

Information Sheet on Ramsar Wetland St Lucia System

1. DATE

30 October 1998

2. COUNTRY

South Africa

3. NAME OF WETLAND

St Lucia System (forming a part of the Greater St Lucia Wetland Park)

4. GEOGRAPHICAL COORDINATES

32.46597°E; 28.07224°S (for the centre of the site).

5. ALTITUDE

0 - 130 msl

6. AREA

155 000 ha

7. OVERVIEW

The system consists of a complex arrangement of coastal dune forest, marine, estuarine and fresh water wetlands and hygrophilous grassland. The area is rich in biodiversity and is a sanctuary for many rare and endangered species. It encompasses a number of life support systems.

8. WETLAND TYPE

Marine Coastal categories: E F

Inland Wetland Categories: L M O Tp TS U W Xf Xp Y

9. RAMSAR CRITERIA

1a, 1c. 3a, 3b.

2a, 2b, 2d. 4a, 4b.

10. MAP

See attached.

11. NAME AND ADDRESS OF THE COMPILER OF THIS FORM

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12. JUSTIFICATION

Criterion 1: Unique and representative wetlands.

12.1 Criterion 1a.

The St Lucia System is an outstanding example of a natural wetland system on the south-east coast of Africa.

The St Lucia System is an outstanding example of one of the few, and possibly the only, remaining moist, coastal, subtropical natural area with its associated wetland systems within the African Savanna Biome sufficiently large enough for the existing and original ecological and biological processes to operate without interference. The environmental heterogeneity and variability characteristic of the Maputaland coastal region in which the site is situated, is expressed by the climate, where evaporation exceeds precipitation and wet and dry periods of several years duration occur, by the geology and soils which range from eutrophic to dystrophic conditions, and by the diversity of terrestrial, wetland, estuarine, coastal and marine physiographic features. Associated with this remarkable environmental heterogeneity and variability is an equally remarkable diversity in the natural biota. All the species of plants and animals and therefore all the elements that historically are known to have been present within the area still occur with the exception of lion and elephant. The high species richness

is outstanding. This is due to several factors including the site's regional position at the interface between tropical and subtropical African biota, the complexity of this transition, past speciation events within the Maputaland Centre of Endemism, many successful dispersal and establishment events of the past, and the wide diversity of habitats with their available rich resources.

The site contains landscapes and features of exceptional natural beauty. Coastal and mainland areas outside of the site have been substantially modified to the extent that they have lost their pristine wild character. In such a site that is so geographically and biotically diverse, wild distinctive and spectacular, it is not possible to list all the features of high aesthetic importance and thus only a few superlative examples are given.

Superlative scenic vistas of significant natural beauty include:

- The high forested coastal dune cordon, uninterrupted throughout the entire length of the area, the wide deserted sandy beaches and Indian Ocean to the east and Lake St Lucia and associated mosaic of wetlands, grasslands and forests to the west;
- The pristine, low-nutrient, coastal lakes of Bhangazi North and Bhangazi South and the vast St Lucia Lake, contrasting with their backdrop of high, forested, coastal dunes;
- The vast Mkuzi swamp with its expansive reedbeds and its pans covered in water lilies, and the large Mfabeni swamp forest.

The wetland areas are known for having several superlative natural spectacles, including:

- Herds of hippopotamus in the water or on the reed banks of Lake St Lucia;
- Displays of feeding flamingos, pelicans, waders, and other waterfowl;
- Breeding colonies of pelicans, yellow-billed storks, herons, Caspian terns, spoonbills and Redwinged pratincoles; and
- The basking and nesting sites of the Nile crocodile.

12.2 Criterion 1c.

The St Lucia System is an outstanding example of a wetland which plays a substantial hydrological, biological and ecological role in the natural functioning of a coastal system.

The St Lucia System is situated within the Greater St Lucia Wetland Park which is a protected area established in law. From a nature conservation perspective the area is irreplaceable. It is considered that all the processes that have led to and influenced the evolution of the wide diversity of terrestrial, freshwater and estuarine ecosystems, together with their component plants and animals, have not been significantly disrupted by external agents and are therefore still functioning. The ecological processes within the terrestrial and aquatic ecosystems in the area, and which control the population dynamics of the plants, invertebrates and vertebrates, are usually present at both micro and macro scales. They typically include such major processes as primary production, input and cycling of nutrients, decomposition, inter- and intra-specific competition, disease, parasitism, herbivory, predation and migration. In addition, these systems are characterized by their biotic responses to natural disturbance processes that occur usually at a more local level, at different frequencies and intensities. Such disturbance processes include flooding, drought, area-selective grazing and browsing and the burning of vegetation.

A remarkable phenomenon requires special mention. Linked to the climatic cycle of a period of wet years followed by a dry period of years, salinity states within Lake St Lucia respond accordingly, ranging from freshwater to hypersaline conditions. With this change in the aquatic environment, there is a corresponding shift in the biodiversity of the system. Under freshwater to low salinity states, submerged macrophytes increase, attracting large numbers of ducks and other waterfowl. During medium salinity states, populations of benthic organisms increase and fish, fish-eating birds and crocodile populations expand. During high salinity states both phytoplankton and zooplankton increase attracting large concentrations of feeding flamingos.

Criterion 2: Presence of important and unique plants and animals

12.2 Criteria 2a & 2d.

The St Lucia System supports a large and diverse assemblage of plants and animals, many of which are either rare, vulnerable or endangered. Several endemic species also occur.

The diversity of habitats contained within the Park is outstanding. The range in habitat diversity is from the sandy and rocky terrestrial environment with its various types of grasslands, thickets, woodlands and forests, to the saline and fresh water (mesotrophic to oligotrophic) wetlands and their wide range of swamps, grasslands, salt marsh, mangroves, swamp forests and riparian forest habitats.

Found within these habitats is a remarkable richness of plant and animal species, for example, some 2 180 species of flowering plants have been recorded as well as 52 species of dragonflies, 115 species of benthic amphipods, 41 species of terrestrial molluscs, 55 species of fresh water fish, 212 species of estuarine fish, 521 species of birds and 97 mammal species. Knowledge of many taxonomic groups occurring in the area is poor, particularly lower plants and invertebrate groups. However, those taxonomic groups that have been researched clearly indicate the universal nature of the species richness contained in this area. It is likely that the biotic communities contain all or most of their component species, with the exception of lion and elephant.

Within the diversity of habitats contained in the area are those supporting populations of rare and endangered species. Viable populations of all the listed threatened national and internationally important terrestrial and freshwater groups breed successfully. Internationally threatened species include the Black rhinoceros, Nile crocodile and six species of freshwater fish.

Although endemism is not a major feature of this biota, there are significant numbers of either South African, KwaZulu-Natal, or site endemic species. The site is located within the Maputaland centre of endemism and contains 46 such plant species. In addition there are six fish, ten amphibian, 20 reptiles, four birds, five mammals and ten terrestrial mollusc species recorded for the area that are listed as South African endemics. Within the site itself, nine species or sub-species have been listed as endemics.

12.4 Criterion 2b.

The St Lucia System is of special conservation value for maintaining the genetic and biological diversity in the Maputaland coastal area.

Population sizes, particularly of all resident species in the area, are believed to be sufficiently large and heterogeneous to ensure their genetic integrity. Also management has paid attention to ensuring that re-establishment programmes do not result in genetic contamination.

Criterion 3: Waterfowl.

12.5 Criteria 3a & 3b.

The St Lucia System supports a rich diversity of avifauna including waterfowl species, and at times very large concentrations occur.

High species richness is reflected in the avifauna of the Greater St Lucia Wetland Park with a checklist of 521 species representing 60% of the South African avifauna. This is a consequence of the wide variety of terrestrial, wetland and aquatic habitats in the area and its geographical position either as a destination or a stop-over for migratory species. There are 47 subspecies of birds that are endemic or near-endemic species to the region in which the site is situated, and the area contains populations of four South African endemics. It is one of the principal avifaunal breeding areas in South Africa as 339 bird species (62% of the total list) are known to or are considered to breed here. The St Lucia System is of particular importance as a breeding area for the Pinkbacked pelican *Pelecanus rufescens*, White pelican *Pelecanus onocrotalus*, Caspian tern *Hydroprogne caspia*, Pygmy goose *Nettapus auritus*, Rufousbellied heron *Butorides rufiventris*, Redwinged pratincole *Glareola pratincola*, and Greyrumped swallow *Pseudhirundo griseopyga*. The Park provides habitat for the principal populations in South Africa of Osprey *Pandion haliaetus*, Neergaard's sunbird *Nectarinia bifasciata*, Woodward's batis *Batis fratrum*, Natal nightjar *Caprimulgus natalensis*, Blackrumped bottom-quail *Turnix hottentotta*, Black coucal *Centropus bengalensis* and Short tailed pipit *Anthus brachyurus*.

A total of 97 migrant bird species (19% of the total list) have been recorded, of which 23 species breed within the Park. Lake St Lucia and its associated wetlands form one of the most important refuges on the Southern African subcontinent for large numbers of many species of migratory waterfowl and wetland birds. Of approximately 200 water bird species recorded for the Park, the migratory species are waders (31 species), ducks and geese (15 species), flamingos (2 species), herons and egrets (15

species). A notable feature occurs during hypersaline states of Lake St Lucia when concentrations of flamingos reach up to 50 000 birds.

A total of 62 birds occurring in the area have been listed in the South African Red Data Book, and there are 73 species which are listed in CITES appendices.

Criterion 4: Fish

12.6 Criteria 4a & 4b.

The St Lucia System supports populations of a large number of indigenous fish species, including populations of several endemic species. Lake St Lucia is a highly important nursery for fish.

The fresh water fish fauna of the St Lucia System comprises 55 species with 22 species found in the Mgobezeleni system, 14 species in the Mkuzi system, 11 species in Lake Bhangazi North and 13 species in Lake Bhangazi South. There are six South African endemics including five KwaZulu-Natal endemic freshwater fish species, and a total of 22 freshwater species reach their southern limit of distribution in the area. Six species are listed in the International Red Data Book. Sixteen species are listed in the SA Red Data Books.

A total of 212 estuarial species have been recorded. The shallows of Lake St Lucia, and the off-shore marine reefs sustain large concentrations of larval and juvenile forms of marine life, including fish, prawns, crabs and other aquatic organisms. The lake, by virtue of its large size, and the provision of shelter and feeding grounds, is the most important nursery area for these aquatic organisms on the east coast of South Africa. One of the largest fish species in both freshwater and estuarine systems in the Park is the Zambezi Shark *Carcharhinus leucas*, which attains a weight of up to 214 kg. Although primarily a pelagic sea fish, it has the ability to tolerate fresh water for prolonged periods.

13. GENERAL LOCATION

The St Lucia System is on the south-eastern coast of Africa in the province of KwaZulu-Natal of the Republic of South Africa. The village of St Lucia is approximately 200 km north of the port of Durban.

14. PHYSICAL FEATURES

14.1 Climate

The Park has a subtropical climate with warm, moist summers (mean annual temperatures exceed 21°C), and mild dry winters. Rainfall at the coast varies from 1 200 - 1 300 mm per annum, with 60% of the rainfall in summer (November to March) and the remainder in winter (May to September). Episodic large scale floods occasionally occur, caused by tropical cyclones moving down the Mozambique Channel. Normal floods are usually due to cut-off lows.

Evaporation rates are high, especially during the drier winter and early spring periods. The annual average evaporation in the coastal zone is approximately 1 300 mm. The prevailing regional winds tend to be parallel to the coast, blowing from the north-east or from the south-west.

14.2 Geology

The geology within the St Lucia System site comprises Cretaceous sedimentary rocks of the St Lucia Formation which are rich in fossil remains, including ammonites up to a metre in diameter, bivalves, gastropods, echinoids and foraminifera, and are exposed over extensive areas. The sediments have a shallow dip towards the east, thus the oldest rocks are exposed in the west in False Bay, and the youngest along the Western Shores of Lake St Lucia.

The Cretaceous rocks are overlain by the Maputaland Group sedimentary rocks of Neogene and Quaternary age, in the form of relict beach-dune ridges which record a succession of depositional events related to Neogene and Pleistocene sea level fluctuations. Pleistocene sediments form a thin veneer over the Neogene and Cretaceous rocks. These consist of poorly exposed fossiliferous Port Durnford Formation sediments, which consist of mudstone, lignitic clay, sand and corals, laid down about 120 000 yrs B.P. These are largely covered by unconsolidated dune sands. During the early part of the Holocene, the Flandrian transgression, which reached its peak about 5 000 years ago, caused erosion of the coastal dune barrier. During this time, redistribution of the terrestrial sand cover took place.

14.3 Physiographic formations

These comprise a long flat coastal plain with associated lakes and pans, interspersed with relict dune cordons. To the west the coastal plain abuts the rugged linear Lebombo mountain range and to the east, the coastal plain is separated from the long linear shoreline by a large continuous barrier dune complex.

The coastal plain represents the depositional lowlands for several large rivers. The coastal plain may be subdivided into five component terrestrial and aquatic landscape units all of which are present in the sites, these are:

- C the gently undulating terrain at the base of the Lebombo Mountains;
- C sandy ridges;
- C coastal lake systems;
- C coastal dunes; and
- C river - related systems.

During the Quaternary period, the coastal plain underwent a long period of sedimentation and erosion, related to marine transgressions and regressions. During each regression, stratified marine deposits were re-worked, eroded and redistributed by marine and sub-aerial agents to form a series of prominent north-south orientated sandy dune ridges which are a conspicuous feature of this landform of very low relief. Calcimorphic clay to sandy clay loam soils predominate with valley floors having higher proportions of clay and vertisols being fairly common and dominant in some areas.

Two types of coastal lake systems are present, as either estuarine-linked lakes (St Lucia), or fresh water lakes (Bhangazi North, Bhangazi South, Ngobozeleni). Lake St Lucia is the largest estuarine system of the African continent being approximately 36 826 ha in extent. It is a shallow system having an average depth of less than one metre. Water in Lake St Lucia is predominantly saline and only the extreme upper sections and the mouths of the feeder rivers are fresh water when inputs are high. Under dry or drought conditions, salinity levels rise and may result in very high levels being recorded in the upper sections of the system. The Mkuzi swamps were formed by sedimentation of the upper reaches of a drowned valley of a former palaeo-lagoon. The Mfolozi swamps had a similar origin, but the palaeo-lagoon was transformed into a wetland due to the input of sediments transported by the Mfolozi River.

The freshwater lakes, Bhangazi North and Bhangazi South, are located in areas of low relief in large depressions in close vicinity to, and on the landward side of the coastal dune barrier. The lakes receive some of their water supplies from relatively small catchments. Replenishment is largely from groundwater seepage. The lakes are nutrient-poor because of the predominantly sandy, leached nature of the substrate. Bhangazi South is at the northern extremity of the Mfabeni Depression, which is on average about eight metres above mean sea level, and drains southwards into Lake St Lucia via the Mfabeni depression and the Nkazana stream. It is approximately 250 ha in extent and has a mean depth of 4-5 m.

The forested coastal dune system is a prominent landscape feature of the eastern edge of the Coastal Plain. This linear system consists of bi-directional parabolic dunes that have resulted from the effects of coast-parallel prevailing winds.

15. HYDROLOGICAL VALUES

Lake St Lucia obtains its freshwater supplies from five river systems. These are the Mkuzi (catchment c. 6 000 sq km²), Hluhluwe (catchment c. 1 000 km²), Mzinene (catchment c. 800 km²), Mpate (catchment c. 65 km²) and Nyalazi (catchment c. 700 km²). The major portions of these catchments lie outside the boundaries of the Park. The Mfolozi River (catchment c. 10 000 km²) formerly had a common mouth with the St Lucia estuary.

The hydrological regime of Lake St Lucia is dynamic, as the system has a high surface area to volume ratio and is thus very sensitive to the effects of evaporation. Principal inputs to the water budget are rainfall and streamflow. Water losses are occasioned by evaporation and discharge to the sea. The amount of water lost by evaporation exceeds the amount received from rainfall, even in years of average or above-average precipitation.

The amount of fresh water received from streams and rivers is a major determinant of the salinity state of the overall system and its sub-components. During average to above-average rainfall seasons, the salinity gradient ranges from a fresh water state near river mouths to that of sea water (35 parts per thousand) in the estuary. In addition, the water level of the lake rises, resulting in a net discharge of water to the

sea.

In periods of drought, more water is lost from evaporation than enters the lake from river-flow. Lake level falls below mean sea level, and should the mouth be open, a net inflow of sea water occurs and salinity levels rise. During extended periods of drought, the lake becomes hypersaline. Compartments of the lake system furthest from the estuary mouth may attain salinity levels up to three times greater than that of sea water. Under these conditions, the salinity gradient is reversed, with the relatively least-saline areas closer to the mouth. Hypersaline conditions have been recorded as occurring on average for about two years duration each decade.

Changes in spatial and temporal salinity levels exert major influences on the biota of the lake. Because each aquatic species has an individual salinity-tolerance level, the response to salinity changes is a continual flux of species population levels. Consequently the lake is a dynamic ecosystem which imposes a high degree of biodiversity, both in time and space.

Since the 1930's, catchment degradation and the channelling of the Mfolozi Floodplain led to sedimentation of the combined St Lucia/ Mfolozi estuary mouth, causing the mouth to close. A separate mouth for the Mfolozi river was constructed to the south of St Lucia estuary in 1952. A management programme for the operation of a dredger that maintains open mouth conditions of the St Lucia estuary, as determined by nature-based operating rules, has been implemented.

16. ECOLOGICAL FEATURES

The vegetation of the Park is extremely diverse, and consists of a mosaic of forest, thickets, woodlands, grassland and wetland types, the distribution of which is largely determined by topography, moisture regimes and edaphic conditions.

16.1 Wetland Types

Freshwater Phragmites and papyrus swamp.

Poorly conserved elsewhere in South Africa, this community covers approximately 7 000 ha in the Park. It occurs on organic and alluvial soil in the upper (freshwater) Mkuzi swamps, and forms the largest wetland in any protected area in South Africa. Characteristic species are *Cyperus papyrus* and

Phragmites australis.

Saline reed swamp.

This community provides detritus and shelter for estuarine organisms and grows on saline alluvial soils. It is found on islands in Lake St Lucia and forms a narrow fringe zone around the lake. The characteristic species is *Phragmites mauritianus*.

Eleocharis (sedge) swamp.

This swamp community is not conserved in any other South African protected area. It occurs principally in the Mfabeni Swamp and also in limited localities on the eastern and western shores of Lake St Lucia. It grows on organic soils. The characteristic species is *Eleocharis limosa*.

Salt marsh.

Juncus (ncema) is a commercially important plant to Zulu people being used for weaving traditional sleeping mats. It is found on saline and freshwater wetland soils, along the margins of the lake and islands. Characteristic species are *Sporobolus virginicus*, *Paspalum vaginatum*, *Juncus kraussii*, *Salicornia* spp., and *Ruppia maritima*.

Submerged macrophyte beds.

A habitat rich in nutrients, it supports many fish and crustaceans, which are predated by a wide variety of water birds. It grows on saline lake-bottom soils. Characteristic species are *Potamogeton pectinatus*, *Ruppia cirrhosa*, and *Zostera capensis*.

16.3 Grassland Types

Hygrophilous grassland on sand.

This is a grassland type which is poorly conserved in other protected areas in South Africa. It provides highly palatable grazing for many herbivore species. It is found on transported, sandy riverine soils. Characteristic species are *Acroceras macrum* and *Ischaemum arcuatum*.

High-lying grasslands on sand.

An important habitat for herbivores which is poorly conserved elsewhere in South Africa. It is a fire-subclimax community, diverse in terms of species and life forms, and containing many species of shrubs, herbs, lianas and grasses. It occurs on well-drained regic sands of the coastal plain. Characteristic species are: *Aristida junciformis*, *Themeda triandra*, *Imperata cylindrica*, *Cymbopogon validus*, *Helichrysum kraussii*, *Diospyros villosa*, *Thesium spp.*, *Cassytha filiformis* and *Smilax kraussiana*.

Echinochloa floodplain grassland.

This grassland type is poorly conserved elsewhere in South Africa, being found on seasonally inundated floodplains of the larger rivers (Mkuzi and Mfolozi). It provides highly palatable grazing for herbivores. Where it occurs outside of protected areas it is threatened by cultivation. Characteristic species are *Echinochloa pyramidalis*, *Eriochloa spp.*, *Sorghum spp.*, and various Cyprus species.

16.3 Swamp forest

This community is extremely rare in South Africa with a total extent of approximately 4 843 ha. An estimated 64% (3 095 ha) of pristine swamp forest occurs in the Park. It plays a vital protective (filtration) role for wetlands. It provides habitat for many rare species, especially birds. Characteristic species are *Ficus trichopoda*, *Voacanga thouarsii*, *Syzygium cordatum*, *Barringtonia racemosa*, *Phoenix reclinata*, *Macaranga capensis*, *Bridela micrantha*, *Psychotria capensis*, *Tarenna pavettoides*, *Psilotum nudum*, *Stenoclaena tenuifolia* and *Nephrolepis biserrata*.

16.4 Mangroves

Mangroves provide habitat for a number of species that are confined to this habitat. It is conserved in only one other protected area in South Africa and is found growing in the intertidal zone of St Lucia estuary. Characteristic species are *Bruguiera gymnorhiza* and *Avicennia marina*.

16.5 Woodland types

Palm veld.

Palm veld is not conserved in any other protected area in South Africa. It is a

fire-subclimax community, however excessive burning maintain palms in a stunted form. It is an important habitat for herbivores. Characteristic species are *Hyphaene coriacea*, *Phoenix reclinata* and grass species as above.

Riverine woodland.

Riverine woodland provides moderate quality grazing and browsing for herbivores and is of great importance for the stabilization of banks of feeder rivers to Lake St Lucia. Poorly conserved elsewhere in South Africa, it grows on the upper fertile alluvial terraces of the Mkuzi and Msunduzi Rivers. Characteristic species are *Ficus sycomorus*, *Acacia zanthophloea*, *Rauvolfia caffra*, *Acacia schweinfurhii*, *Axima tetraacantha*, *Panicum spp.*, *Sporobolus spp.*, and *Eriochloa spp.*

Coastal thicket on seaward-facing dune cordon slopes.

This community differs from coastal dune forest in physiognomy, and in principal dominants, but otherwise there is little difference in structure and thus can be considered a floristic gradient of dune forest. The low habit is maintained by salt spray and exposure, mainly to strong winds and therefore plays a vital role in protecting the slopes of the foredune. It is an important bird habitat which also provides browse for other herbivores. It grows on the steep/ precipitous seaward-facing slopes (regic sands) of the dune cordon. Characteristic species are *Eugenia capensis*, *Brachylaena discolor*, *Euclea natalensis subsp. rotundifolia*, *Diospyros rotundifolis*, *Mimusops caffra*, *Chrysanthemoides monilifera*, *Apodytes dimidiata*, *Erythroxylum emarginatum*, *Strelitzia nicolaii* and *Hibiscus tiliaceus*. Dune pioneers include *Scaevola thunbergii*, *Thoicissus digitata*, *Cynanchum obrusifolia*, and *Ipomoea wightii*.

16.6 Forest Types

Coastal dune forest.

Coastal dune forest provides habitat for many specialised coastal forest bird, mammal and other faunal species and plays an important role in protecting the loose (regic) dune sands, especially the upper humic nutrient layer. It is a highly complex climax community of the coastal dune cordon where light rainfall occurs. Distinct floristic gradients occur across the dune cordon and the community is accordingly rich in species. It may reach up to 30 m in

height in protected sites, but is usually characterised by a dense shrub layer, and many lianes. Characteristic species are *Mimusops caffra*, *Grewia occidentalis*, *Psychotria capensis*, *Peddiea africana*, *Ficus burtt-davyi*, *Diospyros natalensis*, *D. rotundifolia*, *D. inhacaensis*, *Euclea natalensis*, *Apodytes dimidiata*, *Brachylaena discolor*, *Ziziphus mucronata*, *Carissa bispinosa*, *Dracaena hookeriana*, *Isoglossa woodii*, *Panicum deustum*, *Digitaria diversinervis*, *Tragia durbanensis* and *Sansevieria hyacinthoides*.

Coastal lowland forest.

This is the largest remnant of this forest type in South Africa which is not well protected in other protected areas. It is a mixed, subtropical climax community, and the best developed stands may reach 30 m in height. Drainage lines are occupied by swamp forest. This community provides habitat for many forest bird, mammal and other forest faunal species and grows on highly leached (nutrient-pool), recent wind-deposited sands. Characteristic species are *Strychnos decussata*, *S. gerrardii*, *Hymenocardia ulmoides*, *Canthium inerme*, *Scolopia zeyheri*, *Ekebergia capensis*, and the lianes *Monanthes caffra*, *Dalbergia armata*, *Landphia kirkii*, and *Uvaria caffra*.

17. NOTEWORTHY FLORA

Phytogeographically, the site is at the southern end of the Maputaland Centre of endemism. The Maputaland Centre is bounded in the north by the Limpopo River, in the west by the Lebombo Mountains, and in the south by the St Lucia estuary.

The flora of the Park is representative of the floristic region in which it lies. The Maputaland Centre has a high species richness with about 1 800 plant species. A total of 2 173 species have been recorded for the Park being 98% of the flora for the centre. It is a highly diverse flora with 152 families and 734 genera present.

The area has a notable number of endemics. At least 168 species and intra specific taxa are considered to be endemic or near-endemic to the Maputaland Centre. Of these, 44 (27%) are found in the Greater St Lucia Wetland Park while six species are KwaZulu-Natal endemics and three species are known only from the Park. As one of the few protected areas in the Maputaland Centre of Endemism, the Greater St Lucia Park contributes to the maintenance of populations of endemics in the sub-region, but

at the southernmost extent of their distribution range.

Taxa of phytogeographical interest include the following:

- C *Helichrysoopsis septentrionale*, a Maputaland endemic and a monotypic genus is found in the Park;
- C Four regional endemic genera, *Brachychloa*, *Ephippioarpa*, *Helichrysoopsis* and *Inhambanella*, are represented in the Park;
- C Some 136 species reach their southernmost limit of distribution in the Park;
- C The endemic *Restir zuluensis* is remarkable in that it has few affinities with other Restionaceae to the north or to the south;
- C One aquatic plant is of interest: *Wolffiella welwitschii*, a recently discovered freshwater endemic is the smallest flowering plant in southern Africa;
- C A new species of small grassland aloe with affinities to *Aloe parviflora* awaits description. It is endemic to the Park and is confined to the Eastern Shores area; and
- C *Kalanchoe luciae* subsp. *luciae*, described recently, takes its name from the Park, and is endemic to the Park.

18. NOTEWORTHY FAUNA

Lake St Lucia and its associated fresh water systems provide habitat for one of the largest populations of Nile crocodile *Crocodylus niloticus* on the sub-continent. It is estimated that approximately 1 500 individuals over 2 m long are present. The species is an important predator within aquatic systems in the Park.

High species richness is reflected in the avifauna of the area with a checklist of 521 species representing 60% of the South African avifauna. This is a consequence of the wide variety of terrestrial, wetland and aquatic habitats in the area and its geographical position either as a destination or a stop-over for migratory species. There are 47 subspecies of birds that are endemic or near-endemic species to the region in which the St Lucia System is situated, and the area contains populations of four South African endemics. It is one of the principal avifaunal breeding areas in South Africa as 339 bird species (62% of the total list) are known to or are considered to breed here. The Park is of particular importance as a breeding area for the Pinbacked pelican *Pelecanus rufescens*, White pelican *Pelecanus onocrotalus*,

Caspian tern *Hydroprogne caspia*, Pygmy goose *nettapus auritus*, Rufous-bellied heron *Butorides rufiventris*, Redwinged pratincole *Glareola pratincola*, and Greyrumped swallow *Pseudhirundo Griseopyga*. The Park provides habitat for the principal populations in South Africa of Osprey *Pandiion haliaetus*, Neergaard=s sunbird *Nectarinia bifasciata*, Woodward's batis *Batis fratrum*, Natal nightjar *Caprimulgus natalensis*, Blackrumped button-quail *Turnix hottentotta*, Black coucal *Centropus bengalensis* and Short tailed pipit *Anthus brachyurus*.

A total of 97 migrant bird species (19% of the total list) have been recorded, of which 23 species breed within the Park. Lake St Lucia and its associated wetland form one of the most important refuges on the Southern African subcontinent for large numbers of many species of migratory waterfowl and wetland birds. Of approximately 200 water bird species recorded for the Park, the migratory species are waders (31 species), ducks and gees (15 species), flamingos (2 species) and herons and egrets (15 species). A notable feature occurs during hypersaline states of Lake St Lucia when concentrations of flamingos reach up to 50 000 birds.

A total of 62 birds occurring in the Park have been listed in the South African Red Data Book, and there are 73 species which are listed in CITES appendices.

Viable breeding populations of 97 terrestrial mammal species are present. The terrestrial mammal fauna of the St Lucia System is particularly species-rich in the southern African context as it has 22% of the Insectivora, 32% of the Chiroptera, 51% of the Carnivora, 53% of the Artiodactyla and 21% of the Rodentia known for the sub-continent.

The Park supports the largest single populations of the following species in South Africa; Hippopotamus *Hippopotamus ampibius*, Red duiker *Cephalopus natelensis natalensis*, Nyala *Tragelaphus angasii* and Southern reedbuck *Redunca arundinum*. In addition, the Park supports the largest formally protected populations in KwaZulu-Natal of the following species: Thick tailed bushbaby *Otolemur crassicaudatus*, Samango monkey *Cercopithecus mitis*, Side-striped jackal *Canis autoists*, Banded mongoos *Mungos mungo*, Brown hyaena *Hyaena brunnea*, Steenbok *Raphicerus campestris*, Impala *Aepyceros melampus*, Bushbuck *Tragelaphus scriptus*, Tonga red squirrel *Paraxerus palliatus tongensis*, Cane rat *Thryonomys swinderianus* and Four-

toed elephant shrew *Petrodromus tetradactylus*.

Other terrestrial species of particular note include:

- C Black rhinoceros *Diceros bicornis*, which has an increasing population from the present number of 95 individuals;
- C White rhinoceros *Ceratotherium simum*, which has an increasing population from present estimate of 150 individuals;
- C Five South African endemic species or sub-species are present, namely: the Hottentot Golden Mole *Amblysomus hottentotus*, the Hairy slit-faced bat *Nycteris hispida*, the Natal Red Hare *Pronolagus crassicaudatus*, the Tonga red squirrel *Paraxerus palliatus tongensis*, and the Red duiker *Cephalophys natalensis natalensis*, the latter having a population of approximately 1 000 in the Park
- C Nine species or sub-species reach their southern most limits of distribution in the Park. They include four bats: Short-eared trident bat *Cloeotis percivali*, butterfly bat *Chalinolobus variegatus*, Schlieffen=s bat *Nycticeius schlieffenii*, Anson=s free-tailed bat *Tadarida ansoni*, Side-striped jackal *Canus autoists*, Suni antelope *Neotragus moschatus*, Tonga red squirrel *Paraxerus palliatus tongensis*, Bushveld gerbil *Tatera leucogaster*, and Four-toed elephant shrew *Petrodromus tetradactylus*.

The population size of the following species have been estimated as:

| | | | |
|------------------|---------|-------------------|--------|
| White rhinoceros | 150 | Oribi | 30 |
| Black rhinoceros | 95 | Steenbok | 300* |
| Burchell's zebra | 1200** | Suni | 300** |
| Warthog | 4 000* | Impala | 9 000* |
| Bushpig | 500* | Buffalo | 170 |
| Hippopotamus | 800* | Kudu | 600 |
| Giraffe | 180 | Nyala | 8 000* |
| Blue wildebeest | 1 700** | Bushbuck | 700* |
| Red duiker | 1 000* | Southern reedbuck | 6 000* |
| Grey duiker | 1 000 | Waterbuck | 280 |

* = largest population in KwaZulu-Natal

** = second largest population in KwaZulu-Natal

One species, the Black Rhinoceros *Diceros bicornis*, is listed as endangered in the International Red Data Book, 22 species are listed in the South African Red Data Books and 18 species appear in CITES appendices.

19. SOCIAL AND CULTURAL VALUES

Almost the entire area of the site is in an unmodified, near-pristine condition. Portions of the Park have been formally protected for almost a century, being among the oldest areas set aside for conservation in Africa. The area, although utilised by man for thousands of years, has never been occupied by significantly large human settlements, nor has the area been subjected to significant man-induced land-use disturbances. Indeed, the presence of stone age and iron age man is likely to have contributed to the diversity of habitat types in some areas. The largest area transformed in recent history, representing approximately 2% of the total area (5 000 ha) is an area of plantation in the Eastern Shores component of the Park. In addition, a system of roads used by visitors, and for management purposes, has been established in the Mkuzi Game Reserve and Eastern Shores components. Sensitively planned accommodation is provided within designated development nodes at Mantuma, Sodwana Bay, Cape Vidal, Fanie=s Island, Charter=s Creek and Mapelane, according to an Ecotourism Concept Development Plan. Based on the principles of Integrated Environmental Management, the ecotourism plan is designed to provide appropriate and sustainable access to the resources within the Park, while ensuring the protection of the natural resource-base, and the equitable distribution of benefits to local communities and the region. It is estimated that approximately 1% or less of the area of the Park has been transformed by these developments. The natural ecological and geomorphological processes function with little or no significant detrimental interference by the activities of man. Where there have been impacts, the Park management approach is to restore such areas to their former status.

20. LAND TENURE/ OWNERSHIP

All the land comprising the Greater St Lucia Wetland Park is state-owned, being registered in the name of the President of the Republic of South Africa. Control and management of the Park has been delegated by the KwaZulu-Natal Provincial Administration to the KwaZulu-Natal Nature Conservation Service.

21. CURRENT LAND USE

The entire area of the St Lucia System site lies within the proclaimed protected area components of the Greater St Lucia Wetland Park. The land-use is therefore nature conservation together with nature-based tourism. Land-use in adjoining areas are rural agriculture and plantation forestry.

22. FACTORS AFFECTING THE ECOLOGICAL CHARACTER OF THE SITE

Threats which potentially affect the integrity of the ecological functioning of the Park include:

- C possible land use changes within certain Park component areas; and
- C a reduction in the supply of critical resources.

The earliest identified threat was the possible closure of the St Lucia estuary mouth by sedimentation. The threat arose from the transformation of the upper portion of the Mfolozi Swamps by agriculture. Large levees were constructed along the banks of the Mfolozi River for flood protection, particularly for sugar-cane growers. This allowed for the sediments carried by the river to be deposited in the in-shore environment immediately to the south of the St Lucia estuary. The north flowing inshore current then moved these sediments into the mouth of the estuary, causing the temporary closure of the mouth. This threat has been managed by the Natal Parks Board since 1957 using a dredging operation, according to nature-based guidelines.

The threat of an inadequate amount of fresh water supplied by the feeder rivers to Lake St Lucia is longstanding and arises from the possibility of additional dam construction or increased levels of water abstraction within the catchments of these systems. The South African Government's Kriel Commission of Enquiry made recommendations concerning this threat as long ago as 1966, but the implementation of important recommendations was delayed until recently. The policy of the South African Government and the Department of Water Affairs and Forestry is to ensure adequate supplies of water to users, including the natural environment. This has been included in the new Water Law which ensures an amount of water, referred to as the ecological reserve, to maintain the natural environment. A recent multi-disciplinary workshop jointly organised by the Department of Water Affairs and Forestry and the Natal Parks Board, sought to determine the amount of water required for the

maintenance of the Lake. Current rates of water abstraction are relatively low and possibly not significant. No large water storage dams have been built, although there are two medium-sized dams in the upper reaches of the White Mfolozi and Hluhluwe rivers. Nevertheless, future research will be required in order to ensure that supplies of freshwater are adequate for the Lake.

Plantations of the alien pine *Pinus elliottii* and *Eucalyptus spp.* had been established in the region over a period of about 35 years since the mid-1950's. Although the more intensively planted areas were situated to the west of the Park, an area of approximately 5 000 ha was established in the Eastern Shores State Forest component area. Prior to the incorporation of this area into the Park, the decision was taken by Government authorities in 1989 to halt the establishment programme on the Eastern Shores, and to phase out the existing plantations as they are harvested. Areas which have since been clear-felled or where infestations of alien plants have been eradicated show marked re-colonization by natural vegetation, although follow-up treatment programmes will be necessary. It is anticipated that the application of management programmes in the restoration of former plantations will result in the area once again supporting natural assemblages of plants and animals.

In 1972 and 1976, prospecting rights were granted by the Department of Mineral and Energy Affairs to a private mining company for an area of 3 460 ha within the coastal dune system of the Eastern Shores component of the Park. Results showed a large deposit of ilmenite (a titanium ore) to be present, which resulted in an application for a mining lease in 1988. A large number of environmental concerns and objections to mining were identified by interested and affected parties, including the Natal Parks Board, and these were brought to the attention of the South African Government. The Government instructed that an environmental impact assessment be undertaken to investigate two alternative land uses for the Eastern Shores, namely nature conservation and tourism, or mining with nature conservation and tourism. The recommendation of the independent Review Panel appointed by the government to reach a decision was that there should be no mining anywhere in the Greater St Lucia area, and this decision was ratified by Cabinet on 6 March 1996.

The context of the Park within a region where there are many impoverished communities has resulted in several claims for land in the Park. This question was addressed by the Review Panel appointed to reach a conclusion on the mining option

on the Eastern Shores. The Review Panel concluded that the ecotourism land-use option had more potential to generate opportunities for economic development in the sub-region, than any other land-use, including the resettlement of any land within the Park. Although this is a matter which still requires resolution, there is recognition of the need for local communities to be involved in the management of the Park, and to derive direct benefits from its resources and the opportunities which it provides.

Land claims have been registered by the Commission on Restitution of Land Rights for component areas of the Greater St Lucia Wetland Park and notice to this effect has been published in the South African Government Gazette. The areas are the Eastern Shores State Forest, Cape Vidal State Forest and Sodwana State Forest. In view of these areas being State-owned, the national Department of Land Affairs is the respondent and therefore has a similar role to that of any other land owner but this may differ in that the State is constitutionally and politically committed to land restitution. Thus the Department of Land Affairs is a direct stakeholder in the negotiating process and may express itself on any aspect of the claim and/ or proposed alternative solutions. The KwaZulu-Natal Nature Conservation Service has given written notice in terms of the Restitution of Land Rights Act 22 of 1994 to the Commission that it is an interested party in this matter. In addition the KwaZulu-Natal Nature Conservation Service has submitted that it will not oppose restitution, but recommends a basis for negotiating a settlement of the matter between the State and the claimants which does not include restoration of the claimed areas, but will address the needs of the claimant through a variety of models for integrated conservation and development.

The Land Claims Commissioner is reaching the point of finalization with regard to the claim against the Eastern Shores State Forest and will be presenting the draft settlement options to the claimants and the Department of Land Affairs. The report will then be submitted to the Land Claims Court and at this point all interested parties will be able to engage in the settlement process.

There is a possibility that if restoration of part of the whole area claimed is granted by the Land Claims Court, there would follow a change in either the boundaries or the zonation of the nominated site. This may affect the buffer and strict protection zoned areas (see Figure 3 where these are indicated as either moderate [buffer] or low [strict

protection] use zones). However, much progress has been made towards the establishment of Biosphere Reserve areas adjacent and to the west of the Park, in particular the Southern Maputaland Biosphere Reserve (being approximately 500 000 ha in extent). Land-uses within the possible Biosphere Reserve areas comprise extensive areas that are either nature conservation or traditional/ cultural and this would therefore result in an extension of the buffer zones for the Park.

Possibly the most serious threat is from alien invasive plants, although the area currently affected by such invasions is limited. Principal threats are posed by *Chromolaena odorata*, *Psidium guajava*, *Pereskia aculeata* and *Melia azedarach*. Management programmes which have been in operation for several decades are aimed at the elimination of all infestations within the Park. In addition, the efforts of the Plant Protection Research Institute to identify and establish a spectrum of biological control agents are supported and implemented in the Park.

23. CONSERVATION MEASURES TAKEN

The laws which establish the Park, and thus includes the St Lucia System site, as a conservation unit are the KwaZulu-Natal Nature Conservation Management Act No.9 1997, the Natal Nature Conservation Ordinance No.15 of 1974, the KwaZulu Nature Conservation Act No.29 of 1992 and the Republic of South Africa Forest Act No.122 of 1984.

The legislative enactment governing the former Natal Parks Board, and under which the then Administrator of Natal proclaimed nature reserves in the province, was the Nature Conservation Ordinance No.15 of 1974. The proclamation of protected areas in KwaZulu-Natal by the Minister is now enabled by the KwaZulu-Natal Nature Conservation Management Act. The responsibility for the establishment of state forest reserves, in terms of the Forest Act No.122 of 1984, was assigned to the respective national ministers. These powers have subsequently been devolved to the Provinces, and the control and management of areas proclaimed under the Forest Act now rests with the KwaZulu-Natal Nature Conservation Service.

The Natal Parks Board was until recently, and for a period of 50 years, responsible for the management of the Park. The Natal Parks Board amalgamated with the former KwaZulu Department of Nature Conservation to form a new organization, the

KwaZulu-Natal Nature Conservation Board and Service, that is now responsible for the management of the Park. The former Natal Parks Board was constituted under the Nature Conservation Ordinance (Natal) No.15 of 1974. The following component areas of the Park were originally proclaimed in terms of this ordinance, and have now been incorporated under the new KwaZulu-Natal Nature Conservation Management Act:

- False Bay Park
- Mkuzi Game Reserve
- Sodwana Bay National Park
- St Lucia Game Reserve
- St Lucia Park

The following component areas were set aside under the Government of South Africa, Forest Act No.122 of 1984, as amended:

- Cape Vidal State Forest
- Dukuduku State Forest
- Eastern Shores State Forest
- Mapelane Nature Reserve
- Nyalazi State Forest
- Sodwana State Forest

The Park enjoys full legal protection under the provisions of the KwaZulu-Natal Nature Conservation Management Act No.9 of 1997, the Natal Nature Conservation Ordinance No.15 of 1974, the Forest Act No.122 of 1984 and the Sea Shore Act No.21 of 1935. Provisions within the Water Act No.54 of 1956 as amended and the Environment Conservation Act No.73 of 1989 as amended, also ensure the protection of certain natural resources. Management of the area is currently exercised at the provincial level by the KwaZulu-Natal Nature Conservation Service. The annual budget is allocated by the KwaZulu-Natal Provincial Legislature. The responsible officer who is accountable to the Minister of Traditional and Environmental Affairs is the Acting Chief Executive Officer, Dr G R Hughes who is empowered to take the day to day decisions, which he does in consultation with his executive staff representing three Branches, namely Conservation (with four sub-directorates), Scientific Services (with three sub-directorates), and Administration (with three sub-directorates). All major decisions, including those of policy, are taken by the KwaZulu-Natal Nature Conservation Board. This Board is the successor in title to the

In addition to the primary conservation functions, staff are also employed to undertake support functions such as construction, planning, public relations, secretarial services, accounting and accommodation bookings.

The following management plans have been compiled by the KwaZulu-Natal Nature Conservation Service: Master Plan for the Greater St Lucia Wetland Park, Mkuzi Game Reserve Management Plan, and St Lucia Marine Reserve Management Plan. In addition, management plans for seven other component areas of the Park are in preparation.

Several initiatives have been undertaken to rehabilitate areas that were under plantations or invaded by alien plant species and thus also re-establish the natural hydrological regime. These programmes are:

23.1 Removal of Plantations

The programme for the removal of plantations of exotic trees from the Eastern Shores is ahead of schedule with more than 30% of the 5 000 ha having been removed and rehabilitated. The programme is expected to have been completed within the next 10-15 years.

23.2 Working for Water Programme

This is a nationally funded programme by the Department of Water Affairs and Forestry for the removal of alien plant infestations from important water producing catchment areas in South Africa. The programme was initiated in the St Lucia region in late 1995. It is managed by the KwaZulu-Natal Nature Conservation Service on the Eastern Shores where more than 11 000 ha of conservation land has been cleared of self-seeded alien trees and plants including follow-up treatments of areas previously under plantations. The programme is to be expanded into other areas of the Park including the Mkuzi Game Reserve section. The South African Forestry Company (SAFCOL) are undertaking the programme on the western shores and have removed infestations of alien trees from the banks of rivers feeding the lake such as the Mpati.

23.3 Allocation of water for Lake St Lucia

Several technical workshops under the auspices of the KwaZulu-Natal Nature Conservation Service, Department of Water Affairs and Forestry and the Department of Environmental Affairs and Tourism have been held to model the fresh water requirements from the catchment for Lake St Lucia given demands for water from other users.

24. CONSERVATION MEASURES PROPOSED BUT NOT YET IMPLEMENTED

The KwaZulu-Natal provincial authorities are in the process of compiling a regional structure plan which would provide a development framework and policy guidelines for the control of development in the region in which the site is situated. This region is largely under-developed, being relatively densely populated by a majority of poor people. Unemployment levels are therefore high. The plan aims at an appropriate mix of land uses to accommodate both environmental concerns as well as development needs. Ecotourism is recognised as one of the more attractive development options, because of an anticipated escalation in the growth of the ecotourism market, and because of the sustainable nature of nature conservation as an appropriate land use in sensitive natural environments. Ecotourism and nature conservation are seen to be a labour intensive industry with the potential to provide employment and other benefits to neighbouring impoverished rural communities. In this and other respects, it is expected that support for upholding the integrity of the area will be provided by this plan.

In addition to the structure planning initiative, the KwaZulu-Natal provincial government is undertaking a multi-stakeholder planning initiative for the Richards Bay-Maputo corridor area known as the Lubombo Spatial Development Initiative (Lubombo SDI). Planning will promote the further development of agriculture and tourism in this area. The St Lucia region has been identified as a core node where anchor tourism development projects can be located. Such projects are of critical importance for the generation of employment, the local economy, and social upliftment of rural people as part of a strategy to alleviate poverty in the region and conserve the natural resource base. Tourism development is therefore largely based on protected areas that are either State, private and communally owned.

To ensure that decisions regarding land-use planning are complementary and environmentally sustainable, an integrated planning and development process

convened by the Nature Conservation Service is currently being undertaken. The process enables various sectors and stakeholders to work towards the common goal of eradicating the region's poverty and promoting sustainable development. These initiatives are being undertaken with communities in the Khula (Dukuduku area), False Bay, and Mkuzi areas to create community conservation areas. In addition the KwaZulu-Natal Nature Conservation Service is in the process of establishing local conservation Boards which will have decision-making and advisory functions regarding the Park.

25. CURRENT SCIENTIFIC RESEARCH AND FACILITIES

Key components of both the physical and biotic environment of the Park are monitored in order to determine the ecological state of the natural systems and to determine trends and changes over time. In terms of monitoring of climate, daily records of rainfall, maximum and minimum temperatures, and evaporation (Symonds pan) are made at all major stations except for the monitoring of evaporation which is done at Charter's Creek. Continuous records of wind and sea temperatures (Oceanographic Research Institute) are made. Unusual climatic events are recorded and rainfall records analysed to determine deviation from mean rainfall. Evaporation data is used together with rainfall and lake level records in order to explain hydrological responses in Lake St Lucia. Continuous record of water level in Lake St Lucia is measured at several localities and is a key determinant of the lake ecosystem especially for wading birds. Salinity (ppt) of the water in Lake St Lucia is measured monthly at several points and is possibly the single most important determinant of the state of the lake ecosystem, that is, with salinity, lake level, season, and the period of time since the last Are-setting@ it is possible to make predictions and assumptions on the biological state of the lake ecosystem. Changes in the state of the St Lucia estuary mouth are recorded, and this together with the above information as well as river run-off data is synthesised in the St Lucia hydrological model. Cross-section measurements of Lake St Lucia are undertaken by the Department of Water Affairs and Forestry every five years in order to detect rates of sediment accumulation and changes in volume.

With regard to the monitoring of the biota in Lake St Lucia, qualitative records are made on aquatic vegetation, and notes on the abundance of jellyfish, a key-stone species, are made. Fish are monitored once every three months at three sites using

nets of two mesh sizes. A total count, numbers of different species and the distribution of birds on Lake St Lucia is done every three months. Numbers of crocodiles and hippopotamus and their distribution are also recorded. In addition nesting success for colonial breeding birds and the number of crocodile and turtle nests are recorded. Within terrestrial areas annual game censuses are undertaken, species and cause of mortality recorded, as well as the number of sightings of rare species. The numbers of any animal species re-introduced to an area is recorded. Vegetation is monitored using fixed-point photography, and the annual mapping of areas burnt is undertaken.

Monitoring of consumptive use of natural products is undertaken. Areas and the amount in kilograms are estimated and recorded for off-take of reeds (including ncema) and grass at harvest time. All angler catches are monitored using a catch card return system and the full catch of fish caught by gill netting is recorded daily. This has provided information on catch per unit effort as well as identifying the species being targeted.

In terms of management actions undertaken by staff in the various component areas of the Park, several activities are monitored, including the areas, species and treatments of alien plant infestations, the areas and sites of soil erosion reclamation, the species and numbers of animals removed or culled as part of population control programmes, as well as the species and numbers of animal poached.

Staff within each component area of the Park are required annually to review the management programmes (including research and monitoring programmes) which stem from the protected area management plans that were undertaken during the previous reporting year and formulate their programmes for the current year. Management goals are set and reported on in the following year. These programmes are tailored according to resource (budgets, staff, and time) availability. A detailed annual report is compiled for each component protected area which collectively forms a document called the yearbook. The yearbooks are used for compiling the annual report of the KwaZulu-Natal Conservation Service which is submitted to the Minister and members of the provincial legislature.

The results of monitoring and reporting are contained in a series of yearbooks for the

respective past financial years. These are housed in the library at the headquarters in Pietermaritzburg and at stations in the KwaZulu-Natal Nature Conservation Service. The results are used to up-date management plans, formulate future management programmes or actions as well as monitoring and/ or research programmes.

Research facilities are provided in the town of St Lucia Estuary where there are offices, herbarium, library, and laboratory. In addition various research and conservation planning projects are undertaken at the head office in Pietermaritzburg where facilities have also been provided.

26. CURRENT CONSERVATION EDUCATION

An education centre has been established at St Lucia which is made available to schools and other groups. Displays and interpretation have been provided for visitors at several sites including the Crocodile Breeding Centre at St Lucia. A wide range of pamphlets and booklets are available on St Lucia and its environs.

27. CURRENT RECREATION AND TOURISM

There are ten entrance gates to the Park. Members of the public enter either as day visitors, or as overnight visitors who make use of accommodation or camping facilities. The Park can currently accommodate 5 736 persons per night. In addition almost 2 000 beds are provided by private enterprise in St Lucia Estuary village, and on privately owned game-ranches adjacent to the Park. It is estimated that approximately one million visitors enter the Park each year.

Access to the recreational opportunities of the Park via wilderness trails and guided walks, vehicle and boat tours is provided. Access to and diving on the coral reefs is controlled via diving concessionaires. Visitors also use a network of roads for game-viewing from their private vehicles.

The non-consumptive use of the area is encouraged. Activities permitted are:

- C game-viewing, bird-watching and turtle viewing, from vehicles and boats, with or without guides;
- C beach leisure activities (e.g. swimming, snorkelling, scuba-diving, walking, driving);
- C day-walks and overnight hiking;

- C camping, caravanning, and accommodation in chalets and bush-camps;
- C religious activities (e.g. mass baptism).

28. JURISDICTION

The Greater St Lucia Wetland Park and thus including the St Lucia System site, is under the jurisdiction of the KwaZulu-Natal Nature Conservation Board which was appointed by the provincial Minister of Traditional and Environmental Affairs in terms of the KwaZulu-Natal Nature Conservation Management Act No.9 of 1997.

29. MANAGEMENT AUTHORITY

The St Lucia System site is managed by the:

KwaZulu-Natal Nature Conservation Service
P O Box 662
Pietermaritzburg 3200
South Africa

30. BIBLIOGRAPHICAL REFERENCES

See attached list.

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