildren and eminent local people are regularly taken on tours though the reserve.

27. **RECREATION AND TOURISM**

Day visitors arrive in small numbers. Seven three bedded tourist facilities are available to the public and occupancy rates are reaching 90%. A new trail camp is envisaged and the plan is for it to be run by the private sector. A campsite, just outside the reserve, has received funding and will be a joint venture with the local community.

28. **MANAGEMENT AUTHORITY**

The reserve is administered and managed by the Kwazulu Department of Natural Resources, which falls under the Kwazulu-Natal provincial government.

29. **JURISDICTION**

The reserve is protected under the Kwazulu-Natal Nature Conservation Act and its regulations. The Kwazulu-Natal Department of Nature Conservation is responsible for its implementation.

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31. **REASONS FOR INCLUSION IN THE LIST OF WETLANDS OF INTERNATIONAL IMPORTANCE**

**Criteria for representative or unique wetlands**

Criterion 1 (a). A particularly good representative example of a natural or near-natural wetland characteristic of the appropriate biogeographical region.

Motivation: Most of the reserve is an excellent example of a floodplain ecosystem type characteristic of the north-eastern part of Kwazulu-Natal and southern Mozambique. It is relatively unaffected by the influence of people, unlike the rest of the floodplain outside the reserve.

Criterion 1 (c). A particularly good representative example of a wetland which plays a substantial hydrological, biological or ecological role in the natural functioning of a major river basin or coastal system especially where it is located in a trans-border position.

Motivation: The reserve is located on the border of Mozambique - possibility of extending into Mozambique to form a transborder park, and plays an important role as it is at the confluence of two major rivers. It contains much of the floodplain of the Usuthu River as well as the important downstream end of the Pongolo River floodplain.

**General criteria based on plants and animals**

Criterion 2 (a). Supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species.

Motivation: The following seven red data waterbirds have been recorded in the area: White Pelican (rare), Openbill stork (rare), Yellowbill stork (rare), Greater flamingo (indeterminate), Lesser flamingo (indeterminate), Pygmy goose (rare) and Lesser jacana (rare). Ndumo Game Reserve is also the home for the following red data large herbivore: hippopotamus (rare). Two red data fish species and ten red data reptiles also occur here.

Criterion 2 (c). It is of special value as the habitat of plants or animals at a critical stage of

their biological cycles.

Motivation: The reserve acts an important refuge for breeding stocks of fish which recolonise the floodplain by migrating upstream during flooding events. Therefore the stock for the entire floodplain is protected within the reserve. The reserve also provides an important stopover and breeding and feeding site for thousands of migrating waterbirds along the north/south migration route in the eastern part of southern Africa.

#### **Specific criteria for using waterfowl**

Criterion 3 (b). It regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity.

Motivation: Waterfowl are well represented in the reserve by a wide variety of species as well as an abundance in numbers. The reserve provides a relatively safe haven for thousands of migrating waterfowl as it sits astride an important north/south migration route.

### **32. OUTLINE MAP OF SITE**

**APPENDIX 1**

**POPULATION AND BIOMASS SUMMARY FOR LARGE HERBIVORES IN NDUMO  
GAME RESERVE, AUGUST 1992.**

Species	Method	Estimation Population	Mass (kg)	Biomass (kg)	LAU Total
Buffalo	2	60	450	27 000	60.0
Bushbuck	5,6	100	30	3 000	13.1
Bushpig	5,6	350	54	18 900	87.5
Duiker, Grey	1	477	15	7 155	39.8
Duiker, Red	1	605	10	6 050	50.4
Giraffe	5,4,6	35	750	26 250	51.5
Hippo	2	374	1000	374 000	680.0
Impala	1	441	40	17 640	71.8
Kudu	5,6	100	136	13 600	40.8
Nyala	1	6 877	60	412 620	1758.8
Reedbuck	5,6	300	50	15 000	48.9
Rhino, Black	3,5	35	816	28 560	54.7
Rhino, White	3,5	50	1500	75 000	122.0
Suni	5	200	5	1 000	11.1
Warthog	5,6	40	45	1 800	7.1
Waterbuck	5,6	15	160	2 400	6.9
Zebra	5,6	100	200	20 000	54.4
		TOTAL		1 049 975	3158.7

The wetland associated and/or dependent species are highlighted

**Estimation Method:**



78	Little bittern	R				4						10			1
81	Hamerkop		1	2	3	4	5	6	7	8		10	11	12	1
83	White Stork	R	1	2	3	4								12	1
84	Black Stork	I				4							11	12	1
86	Woollynecked stork	R	1	2	3	4	5	6	7	8		10	11	12	1
87	Openbill Stork	R	1	2	3	4	5	6	7			10	11	12	1
88	Saddlebilled stork	R	1	2	3	4	5	6	7	8		10	11	12	1
89	Marabou Stork	R			3					8			11	12	1
90	Yellowbilled stork	R	1	2	3	4	5	6	7	8		10	11	12	1
91	Sacred ibis		1	2	3	4	5	6	7	8		10	11	12	1
93	Glossy ibis		1	2	3			6	7	8		10	11	12	1
94	Hadeda ibis		1	2	3	4	5	6	7	8		10	11	12	1
95	African spoonbill		1	2	3	4	5	6	7	8		10	11	12	1
96	Greater flamingo	I													1
97	Lesser flamingo	I													1
99	Whitefaced duck		1	2	3	4	5	6	7	8		10	11	12	1
100	Fulvous duck												11		1
102	Egyptian goose		1	2	3	4	5	6	7	8		10	11	12	1
103	South African shelduck									8					1
104	Yellowbilled duck		1	2	3	4			7	8			11	12	1
107	Hottentot teal		1				5	6	7			10		12	1
108	Redbilled teal			2									11		1
114	Pygmy goose	R	1					6	7	8		10			1
115	Knobbilled duck			2				6	7			10	11		1
116	Spurwinged goose		1	2	3	4	5	6	7	8		10	11	12	1
122	Cape vulture	V	1	2		4									1
123	Whitebacked vulture			2	3	4	5			8					1
125	Whiteheaded vulture	R		2			5	6							1
126	Yellowbilled kite		1	2	3					8		10	11	12	1
127	Blackshouldered kite				3	4							11	12	1

128	Cuckoo hawk	I			3				7				11		1
132	Tawny eagle		1	2	3									12	1
133	Steppe eagle			2										12	1
134	Lesser spotted eagle		1	2											1
135	Wahlberg's eagle		1	2	3	4							11	12	1
136	Booted eagle													12	1
137	African hawk eagle				3										1
139	Longcrested eagle		1	2	3			6		8			11	12	1
140	Martial eagle	V	1	2	3	4		6		8			11	12	1
141	Crowned eagle		1	2	3	4	5	6	7	8		10	11	12	1
142	Brown snake eagle			2	3	4			7	8		10		12	1
143	Blackbreasted eagle		1		3								11		1
144	Southern banded snake eagle	R								8					1
146	Bateleur	V	1	2	3	4	5	6	7	8		10	11	12	3
147	Palmnut vulture	R		2				6	7	8			11		1
148	African fish eagle		1	2	3	4	5	6	7	8		10	11	12	5
149	Steppe buzzard		1	2	3							10	11	12	1
154	Lizard buzzard		1		3	4	5	6	7	8		10	11	12	1
157	Little sparrowhawk			2		4									1
159	Little banded goshawk					4									1
160	African goshawk		1		3	4	5	6	7	8			11	12	6
161	Gabar goshawk					4									1
165	African marsh harrier		1	2	3								11	12	1
169	Gymnogene		1	2	3	4	5	6	7	8		10	11	12	1
170	Osprey		1					6							1
175	Sooty falcon			2	3										1
180	Eastern redfooted kestrel		1	2										12	1
189	Crested francolin		1	2	3	4	5	6	7	8		10	11	12	1
200	Common quail		1							8					1
203	Helmeted guineafowl		1	2	3	4	5	6	7	8		10	11	12	1

204	Crested guineafowl		1	2	3	4	5	6	7	8		10	11	12	1
212	African crane		1												1
213	Black crane		1	2		4	5	6	7			10	11	12	1
223	Purple gallinule								7			10			1
226	Moorhen		1	2		4		6					11	12	1
228	Redknocked coot												11		1
229	African finfoot	I											11		1
237	Redcrested korhaan		1		3									12	1
238	Blackbellied korhaan					4						10	11	12	1
240	African jacana		1	2	3	4	5	6	7	8		10	11	12	1
241	Lesser jacana	R				4	5	6	7						1
242	Painted snipe						5	6	7						1
245	Ringed plover		1			4				8		10	11	12	1
249	Threebanded plover		1	2	3	4	5	6	7	8			11	12	1
255	Crowned plover		1		3	4	5		7	8				12	1
256	Lesser blackwinged plover	R				4	5		7			10	11		1
257	Blackwinged plover								7						1
258	Blacksmith plover		1	2	3	4	5	6	7	8		10	11	12	1
259	Whitecrowned plover	R				4									1
260	Wattled plover		1	2	3	4	5		7	8		10	11	12	1
264	Common sandpiper		1	2	3	4	5		7			10	11	12	1
266	Wood sandpiper		1	2	3	4	5					10	11	12	1
269	Marsh sandpiper		1	2	3		5	6				10	11	12	1
270	Greenshank		1	2	3	4	5	6	7			10	11	12	1
272	Curlew sandpiper		1										11	12	1
274	Little stint		1	2		4							11	12	1
281	Sanderling												11		1
284	Ruff		1	2	3	4						10	11	12	1
286	Ethiopian snipe							6							1
294	Avocet					4	5	6	7			10			1



295	Blackwinged stilt		1	2	3	4	5	6	7	8		10	11	12	1
297	Spotted dikkop				3		5			8			11		1
298	Water dikkop		1	2	3	4	5	6	7			10	11	12	1
304	Redwinged pratincole	R											11		1
322	Caspian tern	R	1			4		6					11	12	1
338	Whiskered tern								7			10	11	12	1
339	Whitewinged tern		1	2	3	4							11		1
349	Rock pigeon					4									1
350	Rameron pigeon									8					1
352	Redeyed dove		1	2	3	4	5	6	7	8		10	11	12	1
354	Cape turtle dove		1	2	3	4	5	6	7	8		10	11	12	1
355	Laughing dove		1	2	3	4				8		10	11	12	1
358	Greenspotted dove		1	2	3	4	5	6	7	8		10	11	12	1
359	Tambourine dove		1			4		6	7	8		10	11	12	1
361	Green pigeon		1	2			5	6	7	8			11	12	1
363	Brownheaded parrot						5							12	1
371	Purple crested lourie		1	2	3	4	5	6	7	8		10	11	12	1
373	Grey lourie					4							11	12	1
374	European cuckoo		1	2	3	4								12	1
375	African cuckoo			2											1
377	Redchested cuckoo		1	2								10	11	12	1
380	Great spotted cuckoo		1											12	1
381	Striped cuckoo		1												1
382	Jacobin cuckoo		1	2	3	4							11	12	1
385	Klaas's cuckoo		1	2						8		10	11	12	1
386	Diederik cuckoo		1	2	3	4							11	12	1
391	Burchell's coucal		1	2	3	4	5	6	7	8		10	11	12	1
392	Barn owl									8					1
393	Grass owl	I				4									1
394	Wood owl		1			4		6					11	12	1

395	Marsh owl				3												1
398	Pearlspotted owl						5										1
401	Spotted eagle owl		1	2	3	4	5	6	7				11	12			1
403	Pel's fishing owl	R								8							1
405	Fierynecked nightjar		1	2	3	4	5	6	7	8		10	11	12			1
409	Mozambique nightjar		1			4							11	12			1
415	Whiterumped swift		1										11	12			1
417	Little swift		1			4							11	12			1
424	Speckled mousebird		1	2	3	4	5	6	7	8		10	11	12			1
426	Redfaced mousebird		1		3	4	5	6		8		10	11	12			1
427	Narina trogon		1	2	3		5	6	7	8		10	11	12			1
428	Pied kingfisher		1	2	3	4	5	6	7	8		10	11	12			1
429	Gaint kingfisher		1	2	3	4	5	6	7	8		10	11	12			1
431	Malachite kingfisher		1	2	3	4	5	6		8		10	11	12			1
432	Pygmy kingfisher					4	5										1
433	Woodland kingfisher		1	2									11	12			1
435	Brownhooded kingfisher		1	2	3	4	5	6	7	8		10	11	12			1
437	Striped kingfisher		1	2	3	4	5			8		10	11	12			1
438	European bee eater		1	2	3	4						10	11	12			1
440	Bluechecked bee eater					4											1
443	Whitefronted bee eater		1		3	4	5		7	8		10		12			1
444	Little bee eater		1	2	3	4	5	6	7	8			11	12			1
446	European roller		1	2	3	4								12			1
447	Lilacbreasted roller		1	2	3	4							11	12			1
449	Purple roller							6									1
450	Broadbilled roller		1	2								10	11	12			1
451	Hoopoe		1	2			5	6	7	8		10	11	12			1
452	Redbilled woodhoopoe		1	2	3	4	5	6	7	8		10	11	12			1
454	Scimitar billed woodhoopoe		1	2	3	4	5	6	7	8		10	11	12			1
455	Trumpeter hornbill		1	2	3	4	5	6	7	8		10	11	12			1

458	Redbilled hornbill				3											1
459	Yellowbilled hornbill		1		3	4				8				12		1
460	Crowned hornbill		1	2	3	4	5	6	7	8		10	11	12		1
463	Ground hornbill	V		2			5									1
464	Blackcollared barbet		1	2		4	5	6	7	8		10	11			1
466	White-eared barbet		1	2		4	5		7	8			11			1
469	Whitefronted tinker barbet		1	2	3	4	5	6	7	8		10	11	12		1
471	Goldenrumped tinker barbet		1		3	4				8		10	11			1
474	Greater honeyguide				3	4		6		8		10	11	12		1
475	Scalythroated honeyguide		1		3		5		7	8		10	11	12		1
483	Goldentailed woodpecker		1	2	3	4	5	6	7	8		10	11	12		1
486	Cardinal woodpecker		1	2	3	4	5	6	7				11	12		1
487	Bearded woodpecker					4	5			8		10				1
490	African broadbill	V						6		8		10	11	12		1
496	Flappet lark		1	2	3	4								12		1
498	Sabota lark												11	12		1
518	European swallow		1	2	3	4							11	12		1
520	Whitefronted swallow													12		1
522	Wiretailed swallow					4										1
527	Lesser striped swallow		1	2	3	4			7	8		10	11	12		1
536	Black sawwing swallow		1		3	4	5	6	7				11	12		1
538	Black cuckooshrike											10	11			1
541	Forktailed drongo		1	2	3	4	5	6	7	8		10	11	12		1
542	Sqauretailed drongo		1	2	3	4	5	6	7	8		10	11	12		1
543	European golden oriole		1	2	3	4			7					12		1
545	Blackheaded oriole		1				5	6	7	8		10	11			1
548	Pied crow		1	2	3	4	5	6	7	8		10	11	12		1
554	Southern black tit		1	2	3	4	5	6	7	8		10	11	12		1
558	Grey penduline tit				3	4			7							1
560	Grey penduline tit				3	4			7							1

568	Blackeyed bulbul		1	2	3	4	5	6	7	8		10	11	12	1
569	Terrestrial bulbul		1		3	4	5	6	7	8		10	11	12	1
572	Sombre bulbul		1	2	3	4	5	6	7	8		10	11	12	1
574	Yellowbellied bulbul		1	2	3	4	5	6		8			11	12	1
575	Yellowspotted nicator		1	2	3	4	5	6	7	8		10	11	12	1
576	Kurrichane thrush		1	2	3	4	5	6	7	8		10	11	12	1
596	Stone chat					4	5	6	7	8			11		1
599	Heuglin's robin		1	2	3	4							11	12	1
600	Natal robin		1		3	4	5	6	7	8			11	12	1
601	Cape robin												11		1
602	Whitethroated robin		1			4	5	6	7	8			11	12	1
613	Whitebrowed robin		1	2	3	4	5	6	7	8		10	11	12	1
616	Brown robin									8					1
617	Bearded robin			2					7	8		10	11	12	1
635	Cape reed warbler			2											1
638	African sedge warbler		1	2		4							11	12	1
643	Willow warbler		1		3	4									1
648	Yellowbreasted apalis		1	2	3	4	5	6	7	8		10	11	12	1
649	Rudd's apalis					4									1
651	Longbilled crombec		1	2	3	4	5	6	7	8		10	11	12	1
657	Bleating warbler		1	2	3	4	5	6	7	8			11	12	1
667	Ayres' cisticola				3										1
672	Rattling cisticola		1	2	3	4							11	12	1
681	Neddicky			2	3	4	5	6		8			11		1
683	Tawny flanked prinia		1	2	3	4				8			11	12	1
689	Spotted flycatcher		1	2	3	4							11	12	1
690	Dusky flycatcher		1	2	3	4		6	7	8				12	1
691	Bluegrey flycatcher		1			4	5	6	7	8			11		1
693	Fantailed flycatcher		1	2	3	4	5		7	8			11	12	1
694	Black flycatcher		1	2	3	4	5	6		8			11	12	1

696	Mousecoloured flycatcher		1	2	3	4	5	6	7	8			11	12	1	
698	Fiscal flycatcher						5	6	7						1	
701	Chin-spot batis		1	2	3	4	5	6	7	8			11	12	1	
703	Pririt batis												11		1	
705	Wattle-eyed flycatcher	I											10		1	
708	Bluemantled flycatcher					4							10	11	1	
710	Paradise flycatcher		1	2	3	4	5	6	7	8			10	11	12	1
711	African pied wagtail		1	2	3	4	5	6	7	8			11	12	1	
713	Cape wagtail						5	6	7	8			11		1	
714	Yellow wagtail		1					6							1	
716	Richard's pipit		1	2	3	4	5	6	7				11	12	1	
717	Longbilled pipit		1												1	
723	Bushveld pipit				3	4							11		1	
728	Yellowthroated longclaw		1	2	3	4	5	6	7	8			11	12	1	
731	Lesser grey shrike					4									1	
732	Fiscal shrike		1	2	3	4							11	12	1	
733	Redbacked shrike		1	2	3	4							11	12	1	
735	Longtailed shrike		1										11	12	1	
736	Southern boubou		1	2	3	4	5	6	7	8		10	11	12	1	
740	Puffback shrike		1	2	3	4	5	6	7	8		10	11	12	1	
741	Brubru		1	2		4	5	6	7	8			11	12	1	
743	Threestreaked tchagra				3	4	5	6	7	8		10	11	12	1	
744	Blackcrowned tchagra		1	2	3	4	5	6	7	8		10	11	12	1	
745	Marsh tchagra (blackcapped)					4				8			11		1	
747	Gorgeous bush shrike		1	2	3	4	5	6	7	8		10	11	12	1	
748	Orangebreasted bush shrike		1	2	3	4	5	6	7	8		10	11	12	1	
751	Greyheaded bush shrike		1	2	3	4	5	6	7				11	12	1	
753	White helmetshrike		1	2	3	4	5	6	7	8			11	12	1	
754	Redbilled helmetshrike				3	4			7					12	1	
761	Plumcoloured starling		1		3	4						10	11	12	1	

764	Glossy starling				3	4											1
766	Lesser blue-eared starling							6				10		12			1
768	Blackbellied starling		1	2	3	4				8			11				1
772	Redbellied oxpecker													12			1
780	Purplebanded sunbird		1			4			7	8			11	12			1
787	Whitebellied sunbird		1		3	4	5	6	7	8		10	11	12			1
789	Grey sunbird		1			4											1
790	Olive sunbird							6									1
791	Scarlet chested sunbird		1		3	4	5	6	7	8		10	11	12			1
792	Black sunbird					4											1
793	Collared sunbird		1		3	4	5	6	7	8		10	11	12			1
796	Cape white-eye					4	5	6		8			11				1
797	Yellow white-eye	I	1		3	4								12			1
804	Greyheaded sparrow					4							11				1
805	Yellowthroated sparrow				3	4	5			8		10	11	12			1
807	Thickbilled weaver						5	6	7	8		10	11	12			1
808	Forest weaver		1	2	3	4	5	6	7	8		10	11	12			1
810	Spectacled weaver		1	2	3	4	5	6	7			10	11	12			1
811	Spottedbacked weaver		1	2	3	4				8			11	12			1
814	Masked weaver		1	2									11	12			1
815	Lesser masked weaver		1									10	11	12			1
817	Yellow weaver		1	2				6	7			10	11	12			1
818	Browthroated weaver													12			1
821	Redbilled quelea		1	2									11	12			1
824	Red bishop		1	2	3									12			1
825	Firecrowned bishop												11				1
828	Redshouldered widow		1	2									11	12			1
829	Whitewinged widow		1	2	3									12			1
832	Longtailed widow													12			1
834	Melba finch		1	2	3			6						12			1

835	Green twinspace													12	1
838	Pinkthroated twinspace				4		6	7	8				11		1
840	Bluebilled firefinch		1	2	3	4								12	1
841	Jameson's firefinch							7							1
842	Redbilled firefinch		1	2	3		5							12	1
844	Blue waxbill		1	2	3	4	5	6	7	8		10	11	12	1
846	Common waxbill		1	2	3	4	5	6		8			11	12	1
848	Grey waxbill				3		5								1
857	Bronze mannikin		1	2	3	4	5	6					11	12	1
858	Redbacked mannikin							6	7				11	12	1
860	Pintailed whydah		1	2	3	4							11	12	1
862	Paradise whydah		1	2	3		5							12	1
864	Black widowfinch													12	1
869	Yelloweyed canary		1	2	3	4	5	6		8			11	12	1
884	Goldenbreasted bunting		1	2	3	4	5	6	7	8		10	11	12	1

304 species have been recorded on the reserve, of which 34 are Red Data species. The 120 wetland associated and/or dependent species are highlighted. Of these 120 wetland associated species, 21 are Red Data species. 19 of the 21 Red Data species are waterbirds.

### LEGEND:

#### Red Data categories:

E = Endangered

V = Vulnerable

R = Rare

I = Indeterminate (rare or vulnerable).

#### Status codes:

1 = Present

2 = Suspected breeding

3 = Proven breeding

4 = Eggs

5 = Chicks

6 = Eggs and chicks





**APPENDIX 3**

**LIST OF BIRDS RECORDED AS PART OF S.A. RAMSAR WORKING GROUP  
COORDINATED WETLAND COUNT (5 JULY 1992).**

Robert's No.	English name	Red Data	Count
49	White Pelican	R	20
58	Reed Cormorant		10
63	Blackheaded heron		2
66	Great white egret		9
67	Little egret		3
87	Openbill stork	R	25
90	Yellowbill stork	R	4
91	Sacred ibis		25
93	Glossy ibis		206
94	Hadedda ibis		2
95	African spoonbill		5
96	Greater flamingo	I	103
97	Lesser flamingo	I	120
99	Whitefaced duck		1896
100	Fulvous duck		4
102	Egyptian goose		158
114	Pygmy goose	R	206
115	Knobbilled duck		27
116	Spurwined goose		1241
148	African fish eagle		6

213	Black crane		1
226	Moorhen		2
240	African jacana		7
241	Lesser jacana	R	
249	Threebanded plover		12
258	Blacksmith plover		11
264	Common sandpiper		45
269	Marsh sanpiper		1
272	Curlew sanpiper		32
295	Blackwinged stilt		35
428	Pied kingfisher		4
713	Cape wagtail		4
	Unidentified tern		10
TOTAL COUNT			4240