World Heritage Sites

Protected Areas and World Heritage

iSIMANGALISO WETLAND PARK
SOUTH AFRICA

The Park is one of the outstanding natural wetland and coastal sites of Africa. It lies on a tropical-subtropical interface with a wide range of pristine terrestrial, wetland, estuarine, coastal and marine environments, which are scenically beautiful and basically unmodified by people. They include coral reefs, long sandy beaches, coastal dunes, lake systems, swamps, and extensive reed and papyrus wetlands. These provide critical habitat for a wide range of species from Africa's seas, wetlands and savannahs. The interaction of these environments with major floods and coastal storm in the Park's transitional location has resulted in continuing speciation and exceptional species diversity. Its vivid natural spectacles include nesting turtles and large aggregations of flamingos and crocodiles.

COUNTRY
South Africa

NAME
iSimangaliso Wetland Park

NATURAL WORLD HERITAGE SERIAL SITE
1999: Inscribed on the World Heritage List under Natural Criteria vii, ix and x.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE
The UNESCO World Heritage Committee adopted the following Statement of Outstanding Universal Value at the time of inscription

Brief Synthesis
The iSimangaliso Wetland Park is one of the outstanding natural wetland and coastal sites of Africa. Covering an area of 239,566 ha, it includes a wide range of pristine marine, coastal, wetland, estuarine, and terrestrial environments which are scenically beautiful and basically unmodified by people. These include coral reefs, long sandy beaches, coastal dunes, lake systems, swamps, and extensive reed and papyrus wetlands, providing critical habitat for a wide range of species from Africa's seas, wetlands and savannahs. The interaction of these environments with major floods and coastal storms in the Park's transitional location has resulted in continuing speciation and exceptional species diversity. Its vivid natural spectacles include nesting turtles and large aggregations of flamingos and other waterfowl.

Criterion (vii): iSimangaliso is geographically diverse with superlative scenic vistas along its 220 km coast. From the clear waters of the Indian Ocean, wide undeveloped sandy beaches, a forested dune cordon and a mosaic of wetlands, grasslands, forests, lakes and savannah, the park contains exceptional aesthetic qualities. Three natural phenomena are judged outstanding. One is the shifting salinity states within Lake St. Lucia which are linked to wet and dry climatic cycles, with the lake responding accordingly with shifts from low to hyper-saline states. A second is the spectacle of large numbers of nesting turtles on the beaches and the abundance of dolphins and migration of whales and whale sharks off-shore. Finally, the huge numbers of waterfowl and large breeding colonies of pelicans, storks, herons and terns are impressive and add life to the wild natural landscape of the area.

Criterion (ix): The combination of fluvial, marine and aeolian processes initiated in the early Pleistocene in iSimangaliso has resulted in a variety of landforms and continues to the present day. The Park's transitional geographic location between sub-tropical and tropical Africa as well as the coastal setting have resulted in exceptional species diversity. Past speciation events in the Maputaland Centre of Endemism are also ongoing and contribute another element to the diversity and interplay of evolutionary processes at work in iSimangaliso. In the marine component of the site, the sediments being transported by the Agulhas current are trapped by submarine canyons on the continental shelf allowing for remarkably clear waters for the development of coral reefs. The interplay of this environmental heterogeneity is further complicated by major floods and coastal storms,

events which are regularly experienced in iSimangaliso. The site is also of sufficient size and retains most of the key elements that are essential for long-term functioning of the ecosystems.

Criterion (x): The five interlinked ecosystems found in iSimangaliso provide habitat for a significant diversity of African biota, including a large number of threatened and/or endemic species. The species lists for iSimangaliso are the lengthiest in the region and population sizes for most of them are viable. Of the over 6,500 plant and animal (including 521 bird) species recorded from the Park, populations of species of conservation importance include 11 species endemic to the park, 108 species endemic to South Africa, while 467 species are listed as threatened in South Africa. The outstanding diversity of habitats (terrestrial, wetland, coastal and aquatic) supports a wide variety of animal species, some at the northern and many at the southern limit of their range.

Integrity

The property consists of 13 separate but contiguous conservation units totalling 239,566 ha including some 85,000 ha of marine reserves. Its history of conservation management dates back to 1895 when the first reserves were created by the Zululand Government, and later proposals for titanium sand mining were rejected. Ongoing integrity issues include the protection of catchment area and regional development (upstream water abstraction, agricultural practices and road construction); land claims (which may result in further boundary issues); resource harvesting and local community issues; and restoration of degraded habitats. A unified management system for all 13 components was also requested.

The park is not inhabited by people apart from six small townships in the Kosi Bay Coastal Forest Reserve (insert current number of inhabitants). There are also two villages (Makakatana and St Lucia Estuary) which are enclaves within the Park but not part of it. About 100,000 people from 48 tribal groups live in villages surrounding the Park and community conservation programmes are key to minimising conflicts and maximising benefits. A progressive neighbour-relations policy fosters good relations with communities who live near the Park to ensure that they derive direct benefits from the protected area such as free access, business and employment.

Protection and Management Requirements

Management of the Park at the provincial level is by the KwaZulu-Natal Nature Conservation Service working with the provincial administration in accordance with national and provincial legislation. South Africa has solid legislation that affords iSimangaliso the necessary legal protection, such as the World Heritage Convention Act, 1999. iSimangaliso contains four Ramsar sites [St. Lucia Lake System (Ramsar Site # 345) (ii) Turtle Beaches/Coral Reefs of Tongaland (Ramsar Site # 344) (iii) Kosi Bay Lake System (Ramsar Site #527), and (iv) Lake Sibaya (Ramsar Site # 528)] that recognise the ecological functions of wetlands as well as their importance as resources of economic, cultural, scientific and recreational value. All human uses of iSimangaliso are subject to intensive management, research and monitoring. They are also confined to about a third of the total area while the remainder is free from extractive uses. Some funds to assist in community conservation have come from WWF, but the main funding to ensure that iSimangaliso management is adequately supported comes from the Province.

A major threat to the Park is damage to the hydrology and salinity of the wetland system including reduction in the water supply by the transformation of the upper Mfolozi Swamps by agriculture. Serious droughts have raised salinity and killed off shoreline vegetation, causing bank erosion and silting of the lake. The Umfolozi River has also threatened to break into the lake, again raising the likelihood of sedimentation and invasion by sand and sea-water following breaching of the sand bar. Catastrophic events such as the grounding of an oil tanker near the park in 2002 also threaten the site. Other threats include damage by over-use (tourism and over-exploitation of resources such as unsustainable fishing).

The park has high visitation rates and has been zoned into three ecotourism use-zones: a zone of low intensity use in the wilderness core of the Park where access is by foot except for staff; a moderate use zone where visitors can view wildlife from vehicles and from scattered camps and hides; and high intensity use zones where, at seven development nodes, there are roads, interpretative and educational displays, guided walks, accommodation and other facilities.

Infestation by alien invasive plants is a problem, although limited in area at present. The worst invaders are Chromolaena odorata, Psidium guajava, Pereckia acuelata and Melia azedarach. Programmes by the Plant Protection Research Institute have used biological control, especially to remove plant infestations from important water-producing catchment areas. In addition pine and eucalyptus plantations around the lake have been removed to improve water seepage.

In the past several land claims by impoverished communities have been lodged before the Land Claims Court. These areas include the Eastern Shores State Forest, Cape Vidal State Forest and Sodwana State Forest. One solution has been reached with the Mbuyazi whose rights near Cape Vidal have been recognised, not to settle, but to develop ancestral lands for tourism. More recently, there has been conflict over other large hotel developments launched in environmentally sensitive areas without contact with local stakeholders, environmental impact assessments or adequate infrastructure. However by 2004 it was stated that the land claimants and local communities were accepted as partners in the development of the Park.

INTERNATIONAL DESIGNATIONS

Four sites designated Ramsar Wetlands of International Importance. Total area: 213,732 ha:

1986:	St Lucia System	155,500ha
	Turtle beaches/Coral reefs of Tongaland	39,500ha
1991:	Kosi Bay	10,982ha
	Lake Sibaya	7,750ha

IUCN MANAGEMENT CATEGORY

II National Park

BIOGEOGRAPHICAL PROVINCE

South African Woodland/Savanna (3.8.4).

GEOGRAPHICAL LOCATION

The Park is on the east coast of South Africa 160 km north of Durban in northern KwaZulu-Natal Province. It runs north almost 220 km to the Mozambique border, 1 km to 24 km wide, with a parallel 155 km by 5 km marine component. It is located between 32° 06'25''E to 32° 56'46''E and 26° 51'26''S to 28° 29'07''S.

DATES AND HISTORY OF ESTABLISHMENT

1897: Lake St. Lucia designated a Game Reserve. The Park has legal protection under the following acts: Sea-Shore Act 21 of 1935; Water Act 54 of 1956;

1974: Natal Nature Conservation Ordinance 15, (covering the National Park, St Lucia Game Reserve and St. Lucia Park, False Bay Park, Sodwana Bay);

1984: Forest Act 122 (covering Cape Vidal State Forest, Eastern Shores State Forest, Maphelane Nature Reserve, Nyalazi State Forest and Sodwana State Forest);

1986: Ramsar Wetlands designated: the St Lucia System, Tongaland turtle beaches and coral reefs;

1988: Sea Fishery Act 12 (covering St Lucia Marine Reserve and Maputaland Marine Reserve);

1990-1996: Added to Montreux record of wetlands in danger;
Environment Conservation Act 73 passed;

1992: Kwazulu Nature Conservation Act 29 (the Coastal Forest Lake Sibayi Reserves);

1997: KwaZulu-Natal Nature Conservation Management Act 9;

1991: Ramsar Wetlands designated: Lake Sibayi and Kosi Bay;

1999: Greater St.Lucia Wetland Park established;

2008: Renamed iSimangaliso Wetland Park (UNESCO, 2008).

LAND TENURE

Province of KwaZulu-Natal. Administered by the KwaZulu-Natal Nature Conservation Service (KNNCS).

AREAS

The total area of these 13 protected areas is 239,566 ha, including the marine areas (84,020 ha). The areas are as given in the KwaZulu-Natal Nature Conservation Service Nomination document of 1998.

Sodwana State Forest	47,127 ha	False Bay Park (Seal Island)	2,247 ha
St Lucia Game Reserve	36,826 ha	Nyalazi State Forest	1,367 ha
Kosi Bay/Coastal Forest Reserve	21,772 ha	Sodwana Bay National Park	1,155 ha
Eastern Shores State Forest	12,873 ha	Maphelane Nature Reserve	1,103 ha
Cape Vidal State Forest	11,313 ha		
St Lucia Park	12,545 ha	St Lucia Marine Reserve	44,280 ha
Lake Sibayi Freshwater Reserve	7,218 ha	Maputaland Marine Protected Area	39,740 ha

ALTITUDE

Below sea level to 172m in the Ntambama and ~170m in the Maphelane dunes.

PHYSICAL FEATURES

The Park comprises two geomorphic units: coastal plain and continental shelf. The coastal plain is the southernmost end of the Mozambique coastal plain. It encloses the lagoon-like lakes of one of the major estuarine systems of Africa. These are separated from the sea by high forested barrier dunes of wind-blown sand. To its north-west are the low Lubombo mountains in the adjacent Mkusi Game Reserve. The surficial geology within the site is a complex of terrestrial and marine sediments. The upper Cretacean St Lucia formation exposed on the west coasts of False Bay and Lake St Lucia is very rich in marine fossils of more than a hundred different species, including giant ammonites and inoceramids. Stratified Quaternary marine deposits related to marine transgression and regression have resulted in a series of prominent north-south oriented sandy dune ridges (Watkeys *et al.*, 1993). The soils are largely infertile wind-redistributed grey and red sands over mudstone and clay pans. Riverbanks are alluvial; swamps have gley soils.

The coastal dunes along the eastern edge of the coastal plain are unique for the height, variety and extent of their forest cover. Along the intertidal and infratidal coast, the coastline has long sandy beaches between reefs of beach rock. The dunes were formed over the past 25,000 years, and consist of superimposed sedimentary strata of different ages (Davies Lynn & Partners, 1992). They range between 50 and 170 meters high, the highest mapped being the Ntambama dune (172m). They contain good deposits of mineral ores.

Two types of coastal lake systems have formed behind the coastal dunes: estuarine (Lake St Lucia and Lake Kosi) and freshwater (Lake Sibayi and the smaller Lake Bhangazi North, Lake Bhangazi South and Lake Mgobezeleni). The St. Lucia estuary covers about 32,000 ha, is 3 to 18 km wide by 50 km long, varying with inflow, and is connected with the sea through a 15 km channel. The depth of the water averages less than a meter and has consistently become shallower during the past century. It is predominantly saline: the uppermost section and the mouths of the feeder rivers are only fresh water when inputs are high. Dry season evaporation is high and causes the inner reaches of the lake to become hypersaline. The variability makes it vulnerable to drought but the biota adjusts to the fluctuations in salinity. Lake Sibayi is the largest freshwater lake in South Africa, a drowned valley fed mainly by seepage, adjoining a rich dune forest. Lake Kosi is a relatively pristine complex of four tidal lakes, estuary, sedge-beds and swamps fed by two main rivers. It is rich in aquatic life but vulnerable to nutrient enrichment from inland.

Lake St Lucia is supplied by five rivers, the catchments of which lie outside the boundaries of the Park. North to south these are the Mkuse, Mzizene, Hluhluwe, Nyalazi and Mpate. The Mfolozi and Msunduze rivers in the south enter the sea together close to the mouth of Lake St Lucia. The largest rivers, the Mkuze and Mfolozi, have little of their alluvial lower reaches in the Park. The rivers are seasonal, flowing during the wet summer months and reduced to isolated pools and seepage through bed sediments in winter. High sediment loads from the Mkusi river which drains the Lubombo mountains fill its mouth forming meandering distributaries, levees and pans with swamp and riverine forest. As a result, the waters of Lake St Lucia are turbid.

The narrow, 2 to 4 km wide continental shelf is protected by reserves further north and, being warmed by the silt-free Agulhas current, has the southernmost coral reefs on the east African coast - almost the only reefs in South Africa. These parallel the coast for 155 km south from the Mozambique border at 8 to 35m deep. Seven submarine canyons formed by palaeo-river outlets capture the silt brought by the Agulhas current and permit deep oceanic water and biota associated with it to reach near the shore (Ramsey, 1991).

CLIMATE

The area lies between tropical and subtropical zones having warm, moist summers and mild dry winters. The Agulhas current warms the coast. The mean annual temperature exceeds 21°C. There is an east-west climatic gradient with the coast being moist with high precipitation and the inland area being moderately dry. Rainfall in the Park is temporally and spatially highly variable. At the coast it varies from 1200 to 1300mm per annum with 60% of the rain falling in summer (November to March). Evaporation rates are high and there is occasional large-scale flooding. The prevailing winds parallel the coast from the south.

VEGETATION

The Park, lying on the interface between tropical and sub-tropical biota with varied geomorphic and climatic conditions, supports an exceptional ecological and biological diversity, especially of wetlands.

The distribution of the vegetation is largely determined by topography, moisture regimes and edaphic conditions. The system is almost pristine and still functions well. It is a rich mosaic of savanna grassland, thickets and woodlands; grasslands: low-lying, hygrophilous and floodplain; sedge swamps, freshwater reed and papyrus swamps; riverine woodlands, swamp forests and forested dunes; the lake with its uniquely variable salinity regime; underwater macrophyte beds, saline reed swamps, saltmarshes and mangroves; sandy and rocky shores, coral reefs and submarine canyons.

The Park is at the southernmost end of the Maputaland Centre of Endemism (van Wyk, 1993) which extends from the Limpopo to the St Lucia estuaries, east of the Lubombo mountains. It is one of two foci of high endemism in the Tongaland-Pondoland Regional Mosaic described by White (1983). The flora is diverse, having 152 families, 734 genera and 2,173 species. 98% of Maputaland Centre species, approximately 9% of the flora of South Africa and 31% of the flora of KwaZulu-Natal, have been recorded in the Park (Scott-Shaw, 1994). 32 species are listed in the South Africa Red Data Book for Plants and 8 species are contained in CITES appendices. 6 species are endemic to KwaZulu-Natal and 3 species are known only from the Park.

In the Maputaland Centre at least 168 species and subspecies are considered endemic or near-endemic (van Wyk, 1993). Of these, 44 (27%) are found in the Park. The following species are of phytogeographic interest: *Helichrysopsis septentrionale* (Maputaland endemic), four regional endemic genera (*Brachychloa, Ephippiocarpa, Helichrysopsis* and *Inhambanella*), *Restio zuluensis*, an endemic, *Wolffiella welwitschii,* a recently discovered endemic, the smallest flowering plant in southern Africa and *Thalassodendron ciliatum*, the only marine flowering plant found on the south African coastline. A new small grassland aloe with affinities to *Aloe parviflora* awaits description. It is endemic to the Park and confined to the Eastern Shores area. *Kalanchoe luciae lucia*, described recently, and *Rhus kwazuluana*, are also endemic to the Park. 136 species are at their southern limit and there are some notable disjunct distributions.

The Mkusi River swamps are diverse and undisturbed with a forest of *Ficus, Voacanga, Ilex, Uera* and *Syzygium* species. The wetlands of the estuarine system include freshwater *Phragmites australis* - *Cyperus papyrus* swamp which covers approximately 7,000 ha in the Park, forming the largest protected wetland in South Africa; saline reed swamp on alluvium and islands in Lake St Lucia, dominated by *Phragmites mauritianus;* sedge swamp, mainly in the Mfabeni swamp, characterised by *Eleocharis limosa;* salt marsh dominated by *Sporobolus virginicus* and *Paspalum vaginatum* with *Juncus kraussii* (*ncema*, commercially used by local people), and nutrient-rich submerged macrophyte beds on saline lake-bed soils. Aquatic vegetation such as the pondweed *Potamogiton pectinatus* develops in the lake after it has been low for a long period, which supports much birdlife. Grassland types include hydrophilous grassland on sandy riverine soils dominated by *Acroceras macrum* and *Ischaemum arcuatum*; high-lying grasslands on sand - a fire-subclimax community, palm-veld with *Hyphaene coriacea* and *Phoenix reclinata*, also a fire-subclimax community; *Echinochloa* floodplain grassland; and low-lying grasslands on clay.

Open woodlands include mixed Acacia/broad-leaved woodland of *Hyphaene coriacea* and *Ziziphus mucronata* and mixed Acacia woodland of *Acacia nigrescens, A.gerrardii, A.tortilis, A.nilotica,* which provide grazing and browsing for herbivores. Closed woodlands are found on low-lying drainage lines and older alluvial soils, especially along the Mkuze and Msunduzi rivers. They include riverine *Ficus sycomorus* and *Acacia xanthophloea*; mixed Acacia closed woodland of *A.tortilis* and *A.nilotica;* broad-leaved woodland of *Combretum molle* and *Zizphus mucronata,* and *Terminalia sericea-Strychnos* woodland and scrub. Thickets of mixed microphyllous and broad-leaved woodland subject to salt spray and wind occur on seaward-facing dune slopes with *Eugenia, Brachylaena, Euclea, Diosporos* and *Mimusops* species.

Forest types include swamp forest, rare in South Africa, covering 3,095ha (64% of the South African total) dominated by *Ficus tricopoda,* hygrophilous forest and *Barringtonia racemosa* forest. These occur on organic soils in hypo-saline drainage lines and marshes around freshwater lakes usually flooded with slow-flowing water after rains; mangroves, dominated by *Bruguieria gymnorrhiza* and *Avicennia marina;* the uniquely well developed coastal dune forest of *Mimusops caffra, Grewia occidentalis* and *Psychotria capensis* which can reach 30m high and has a dense shrub layer with many lianas; sand forest on relict dunes of highly-leached sands with *Newtonia hildebrandtii* and *Cleistanthus schlechteri;* and coastal lowland forest growing to 30m high on highly leached sands with *Strychnos decussata* and *S. gerrardii* with species of *Terminalia, Balanaites* and *Sclerocarpia,* also plantations of *Pinus elliottii*.

In the marine flora, 325 seaweeds have been recorded in the Park, nearly 78% of the total seaweeds of the Kwazulu-Natal coastline. A new species, *Cellophycus condominius*, and a parasitic red alga, *Calocopsis smithenae*, have recently been found; also beds of kelp *Ecklonia biruncinata,* deep in submarine canyons.

FAUNA

The outstanding diversity of habitats, terrestrial, wetland, coastal and aquatic, supports a wide variety of animal species, some at the northern and many at the southern limit of their range. The fringing coral reefs are among the southernmost in the world. The lakes, swamps and shallows comprise the most productive estuarine prawn nursery and marine nursery of the South African coast.

There are 97 species of terrestrial mammals in the Park including the internationally threatened (reintroduced) south-central black rhinoceros *Diceros bicornis minor* (CR: 13 in the Eastern Shores with 95 in the adjoining Mkusi Game Reserve), and 150 southern white rhinoceros *Ceratotherium simum simum*. The Park has the largest single populations in South Africa of hippopotamus *Hippopotamus amphibius* (VU*:* about 700), the endemic Natal red duiker *Cephalophus natalensis natalensis* and southern reedbuck *Redunca arudinum*. It also has the largest publicly protected populations in KwaZulu-Natal of the endemic Tonga red bush squirrel *Paraxerus palliatus tongensis*, greater cane rat *Thryonomys swinderianus* and four-toed elephant shrew *Petrodromus tetradactylus,* thicktailed bushbaby *Otolemur crassicaudatus*, Stairs' white-collared monkey C*ercopithecus mitis erythrarcus* (VU), sidestriped jackal *Canis adustus*, banded mongoose *Mungus mungo*, brown hyaena, *Hyaena brunnea* and bushbuck *Tragelaphus scriptus*, The cheetah *Acinonyx jubatus* (VU) was reintroduced in 2003 and the African wild dog *Lycaon pictus* (EN) was reintroduced to neighboring Mkuzi Reserve in 2005.

The Park is also the only protected area in KwaZulu-Natal known to have populations of nine species of bat: Eygptian fruit *Rousettus aegyptiacus,* Geoffroy's horseshoe *Rhinolophus clivosus*, Percival's trident *Cloeotis percivali* (VU), butterfly *Glauconycteris variegatus*, Schlieffen's *Nycticeinops schlieffeni*, lesser woolly *Kerivoula lanosa,* Ansorge's freetailed *Tadarida ansorgei*, Angolan freetailed *T. condylura* and the hairy slitfaced bat *Nycteris hispida*, the last being endemic to South Africa. There are also two shrews, the lesser red musk shrew *Crocidura hirta* and greater dwarf shrew *Suncus lixus*, and two gerbils, bushveld *Gerbilliscus leucogaster* and highveld *G. brantsii*. The Park also contains populations of two other species endemic to South Africa: Hottentot golden mole *Amblysomus hottentotus* and Natal red rock hare *Pronolagus crassicaudatus*.

All 32 marine mammal species are both internationally threatened and listed in CITES appendices. Populations of dolphins: common bottlenose and Indo-Pacific bottlenose *Tursiops truncates* and *T. aduncus*, humpback and Indo-Pacific humpback *Sousa plumbea* and *S. chinensis* and spinner *Stenella longirostris* live in the waters of the Park. Winter migrations of humpback whale *Megaptera novaeangliae* and southern right whale *Eubalaena australis* are seen (Hoyt, 2005).

Terrestrial invertebrates in the Park are known to be numerous and diverse, supporting much of the conspicuous fauna. There are 196 species of butterflies (49% of Kwazulu-Natal species), 52 species of dragonflies (23% of South African species), 139 species of dung-beetles, 27 species of hole-nesting wasps, 64 species of biting flies (64% of South African tabanids), 58 species of chafer beetles (cetonids) and 41 species of land snails.

The herpetofauna is rich: 50 amphibians and 109 reptiles: one crocodile, 12 species of *Chelonidae*, 53 snakes and 42 lizards and chameleons. Populations of 5 amphibians are endemic to KwaZulu-Natal, 2 being nationally threatened, also 6 internationally and 20 nationally threatened reptile species; 16 being listed in CITES appendices. They include Bouton's coral rag skink *Cryptoblepharus boutoni africanus*, found only here in South Africa. The Mozambique shovelsnout snake *Prosymna janii* and three South African endemics: two burrowing skinks, the striped *Stelotes vestigifer* and Fitzsimon's *S. fitzsimonsi* and Setaro's dwarf chameleon *Bradypodion setaroi* are found only in the coastal dune system. The Park is the main South African breeding ground for loggerhead *Caretta caretta* (EN), and leatherback turtles *Dermochelys coriacea* (CR)*,* with estimated populations of 2500 and 750 females respectively. Non-breeding green turtles *Chelonia mydas* (EN) are also resident and hawksbill *Eretmochelys imbricata* (CR) and olive ridley *Lepidochelys olivacea* (VU) turtles visit the coast. The population of Nile crocodiles *Crocodylus niloticus* of approximately 1,500 animals over 2m long is one of the largest in Africa,

Marine and estuarine invertebrates are the most important group of aquatic invertebrates. The coral reefs of the Park occur in the protected Kosi reefs (Northern Complex), the public Sodwana Bay reefs (Central Complex) and the protected Southern Complex which is threatened by dredging in the estuary. They include 129 species of coral and are particularly important for their conservation and scientific value. Recorded within the Park are 43 scleractinian (hard coral) and 10 alcyonacean (soft coral) genera, 14 sponges, 4 tunicates, 812 species of marine and estuarine molluscs (72% of Kwazulu-Natal coastal species), including the giant clams *Tricdaca maxima* and *T.squamosa,* and 198 species of Crustacea.

The ichthyofauna contains nearly 85% of the reef fish species endemic to the west Indian Ocean region (399 species), notably the coelacanth *Latimeria chalumnae* (CR), known from Devonian fossils 370 million years old but only discovered off South Africa in 1938. 2 specimens in 1991 and 3 specimens at Sodwana Bay in 2000 have been seen in the marine section of the Park (Venter *et al*., 2009). There are also several commercially important endemics such as the slinger seabream *Chrysoblephus puniceus*. 991 species have been recorded, including summer aggregations of ragged-toothed shark *Tiburon odontaspis* and whale shark *Rhinchodon typus* (VU). The 212 estuarine species include the bull shark *Carcharhinus leucas*. The fresh water fish fauna comprises 55 species including 6 internationally threatened and 16 nationally threatened species, including the St. Lucia mullet *Liza luciae* (EN) and, in Lake Sibaya, the endemic Sibaya goby *Silhouettea sibayi* (EN). The Park encloses the largest estuarine prawn nursery area in South Africa.

The very diverse avifauna numbers 521 species - 60% of the South African total, approximately 200 of which are water birds which the lakes attract in very large numbers. The 339 breeding species include 23 of the 97 migrants. There are four species endemic to South Africa and 47 endemic or nearly endemic to the region. The Park is an important breeding area for the pink-backed pelican *Pelecanus rufescens*, great white pelican *P. onocrotalus*, goliath heron *Ardea goliath*, rufous-bellied heron *Ardeola rufiventris,* yellow-billed stork *Mycteria ibis,* African pygmy goose *Nettapus auritus*, African fish-eagle *Haliaeetus vocifer*, collared pratincole *Glareola pratincola*, Caspian tern *Sterna caspia* and grey-rumped swallow *Pseudohirondo griseopyga*. The Park is also habitat for major South African populations of greater and lesser flamingo *Phoenicoepterus ruber*, and *P. minor*, saddle-billed stork *Ephippiorhyncus senegalensis,* African Spoonbill *Platalea alba,* southern banded snake-eagle *Circaetus fasciolatus*, black harrier *Circus maurus* (VU), osprey *Pandion haliaetus*, avocet *Recurvirostra avocetta,* Zululand batis *Batis fratrum*, Hottentot button-quail *Turnix hottentottus*, swamp nightjar *Caprimulgus natalensis*, lesser coucal *Centropus bengalensis,* mouse-colored sunbird *Nectarinia veroxii,* and short-tailed pipit *Anthus brachyurus.* The coastal forest holds the restricted range species Rudd's apalis *Apalis ruddi,* Neergaard's sunbird *Nectarinia neergaardi* and pink-throated twinspot *Hypargos margaritatus*; also the rare spotted ground-thrush *Zoothera guttata* (EN). The Park is one of the world's Endemic Bird Areas. 62 species are listed in the South African Red Data Book and 73 species are listed in CITES appendices.

CONSERVATION VALUE

The natural systems of the iSimangaliso Wetland Park are unique within southern Africa for their biophysical diversity and for the hydrological and ecological processes of Lake St Lucia with its fluctuating salinity and adapted biota. There are few comparable pristine protected coastlines on a tropical-subtropical interface. The diverse range of grassland, swamp, estuarine lake, coastal dune forest and marine environments are scenically beautiful and substantially unmodified by people The Park is not under serious threat and is large and diverse enough to survive as a natural area. Four Ramsar Wetland sites comprise 73% of its area. The coast also has extraordinary natural spectacles: nesting and hatching turtles, offshore whale migrations; 50,000-bird aggregations of feeding flamingos and impressive displays of other waterfowl, nesting sites of the Nile crocodile and large concentrations of ungulates. The turtle nesting beaches, black rhinoceros thickets, the species-rich dry sand forest and bush, the diverse mosaic of wetlands and the hundreds of well-preserved marine fossils of marine origin are of global importance. The Park lies within a Conservation International-designated Conservation Hotspot, a WWF Global 200 Marine Eco-region, a WWF/IUCN Centre of Plant Diversity and is in one of the world's Endemic Bird Areas. It also contains four Ramsar wetland sites.

CULTURAL HERITAGE

The first evidence of human occupation of the Park dates from the Early Stone Age. Three occupation sites of the Acheulian culture (between 500,000 and a million years B.P.) have been found in the Park (Avery, 1980). People of Middle and Late Stone Age cultures may have inhabited the Maputaland area

for probably as long as 110,000 years (Beaumont *et al.*, 1978). The Maputaland plain which includes the area of the Park was widely settled by agriculturists in the early and late Iron Ages (250-1840 AD), (Maggs, 1984). Shell middens on the coast testify to extensive use of black mussels *Perna perna* for food (Hall & Vogel, 1980). These early agriculturists probably occupied coastal sites as early as 1600 years ago, living and cutting fields in the forest.

Due to the prevalence of malaria and the cattle disease trypanosomiasis, carried by the tsetse fly *Glossina* spp., extensive areas of what is now the Park were uninhabited (Bruton *et al.*, 1980). Small scattered settlements of the Sokhulu people were present between Sodwana and the St Lucia estuary, evidenced by several traditional burial sites. These people smelted bog iron, felling trees to produce charcoal for their smelters. The effects of their agriculture and iron-smelting may have modified habitats by increasing sub-climax grassland in the place of forest, creating favourable habitat for grazing species (Taylor, 1980).

The name Saint Lucia was first applied by Portugese navigators in 1576 (Mountain, 1990). Little is known about the nature of human settlements until the early nineteenth century. Maputaland was then occupied from the north by two culturally distinct groups: Tembe-Thonga people in the north and Nguni-speaking people in the south (Bryant, 1929; Dominy, 1992). Both subsequently came under Zulu domination (Wright & Hamilton, 1989). A tribal wildlife sanctuary was established in the mid 19th century within the present adjacent Mkusi Game Reserve area. Concern about the destruction of wildlife after annexation in 1884 led to demarcation of game sanctuaries in 1895 and later. These are the oldest extant game reserves in Africa (Ellis, 1975) and are now part of the Park. There was a little settlement along the coast and in the 1950s the State Department of Forestry planted 10,000 ha of the Eastern Shores State Forest and 2,000 ha on the Western Shores, mainly of *Pinus elliottii* and species of eucalyptus. However, these were phased out in 1991 because of their low economic value.

LOCAL HUMAN POPULATION

This area adjoining the Mozambique border was malarial, isolated and poorly developed in the recent past. Until 1994 part of the area was used by the military. Except in the Coastal Forest Reserve the Park is not now inhabited. Within this, there are six small private townships (Enkovukeni, Kwa Dapha, Mqobella, Mbila, Shazibe, and Hlabezimhlophe) with a combined total population of approximately 200 families. There are also the private villages of Makakatana and St Lucia Estuary which are enclaves within the Park but are not part of it. Nearly 500 local people enter the Park for the limited use of natural products and there is a two-week grass and reed gathering period in June by some 1,500 people a day. A progressive neighbour-relations policy fosters good relations with communities who live near the Park to ensure that they derive direct benefits from the protected area such as free access, business and employment.

VISITORS AND VISITOR FACILITIES

As late as 2002 approximately one million visitors entered the Park each year from nine entrance points. The Park can accommodate 5,736 persons per night in chalets and camping facilities. 2,000 beds are also provided privately in St Lucia Estuary village and on privately owned game-ranches next to the Park. Visitor access is controlled and managed by the KwaZulu-Natal Nature Conservation Service or through concessions. Non-consumptive use of the area is encouraged: game-viewing, bird-watching, turtle viewing, caravanning, bush-camping, trail walking and overnight hiking; also religious activities (mass baptism). Recreational access is via wilderness trails, guided walks, vehicle and boat tours and a network of roads for viewing game. Access to and diving on the coral reefs is controlled through diving concessionaires and the Sodwana Bay reefs receive about 100,000 dive visits a year. The spectacular coasts of the Park are known for the night-time nesting and later hatching of leatherback and loggerhead turtles, passing whale migrations; aggregations of feeding flamingos and other waterfowl, the nesting sites of the Nile crocodile and large concentrations of ungulates.

The area is publicised as the Elephant Coast; and elephants are to be re-introduced. In 2003 a R432-million tourist development for the coast was proposed by the Ministry of Environmental Affairs and Tourism for 8 concessionaires to provide over 800 rooms in lodges, resorts and camps. Environmental impact statements were to be required (Anon, 2003). To control tourism there are three ecotourism use-zones: a zone of low intensity use in the wilderness core of the Park where access is by foot except for staff; a moderate use zone where visitors can view wildlife from vehicles and from scattered camps and hides; and high intensity use zones where, at seven development nodes, there are roads, interpretative and educational displays, guided walks, accommodation and other facilities. A crocodile breeding centre at St. Lucia is the interpretive centre for the region. Under a regional plan (the

Lubombo Spatial Development Initiative), the area's infrastructure is being improved and a regional airport is scheduled for Mkaze, 40 km west of the coast, in 2005. However, a recent national government ban on the use of 4WD vehicles in the coastal zone has seriously reduced the tourism on which the area now depends (Mail & Guardian Online, 2005).

SCIENTIFIC RESEARCH AND FACILITIES

There have been five major successful conservation programs in the Park: of the black rhinoceros, the hippopotamus, sea turtle beaches, crocodile breeding and the re-establishment of locally extinct species. The many well-preserved fossils of marine origin are studied for their evidence of the evolutionary history of the earth. There are also programs on the control of alien species, the management of ungulate populations, rehabilitation of clear-felled forest in the Eastern Shores and controlled fire management. All these programs benefit from research and monitoring. The research and monitoring records of the environment, biota, and Park management are extensive. Records are updated annually. They are in the form of several computerized databases, reports and publications and a geographical information system. Main facilities are located at St Lucia, the Pietermaritzburg head office, the Oceanographic Research Institute and elsewhere.

MANAGEMENT

Management of the Park at the provincial level is by the Board of the KwaZulu-Natal Nature Conservation Service (KNNCS) working with the provincial administration in accordance with national and provincial legislation. There is potential for future trans-frontier development with Mozambique and the establishment of buffer Biosphere Reserves to the west. Existing land uses in the region of the Park consist of formal and informal agriculture and forestry, nature conservation, mining and ecotourism, which is a significant industry. A strategy to provide a development framework and policy guidelines for the development of the region around the Park has been compiled by the provincial authorities. To counter threats to the hydrology of the wetland systems and from infestation by alien plants, three programs have been started: the removal of exotic tree plantations, the removal of alien plant infestations from important water-producing catchment areas (part of a nationally funded program), and the restoration of the natural hydrological regime.

The Kwazulu-Natal provincial government, with the governments of Mozambique and Swaziland, is undertaking a multi-stakeholder planning initiative for the Richards Bay-Maputo corridor area, known as the Lubombo Spatial Development Initiative, to protect catchments and promote further agriculture and tourism in the area. An integrated planning and development process is followed by the KNNCS, involving various stakeholders, to ensure that land-use planning decisions are complementary and sustainable. With funding from WWF South Africa, KNNCS has set up a community conservation programme for the whole Park to integrate conservation with development programs. The following management plans have been compiled by KNNCS: Master Plan for the Greater St Lucia Wetland Park, St Lucia Marine Reserve Management Plan and Mkuzi Game Reserve Management Plan. Management plans for seven other component areas are also in preparation: for False Bay, Western Shores, Lake and islands, Eastern Shores, Tewate Wilderness Area, Sodwana Bay and the Maputaland Marine Reserve. The 22,479 ha species-rich Mkusi Game Reserve in the hills some 7 km west of Sodwana State Forest is in the course of being incorporated into the iSimangaliso Wetland Park.

MANAGEMENT CONSTRAINTS

The most serious threats to the Park are damage to the hydrology and salinity of the wetland system and damage to the land by exploitation of its resources necessitated by a recent collapse in the tourist industry. The lake's salinity is satisfactory at present, but serious drought since 2002 has caused its level to fall to its lowest for 50 years. A sandbar across the mouth has formed, and, to exclude a 2002 oil spill, been re-inforced, to prevent a catastrophic invasion of seawater. Previous high salinity following drought killed off shoreline vegetation, causing bank erosion and silting of the lake. Recently, the Umfolozi River has also threatened to break into the lake, again raising the likelihood of sedimentation and invasion by sand and sea-water following breach of the sand bar. (Ezemvelo KZN Wildlife, 2005). Another potential threat is the reduction in the water supply by the transformation of the upper Mfolozi Swamps by agriculture.

The Park and surrounding rural areas are under great pressure from over-exploitation of the natural resources by the local population, who are now living off the land. This resulted from a government ban on 4WD vehicles in the coastal zone which led to a serious decline in the local tourism industry by removing the source of income for much of the population of the coasts and surrounding countryside

(Mail & Guardian Online, 2005). In addition, the spread of commercial gill-netting in the lake is no longer controlled, and poachers have been reported to be overexploiting the resources of False Bay. More than twenty species, including abalone, crayfish and prawns are at risk.

Infestation by alien invasive plants is also a problem, though limited in area at present. The worst of the invaders are *Chromolaena odorata, Psidium guajava, Pereckia acuelata* and *Melia azedarach*. Programs by the Plant Protection Research Institute to eliminate exotics have established a range of biological control agents, especially to remove plant infestations from important water-producing catchment areas, and the felling of tree plantations: 13,000 pine and eucalyptus trees are being removed to ensure greater seepage into the lake.

A proposal to dredge-mine heavy mineral ores in the dune forest, opposed by conservationists, led to an environmental impact assessment, to a decision ratified by the Cabinet in March 1996 to ban industrial development in the area and eventually to nomination of the Park as a World Heritage site. Although arrangements exist for managing oil spills, these comprise another threat such as from the oil tanker grounded nearby in 2002.

Finally, several land claims by impoverished communities have been lodged before the Land Claims Court. These areas include the Eastern Shores State Forest, Cape Vidal State Forest and Sodwana State Forest. One solution has been reached with the Mbuyazi whose rights near Cape Vidal have been recognised, not to settle, but to develop ancestral lands for tourism (Chikanga, 2004). More recently, there has been conflict over other large hotel developments launched in environmentally sensitive areas without contact with local stakeholders, environmental impact assessments or adequate infrastructure. By 2004 however it was stated that the land claimants and local communities were accepted as partners in the development of the Park (UNESCO, 2003, 2004).

STAFF

There is a total of 674 permanent staff and part-time employees, located at seven administrative centres, three management outposts and two research stations. Staff implement wildlife management programs, manage visitor facilities, environmental awareness programs and conduct research and monitoring projects. The responsibility for administering the Park lies with the Chief Conservator.

BUDGET

KNNCS headquarters administers 103 protected areas totalling 7,682,72 sq.km. It is a semi-autonomous and non-profit organisation, 60% funded by the KwaZulu-Natal provincial legislature. Under the former Natal Parks Board, the staff, now 4,300 strong, earned R429,942 (US$78,000) in the financial year 1997-98. The balance is from fees, accommodation charges, sale of curios and other sources of income.

LOCAL ADDRESS

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

REFERENCES

The principal source for the above information was the original nomination for World Heritage status.

Anon (2003). Ecotourism investment in S A's St. Lucia Park. *Afrol News*, December.

Chikanga, K. (2004). St. Lucia community finally get land back and plan to put it to good use. *Words and Deeds,* September.

Ezemvelo KZN Wildlife (2005). State of Lake St Lucia and the estuary. *Ezemvelo Kwazulu-Natal Wildlife News,* No.13, 23 August.

Hoyt, E. (2005). *Marine Protected Areas for Whales, Dolphins and Porpoises: a World Handbook for Cetacean Habitat Conservation.* Earthscan.

IUCN (2008). *The IUCN Red List of Threatened Species*. Gland, Switzerland & Cambridge, U.K.

KwaZulu-Natal Nature Conservation Service (1998). *Nomination proposal for The Greater St Lucia Wetland Park to be listed as a World Heritage site*. Submitted to the UNESCO World Heritage Centre (contains a thematic bibliography of over 100 references).

Mail & Guardian Online (2005). *4 x 4 Ban Causes Ecological Problems in Greater St. Lucia Wetlands Park World Heritage Site*. December.

Taylor, R. (1991). *The Greater St Lucia Wetland Park*. Natal Parks Board / Parke Davis.

Taylor, R. & Haldorsen, S. (2002). On the resilience of the Lake St Lucia. *Intercoast Network Newsletter* 42: 34-36.

UNESCO World Heritage Bureau (2003) *Report on the 27th Session of the WH Committee,* Paris.

---------- (2004) *Report on the 28th Session of the WH Committee,* Paris.

---------- (2008) *Report on the 32nd Session of the WH Committee,* Paris.

Venter, P *et al.* (2009). Discovery of a viable population of Coelacanths (*Latimeria Chalumnae* Smith, 1939) at Sodwana Bay, South Africa. *Science in Africa* No.2.

DATE

October 1999. Updated 1-2002, 12-2005, 12-2008, May 2011.