

Information Sheet on Ramsar Wetlands (RIS) – 2006-2008 version

Available for download from http://www.ramsar.org/ris/key_ris_index.htm.

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

Notes for compilers:

1. The RIS should be completed in accordance with the attached *Explanatory Notes and Guidelines for completing the Information Sheet on Ramsar Wetlands*. Compilers are strongly advised to read this guidance before filling in the RIS.
2. Further information and guidance in support of Ramsar site designations are provided in the *Strategic Framework and guidelines for the future development of the List of Wetlands of International Importance* (Ramsar Wise Use Handbook 7, 2nd edition, as amended by COP9 Resolution IX.1 Annex B). A 3rd edition of the Handbook, incorporating these amendments, is in preparation and will be available in 2006.
3. Once completed, the RIS (and accompanying map(s)) should be submitted to the Ramsar Secretariat. Compilers should provide an electronic (MS Word) copy of the RIS and, where possible, digital copies of all maps.

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

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Designation date

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Site Reference Number

2. Date this sheet was completed/updated:

20 January 2010

3. Country:

South Africa

4. Name of the Ramsar site:

The precise name of the designated site in one of the three official languages (English, French or Spanish) of the Convention. Alternative names, including in local language(s), should be given in parentheses after the precise name.

Ntsikeni Nature Reserve

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

This RIS is for (tick one box only):

a) Designation of a new Ramsar site ; or

b) Updated information on an existing Ramsar site

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

7. Map of site:

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

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

i) a hard copy (required for inclusion of site in the Ramsar List): ;

ii) an electronic format (e.g. a JPEG or ArcView image) ;

iii) a GIS file providing geo-referenced site boundary vectors and attribute tables .

b) Describe briefly the type of boundary delineation applied:

The boundary of the proposed Ramsar site is the same as the existing protected area boundary.

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

30°08'S; 29°28'E

9. General location:

Include in which part of the country and which large administrative region(s) the site lies and the location of the nearest large town.

KwaZulu-Natal Province; Umzimkhulu Local Municipality. The nearest large town is Kokstad which is approximately 45 km (line of sight) from the Nsikeni Nature Reserve. Kokstad was named after the Griqua leader, Adam Kok III. In 1861, he had come with his people, the Griquas, from Philippolis in the then southern 'Oranje Vrystaat', where they had had conflicts with the Voortrekkers (early Afrikaner pioneers trekking northwards to escape the English colonists in the Cape) – into the no-man's-land beyond the Drakensberg to settle there. Each Griqua head of family was given 1,200 hectares of land.

Today, Kokstad has about 45,000 inhabitants. The town is picturesquely situated in a valley 1,300 metres above sea-level in front of the backdrop of Mount Currie, 2,200 metres high, and the Ingeli mountains.

Kokstad supplies the surrounding farming area, where mainly cattle and sheep breeding and dairy production is undertaken.

(Text adapted from <http://www.southafrica-travel.net/kwazulu/kokstad.html>)

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

Maximum = 2321m; minimum = 1580m

11. Area: (in hectares)

Designated Protected area is 9200 ha, this includes a wetland area of approximately 1 070 ha.

12. General overview of the site:

Nsikeni vlei is a palustrine emergent wetland situated in a valley bottom position and dominated by sedges and grasses. The wetland, which is likely to be one of the largest high altitude (>1700 m) wetlands in South Africa, is in good condition and is performing valuable streamflow regulation, and biodiversity support functions. The important breeding habitat it provides for the Critically Endangered Wattled Crane (*Grus bugeranus*) and the Critically Endangered Eurasian Bittern (*Botaurus stellaris*) contribute greatly to its biodiversity value.

13. Ramsar Criteria:

Tick the box under each Criterion applied to the designation of the Ramsar site. See Annex II of the *Explanatory Notes and Guidelines* for the Criteria and guidelines for their application (adopted by Resolution VII.11). All Criteria which apply should be ticked.

1 • 2 • 3 • 4 • 5 • 6 • 7 • 8 • 9

1(the site contains a representative, rare, or unique example of a natural or near natural wetland type found within the appropriate biogeographic region), 2 (the site contains vulnerable, endangered, or critically endangered species or threatened ecological communities), 6 (a wetland should be considered internationally important if it regularly supports 1% of the individuals in a population of one species or subspecies of waterbird)

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

Criterion 1

The wetland provides a good example of a high altitude wetland in the eastern coastal slope, Drakensberg region (Cowan, 1995). The wetland, which is likely to be one of the largest high altitude wetlands, is in

good condition, as is its catchment, which is also entirely protected within the Nature Reserve. Presently there are no other Ramsar sites in this wetland region. Begg (1988) identified Ntsikeni wetland as one of KwaZulu-Natal's 28 priority wetlands. Following discussions by the Department of Economic Affairs, Environment and Tourism, Eastern Cape with the National Parks Board in 1993-1994, and based on a joint inspection and a literature survey, the Board concluded that the reserve warrants national park status on the basis of its natural features.

The site falls within an approximately 100 km² area that is very rich in wetlands, which includes three other major wetlands, the Kromrivier vlei (Begg, 1989), Cedarville flats wetland and the Franklin vlei (Begg, 1989). None of these wetlands have protected status, making it particularly important that Ntsikeni is afforded adequate protection and sound management. Furthermore, all three of the other wetlands are within intensively used, commercially farmed areas and have been impacted to varying degrees by on-site drainage and dams and off-site land-use activities in their catchments. The impacts on the Cedarville flats and the Franklin vlei have been particularly high. Ntsikeni vlei is therefore the only one of these wetlands with very low levels of hydrological impact and modification to its ecological character.

Criterion 2

The wetland provides a very important breeding site for the endangered Wattled Crane, the SA population of which is classified as Vulnerable on the IUCN Red List (Meine and Archibald, 1996). Two to three pairs of Wattled Cranes breed in the wetland out of 80 active breeding pairs throughout the country (McCann K, 1999. *Pers. comm.* Eskom/EWT National Crane Conservation Project). Based on the presence of three breeding pairs in 1986, Begg (1989) in a report on the priority wetlands of KwaZulu-Natal, considered Ntsikeni wetland to be second only to Mgeni vlei in terms of its importance as a breeding site for Wattled Crane in South Africa. Adding to its importance is the fact that the Wattled Crane is a conspicuous "flagship species". The wetland is also likely to support further Red Data species, notably the Endangered Long-toed Tree Frog (*Leptopelis xenodactylus*).

Criterion 6

Ntsikeni nature reserve provides a very important breeding site for Wattled Crane, with two to three pairs breeding in the wetland out of 68 active breeding pairs in the country. The wetland therefore supports 3 to 4% of the South African breeding population.

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

Name the relevant biogeographic region that includes the Ramsar site, and identify the biogeographic regionalisation system that has been applied.

a) biogeographic region: Grassland Biome

b) biogeographic regionalisation scheme (include reference citation): Drakensberg Foothill Moist Grassland, Vegetation type GS10; Eastern Temperate Freshwater Wetland, Vegetation Type (Muchina and Rutherford, 2004)

16. Physical features of the site:

The Ntsikeni wetland is surrounded and underlain by sandstone and mudstone of the Tarkastad formation. The wetland is of natural origin, and its presence is largely owing to several dolerite dykes and a major dolerite sill at the northern outlet of the wetland which form a series of erosion resistant strata across the Lubhukwini River (Begg, 1989).

The main body of the wetland comprises an upper portion, which is largely permanently saturated and lacks a clearly defined stream channel and a lower portion which has a clearly defined stream channel and

“backmarsh areas”. Extending out from the main body of the wetland are several tributary “arms” that supply the main body of the wetland with runoff water.

The soils in the wetland are primarily mineral, of the Katspruit form, but some organic-rich soils of the Champagne form, and possibly peat, are also expected to occur in the permanently saturated areas

Little information is available on water quality in the wetland. However, the water quality appears to be good based on the fact that: (1) there is a low level of human activity in the catchment; (2) Tricorythid mayflies and Elmid beetles, which are indicative of good quality water, were found in the stream within the wetland (Mangold and Moor, 1996); and (3) anecdotal evidence exists of the high clarity of the water in the wetland (see Begg, 1989).

17. Physical features of the catchment area:

Describe the surface area, general geology and geomorphological features, general soil types, and climate (including climate type).

The entire catchment of the wetland system falls within the 9200 ha Protected Area boundary which runs along the watershed. The catchment is characterised by a central broad flat valley bottom made up of alluvial sediments. These valley bottom areas then rise up into undulating grasslands mostly underlain by Tarkastad Mudstones and sandstones with some Adelaide mudrock and sandstone. The entire protected area is bounded by mountainous peaks which are capped with Karoo Dolerite.

The Protected Area falls within South Africa’s summer rainfall region, receiving a mean annual rainfall of 911mm. The mean temperature is 11.5°C with a mean maximum of 17.4°C and a mean minimum of 9.5°C. This area receives frequent severe frosts and snowfalls expected most years (Camp, 1998).

18. Hydrological values:

From the runoff data supplied by Middleton *et al.* (1981) , Begg (1989) estimated that the catchment of Ntsikeni vlei, which is 75 km², supplies a mean annual runoff of 22 x 10⁶ m³. The Ntsikeni vlei is situated high in the Umzimkulu catchment, and based on the low level of human activity upstream of the wetland, pollutant input into the wetland is likely to be low. Therefore the primary hydrological value is in streamflow regulation and not sediment entrapment. The major benefit of this wetland is the moderated and sustained flow of clean water provision for downstream communities, where there is no formal bulk water supply.

This value has long been recognized because in 1950 the Government bought the following farms from private owners as they were recognised then as important water catchment areas; Clairmont 45, Longridge 47, Killarney 48, Mount Pleasant 49, Abergeldy 50, Glengyle 51, Rokeby Park 52 and Milton 53. The Ntsikeni Nature Reserve was established in terms of the Forest Act, 1941 under Government Notice No. 560 of 1950 and in the Transkei Government Gazette No. 53 dated 1 September 1978.

19. Wetland Types

a) presence:

Circle or underline the applicable codes for the wetland types of the Ramsar “Classification System for Wetland Type” present in the Ramsar site. Descriptions of each wetland type code are provided in Annex I of the *Explanatory Notes & Guidelines*.

Marine/coastal: A • B • C • D • E • F • G • H • I • J • K • Zk(a)

Inland: L • M • N • O • P • Q • R • Sp • Ss • Ip • Ts • U • Va •
Vt • W • Xf • Xp • Y • Zg • Zk(b)

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

b) dominance:

List the wetland types identified in a) above in order of their dominance (by area) in the Ramsar site, starting with the wetland type with the largest area.

Tp-Permanent freshwater marshes/pools

20. General ecological features:

Provide further description, as appropriate, of the main habitats, vegetation types, plant and animal communities present in the Ramsar site, and the ecosystem services of the site and the benefits derived from them.

The wetland falls within the grassland biome in the Drakensberg Foothill Moist Grassland (Vegetation type GS10; Muchina and Rutherford, 2004). Interspersed within the grassland are patches of indigenous scrub and protea woodlands. The permanently saturated/flooded marsh is dominated by the sedge *Carex acutiformis*. The hummocked sedge meadow is dominated by a mixture of grass (e.g. *Aristida junciformis*) and sedge species (e.g. *Bulbostylis schoenoides*). The seasonally waterlogged zone and wet grassland transitional to the wetland and the surrounding non-wetland areas are dominated by a mixture of grass species. Alien plants are largely absent from within the wetland but alien invasive tree species occupy approximately 1% of the wetland's catchment.

As this protected area falls into a sourveld area (high production spring and summer, but low palatability over winter) the carrying capacity and stocking rates of grazing ungulates is inherently low.

Fire is the key ecological process that maintains plant vigour, basal cover and species diversity in the catchment and wetlands, whilst also reducing the rate of spread of alien invasive plants. This in turn facilitates sustainable clean water production for the downstream communities.

21. Noteworthy flora:

Hummocked sedge meadow areas, which are extensive in Ntsikeni wetland, are unique to high altitude wetlands (Kotze and O' Connor, 2000). Although a floristic description of the wetland has not been undertaken, a plant species list for the reserve has been compiled. The wetland falls between two centres of plant species endemism, namely Eastern Mountain and Pondoland (Cowling and Hilton-Taylor, 1997).

The following plant species recorded for Ntsikeni Nature Reserve are listed as threatened (Scott-Shaw, 1999): *Eucomis autumnalis* ssp. *autumnalis*, *Hesperantha tysonii*, *Watsonia inclinata*, *Schizochilus bulbinella*, *Schizochilus bulbinella*, *Delosperma gracile*, *Aspidonepis flava*, *Englerodaphne pilosa*, *Manulea florifera*, *Protea subvestita*, *Xysmalobium tysonianum*. Please also refer to Appendix 2

22. Noteworthy fauna:

Provide additional information on particular species and why they are noteworthy (expanding as necessary on information provided in 14. Justification for the application of the Criteria) indicating, e.g., which species/communities are unique, rare, endangered or biogeographically important, etc., including count data. *Do not include here taxonomic lists of species present – these may be supplied as supplementary information to the RIS.*

Ntsikeni nature reserve provides a very important breeding site for Wattled Crane, with two to three pairs breeding in the wetland out of 68 active breeding pairs in the country. The wetland therefore supports 3 to 4% of the South African breeding population. Several other bird species e.g. Eurasian Bittern (*Botaurus stellaris*) and Lammergeyer (*Gypaetus barbatus*).

Several wetland associated mammal species recorded are the Water Mongoose (*Atilax paludinosus*) and Cape Clawless Otter (*Aonyx capensis*); other noteworthy mammals are the Endangered Oribi (*Ourebia ourebi*), Southern Reedbuck (*Redunca arundinum*) and Serval (*Felis serval*).

On the mountain slopes within the Nature Reserve, a roosting colony of approximately 30 - 40 Cape Vultures (*Gyps coprotheres*) occurs, and a pair of the Endangered Lammergeyer (*Gypaetus barbatus*) nest in the reserve.

The Ntsikeni wetland holds important herpetofauna, possibly even undescribed taxa (Burger 1996). The threatened and KZN endemic Long-toed Tree frog (*Leptopelis xenodactylis*) has been recorded in the reserve (D. Hoddinott, pers. obs.).

23. Social and cultural values:

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

The wetland provides a key source of sustained potable water for poor rural communities downstream of the wetland. The wetland supports plant species that provide a source of fibre for weaving. Currently, the collection of wood from invasive alien trees takes place by the neighbouring communities.

Any future planned use of the wetland will be consistent with the maintenance of natural wetland processes and ecological character, and will be guided by an Integrated Management Plan

The cultural heritage has not been well investigated; however there is at least one San Rock Art site and several graves within the nature reserve.

Cultural Heritage

As formal heritage surveys has not yet been conducted our knowledge regarding the distribution and evaluation of cultural heritage sites in the Coleford-Ntsikeni corridor is incomplete. A cultural heritage audit of the most visible and known sites in the area revealed two San rock art sites. One is located within the Ntsikeni Nature Reserve and another on the adjacent farm Kingscote . Both sites contain paintings in reasonable state of preservation and some archaeological deposit. Early Stone Age sites have been recorded in the nearby Creighton area but none has yet been located at the Ntsekeni Vlei. In addition, three historical farmsteads and associated grave sites are known to be located at Ntsikeni Vlei. As the area has been frequented by African subsistence farmers since at least the 1820's one can expect the occurrence of Late Iron Age sites but none of these have yet been located.

Socio-cultural

The first modern people at Ntsikeni Vlei would have been the San of Bushmen. This population occupied the southern and eastern Maloti Drakensberg bioregion from approximately 20 000 years ago. Although no research has been done on San prehistory in the Ntsikeni Vlei area two rock art sites attest to their presence in the prehistoric past. During the historical period the San in this region played an active role in the hunting of elephant for ivory. These ivory tusks were traded with African groups such as the Bhaca and Ntlangwini who settled in the area around the 1820's. Eventually the San assimilated with their African neighbours and lost most of their hunter-gatherer identity. The Ndobe clan who occupies areas of the former Umzimkhulu homeland claims to be the direct descendants of these early San populations. African groups who settled in this area were mostly refugees from the expansionistic policies of the emergent Zulu state under Shaka. They included groups such as the Wushe, Ntlangwini, Bhaca, Nqolo, Nzelu, Cunu, Nci, and Nzelu. These groups were never formally incorporated into the Zulu kingdom. Today most of these groups speak Xhosa although siBhacha as is still spoken by some elders is classified as a separate language. In 1845 these African subsistence farmers were given permission by the British colonial authorities to settle in the Umzimkhulu district. White farmers occupied farms in the area from about 1840 onwards.

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

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

- i) sites which provide a model of wetland wise use, demonstrating the application of traditional knowledge and methods of management and use that maintain the ecological character of the wetland:

- ii) sites which have exceptional cultural traditions or records of former civilizations that have influenced the ecological character of the wetland:
- iii) sites where the ecological character of the wetland depends on the interaction with local communities or indigenous peoples:
- iv) sites where relevant non-material values such as sacred sites are present and their existence is strongly linked with the maintenance of the ecological character of the wetland:

24. Land tenure/ownership:

- a) within the Ramsar site: State

- b) in the surrounding area: Privately owned agricultural land in the west and south west and the remainder is Malenge Tribal Authority land.

25. Current land (including water) use:

- a) within the Ramsar site: Nature Conservation, including the entire catchment.

- b) in the surroundings/catchment: The surrounding area is a mix of commercial and communal livestock stock grazing interspersed with plantation forestry and subsistence agriculture.

26. Factors (past, present or potential) adversely affecting the site's ecological character, including changes in land (including water) use and development projects:

- a) within the Ramsar site:

The Rennies Wetland Project and Eastern Cape Nature Conservation survey of the wetland in 1998-1999, showed that there are some abandoned artificial drainage channels in some of the tributary arms of the wetland, and most of these were becoming progressively shallower with the establishment of vegetation and trapping of sediment. A 300 m long and 1 m deep drainage channel is present in one of the side tongues, for which the Rennies Wetland Project and Eastern Cape Nature Conservation have developed rehabilitation plans. Working for Wetlands, funded by the Department of Environmental Affairs and Tourism (DEAT), built numerous concrete mass gravity structures and gabions in eroding sections of the wetland in the period 2000 – 2007. The wetland's hydrological processes are intact and functioning.

Although alien invasive tree species (*Acacia spp.* and *Eucalyptus spp.*) wattles have infested some of the drainage lines feeding the wetland, factors altering the quantity and timing of water entering the wetland such as afforestation, dams and irrigation are absent from the wetland's catchment. Alien invasive tree species are absent from the wetland and those in the catchment are in the process of being cleared.

There is some localised erosion within the wetland and its catchment, associated particularly with old livestock paths and poorly maintained vehicle tracks. Increased control of livestock grazing and vehicle movement is improving this situation, and other common sources of sediment (e.g. cultivated lands) are extremely small. Thus, the quality of water entering and leaving the wetland is unlikely to have been greatly modified.

The wetland and its associated plant species evolved under a burning regime. The frequency of burning has, however, increased and currently extensive fires occur across the wetland in most years. Although this is to the detriment of certain wetland dependent species, the current burning regime has not had a major detrimental effect on overall hydrological integrity of the wetland. A less frequent and extensive burning regime is planned for the future in order to increase the ecological benefits provided by the wetland.

Overall therefore, the ecological character of the wetland has not been greatly altered, and there are no major threats present which are likely to affect it in the near future. The potential that exists for pressure from surrounding communities on the reserve's resources to significantly affect its ecological character is

considered very low owing to (1) the sound relations that exist between the surrounding communities and the reserve management, (2) the conservation measures given in the following section and (3) the fact that the wetland is generally resilient to grazing and does not have a high erosion hazard.

b) in the surrounding area:

Surrounding communal and commercial grazing is unlikely to be having any negative effect on the hydrological functioning of the wetland and its catchment. However, the commercial afforestation is serving as a major source of alien invasive species such as American Bramble (*Rubus cuneifolius*). The timber industry is in an aggressively expanding phase in the general area, resulting in an additional demand for fibre. This has the potential to increase afforestation adjacent to the protected area which would result in habitat fragmentation and isolation.

27. Conservation measures taken:

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

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

Nature Reserve

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

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

c) Does an officially approved management plan exist; and is it being implemented?: No, not yet. The management planning process is underway, which is in line with the requirements of National Environmental Management: Protected Areas Act 2003.

d) Describe any other current management practices: A Local Board is in the process of being established in terms of section 25 (chapter 5) of the KwaZulu-Natal Nature Conservation Management Act, No. 9 of 1997. The objective of developing a local board is to allow for increased local participation in the decision making with respect to the Protected Area.

28. Conservation measures proposed but not yet implemented:

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

The Protected Area is currently being fenced - completion is due for the end of 2007. The Integrated Management Plan should be completed and adopted by 2008. A re-introduction of indigenous ungulates is planned for 2008. Invasive alien plant species eradication will continue.

29. Current scientific research and facilities:

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

Annual counts of cranes, Oribi and vultures are undertaken. There are no research facilities or registered research projects taking place currently. The nearest research accommodation is at Coleford Nature Reserve about 40km away.

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

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

Environmental interpretation and education using NNR's natural and cultural resources is aimed at creating awareness, understanding and appreciation of the value of these resources among the general public and visitors to NNR. An environmental education programme is in accordance with the EKZ/NW Environmental Education Policy and Framework No. 4.23. The programmes have not been initiated but there have been plans on the development. Part of this programme include the existing Biodiversity Environmental Education Programme (**BEEP**) designed in conjunction with the Endangered Wildlife Trust and which focuses on endangered species.

Where and whenever possible members of the local community (*e.g.* community tour guides) should be empowered and used to run appropriate environmental awareness and education tours. Other new ones include 'Kids and Parks and Youth in Conservation. An interpretation programme using signage, displays and information media must be developed to effectively direct and inform visitors in respect of appropriate natural and cultural features of the area. The format of these signs must be standardised and trail marking must be a priority.

Pamphlets, brochures and other reading materials are being distributed currently to members of public (community) and schools via teachers in the surrounding schools. School visits have not been initiated as yet. Current Land Use is for nature conservation as a protected area, ecosystem services are provided by the NNR.

In the process of developing Local Boards according to the KwaZulu-Natal Nature Conservation Management Act of 1997: Chapter 5.

31. Current recreation and tourism:

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

There is currently a community owned and run lodge and a second one that is nearing completion. The access road to these facilities was upgraded using labour intensive methods in 2006; however access is largely limited to 4X4 vehicles.

Overall, tourism is low intensity and currently restricted to primarily a birding niche market.

32. Jurisdiction:

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

Republic of South Africa, KwaZulu-Natal Province, Sisonke District Municipality, Umzimkhulu Local Municipality. KZN Nature Conservation Management Board.

33. Management authority:

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

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www.kznwildlife.com

General Manager uKhahlamba Region
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34. Bibliographical references:

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

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<http://www.southafrica-travel.net/kwazulu/kokstad.html>

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Appendix 2: Plant species lists for Ntsikeni Nature Reserve (compiled by Tony Abbott, November 1999)

Note: species marked with a "y" occur within the Ntsikeni wetland itself

Status (IUCN categories) Lrlc=Lower risk(conservation dependent); Lrnt = Lower risk (Near threatened);

VU= Vulnerable; DD=Data deficient

	Occurrence in wetland	Status	Species Name	
			Podocarpus latifolius	
			MONOCOTYLEDONAE	
			Agrostis eriantha var. eriantha	y
			Albuca fastigiata	
			Albuca nelsonii	
			Albuca setosa	y
			Albuca shawii	
			Aloe pratensis	
			Anemone fanninii	
			Anthoxanthum ecklonii	y?
			Aponogeton junceus subsp. junceus	y
			Aponogeton junceus subsp. natalense	y
			Arundinella nepalensis	y
			Ascolepis capensis	y
			Asparagus microraphis	
			Brownleea galpinii subsp. major	
			Brownleea parviflora	
			Bulbine abyssinica	
			Bulbostylis humilis	y
			Bulbostylis oritrephes	y
			Bulbostylis schoenoides	y
ALGAE				
Nitella sp.	y			
BRYOPHYTA				
Braunia secunda				
Thuidium natarumense				
PTERIDOPHYTA				
Adiantum poiretii				
Cheilanthes quadripinnata	y			
Dryopteris athamantica				
Dryopteris inequalis				
Loxogramme lanceolata				
Mohria caffrorum var. caffrorum				
Polypodium polypodioides				
Polystichum pungens				
Polystichum transvaalense				
Thelypteris bergiana				
GYMNOSPERMAE				
Podocarpus henkelii				

Bulbostylis scleropus	y?		Disa versicolor	y	
Carex acutiformis	y		Disperis stenoplectron	y	
Carex austro-africanus	y		Disperis tysonii		
Carex leporina	y?		Disperis wealii		
Chlorophytum comosum	y		Eleocharis palustris	y	
Chlorophytum sp.	y		Eragrostis planiculmis	y	
Corycium dracomontanum			Eriocaulon dregei var. sonderianum	y	
Crocasmia aurea var. aurea			Eucomis autumnalis ssp. autumnalis		VU
Cyperus denudatus	y		Eucomis bicolor	y	
Cyperus obtusiflorus var. sphaerocephalus	y?		Eucomis comosa var. striata	y	
Cyperus rupestris var. rupestris	y?		Eulophia aculeata subsp. huttonii	y	
Cyperus sp.			Eulophia clavicornis var. clavicornis		
Cyrtanthus breviflorus	y		Eulophia ovalis subsp. ovalis	y	
Cyrtanthus epiphyticus	y	LRlc	Eulophia zeyheriana		
Cyrtanthus mackenii var. cooperi	y		Euplophia ovalis		
Cyrtanthus sp.			Festuca costata		
Cyrtanthus stenanthus var. major			Festuca scabra		
Cyrtanthus tuckii	y		Ficina cinnamomea	y?	
Cyrtanthus tuckii var. transvaalensis	y		Gladiolus crassifolius		
Dierama argyreum		LRlc	Gladiolus dalenii		
Dierama dissimile			Gladiolus ecklonii subsp. ecklonii		
Dierama igneum			Gladiolus longicollis var. longicollis		
Dierama pauciflorum			Gladiolus ochroleucas var. ochroleucas	y	
Dierama sp. cf. D. igneum			Gladiolus oppositiflorus subsp. salmoneus		
Dierama trichorhizum			Gladiolus papilio	y	
Diheteropogon filifolius			Gladiolus permeabilis subsp. wilsonii	y	
Disa cornuta			Habenaria cornuta		
Disa fragrans					
Habenaria dives			Ledebouria cooperi	y	
			Ledebouria ovatifolia		
Habenaria laevigata			Leersia hexandra	y	
Habenaria lithophila			Loudetia densispica	y?	
Habenaria malacophylla			Luzula africana		
Habenaria schimperiana	y		Mariscus congestus	y	
Habeneria dives			Massonia jasminiflora		
Harpochloa falx			Monocymbium ceresiiforme	y	
Hesperantha baurii subsp. baurii	y		Moraea brevistyla	y	
Hesperantha candida	y		Moraea huttonii		
Hesperantha sp.			Moraea modesta		
Hesperantha sp.			Moraea stricta	y	
Hesperantha tysonii		LRlc	Moraea trifida	y	
Holothrix scopularia			Myrsiphyllum asparagoides		
Isolepis costata var. macra	y		Neobolusia tysonii		
Isolepis fluitans	y		Neobolusia virginea		
Juncus effusus	y		Nerine appendiculata	y	
Juncus oxycarpus	y		Nerine pancratioides		
Kniphofia caulescens	y		Osteospermum jucundum		
Kniphofia laxiflora	y		Panicum ecklonii		
Kniphofia triangularis subsp. triangularis			Pennisetum thunbergii	y	
cf. Lagarosiphon verticillifolius	y		Satyrium longicauda var. longicauda	y	
Poa binata	y		Satyrium parviflorum		
			Satyrium sphaerocarpum		
Protasparagus virgatus	y		Satyrium trinerve	y	
Pterygodium cooperi			Schizochilus angustifolius		
Pterygodium hastatum			Schizochilus bulbinella	y	LRlc
Pterygodium magnum	y		Schizochilus flexuosus		
Pycreus macranthus	y		Schizoglossum nitidum+D208	y	
Pycreus sp.	y		Schizostylis coccinea	y	
Pycreus unioloides	y		Schoenoplectus corymbosus	y	
Rendlia altera			Schoenoxiphium cf. ludwigii	y	
Satyrium cristatum var. cristatum	y		Scirpus falsus	y?	
Satyrium hallackii subsp. ocellatum	y		Sporobolus centrifugus		

Stenoglottis fimbriata			Agrimonia odorata		
Stiburus conrathii	y		Ajuga ophrydes		
Themeda triandra			Alchemilla incurvata		
Trachypogon spicatus			Alectra sessiliflora var. sessiliflora		
Tristachya leucothrix			Alectra thyrsoidea		
Tritonia lineata var. lineata			Alepidea amatymbica	y	LRnt
Tulbaghia leucantha			Alepidea longifolia ssp. longifolia	y	
Urginea capitata			Alepidea natalensis		
Watsonia confusa			Alepidea woodii		
Watsonia inclinata		LRnt	Alepidia sp.		
Watsonia lepida			Anemone caffra		
Watsonia pillansii			Anemone fanninii		
Watsonia sp.			Anisodonteia julii subsp. julii		
Wurmbea kraussii			Anthospermum herbaceum	y	
Xyris gerrardii	y		Aponogeton junceus subsp. junceus	y	
Zantedeschia aethiopica	y		Argyrobium marginatum		
DICOTYLEDONAE			Argyrobium tomentosum		
Acalypha peduncularis			Asclepias cucullata		
Acalypha schinzii			Asclepias multicaulis		
Agrimonia bracteata	y				
Asclepias stellifera			Cyathula uncinulata		
			Cycnium racemosum		
Aspidoglossum fasciculare			Cyphia elata		
Aspidonepis flava		LRlc	Cysticapnos pruinosis		
Aster perfoliatus			Cysticapnos sp.		
Athrixia fontana			Delosperma caespitosum forma		
Begonia sutherlandii			caespitosim		
Berkheya cirsiifolia			Delosperma gracile		DD
Berkheya multijuga	y		Delosperma sp.		
Berkheya onopordifolia var. onopordifolia			Denekia capensis	y	
Berkheya rhapontica subsp. aristosa var. aristosa			Desmodium repandum		
Berkheya rhapontica subsp. aristosa var. exaltata			Dianthus basuticus subsp. basuticus		
Brachystelma cordifolia			Diclis reptans	y	
Buddleja loricata			Dicoma sp.	y	
Calpurnia sericea			Dicoma anomala subsp. anomala		
Carissa bispinosa var. bispinosa			Dierama trichorhizum		
Cephalaria natalensis	y		Drosera natalensis	y	
Cephalaria oblongifolia	y		Empodium elongatum		
Cerastium arabis			Englerodaphne pilosa		LRlc
Chironia krebsii	y		Epilobium capense		
Chrysocoma ciliata			Erica algida	y	
Cliffortia paucistaminea			Erica caffrorum var. caffrorum		
Clutia pulchella var. franksiae	y		Erica woodii		
Conium chaerophylloides			Eriosema distinctum	y	
Convolvulus natalensis var. natalensis			Eriosema kraussianum		
Convolvulus natalensis var. transvaalensis			Euclea crispa var. crispa		
Conyza obscura	y		Eugenia zuluensis		
Conyza pinnata	y		Euphorbia natalensis		
Cotula hispida			Euphorbia sp.		
Crassula alba var. alba			Euphorbia striata var. striata		
Crassula inanis	y		Euryops laxus		
Crassula lanceolata subsp. lanceolata			Euryops tysonii		
Crassula languinosa var. pachystemon	y		Felicia linearis		
Crassula nudicaulis var. nudicaulis			Felicia rosulata		
Crassula pellucida ssp. brachypetala			Galium capense subsp. garipense		
Crassula sarcocaulis subsp. rupicola	y		Galium thunbergianum var. thunbergianum		
Crassula setulosa var. rubra			Galopina circaeoides	y	
Crassula setulosa var. setulosa			Gazania krebsiana subsp. krebsiana		
Craterocapsa congesta			Geranium pulchrum		
Craterocapsa tarsodes			Geranium schlechteri		
Crepis hypochoeridea			Geranium wakkerstroomianum		
			Gerbera ambigua		
			Gerbera parva		

Gerbera viridifolia subsp. viridifolia	y	Graderia scabra	y	
Geum capense	y	Gunnera perpensa	y	
Gnaphalium filagopsis		Guthria capensis		
Gnaphalium griquense		Hebenstretia dura		
Gnidia baurii		Helichrysum adenocarpum	y	
Gnidia kraussiana var. kraussiana		Helichrysum chionosphaerum		
Helichrysum adenocarpum subsp. adenocarpum		Helichrysum cooperi		
		Helichrysum ecklonis		
Helichrysum argentissimum		Helichrysum epapposum		
Helichrysum aureum var. monocephalum		Helichrysum glomeratum		
Helichrysum cephaloideum				
Helichrysum grandibracteatum		Luzula africana		
		Manulea crassifolia subsp. crassifolia		
Helichrysum herbaceum	y	Manulea florifera	y	LRlc
Helichrysum heterolasium		Manulea paniculata		
Helichrysum krookii		Melasma scabrum	y	
Helichrysum melanacme		Melolobium alpinum		
Helichrysum mundtii		Melolobium microphyllum		
Helichrysum nanum	y	Mentha aquatica	y	
Helichrysum natalitium		Mimulus gracilis	y	
Helichrysum nudifolium		Monopsis decipiens		
Helichrysum odoratissimum		Monsonia brevirostrata	y	
Helichrysum pilosellum	y	Monsonia grandifolia		
Helichrysum simillimum		Myosotis sylvatica		
Helichrysum simulans	y	Myrica sp. cf. M. brevifolia		
Helichrysum spiralepis		Nemesia caerulea		
Helichrysum splendidum		Nemesia sylvatica	y	
Helichrysum subfalcatum		Nidorella agria		
Helichrysum sutherlandii		Nidorella undulata	y	
Helichrysum tenax var. tenax		Osteospermum caulescens		
Helichrysum trilineatum		Osteospermum jucundum		
Hemizygia stenophylla		Otholobium polysticta		
Hermannia depressa	y	Othonna natalensis		
Hermannia schlechteriana		Oxalis smithiana		
Hermannia woodii		Papaver aculeatum		
Hirpicium ameroides	y	Passerina filiformis		
Hypericum lalandii		Pelargonium alchemilloides		
Hypoestes triflora		Pelargonium inquinans		
Hypoxis argentea var. sericea		Pelargonium luridum		
Hypoxis filiformis		Pelargonium ranunculophyllum		
Hypoxis galpinii		Pelargonium sp. cf. luridum		
Hypoxis multiceps		Pelargonium zonale		
Hypoxis rigidula var. pilosissima		Peperomia retusa var. retusa	y	
Hypoxis rigidula var. rigidula		Phytolacca octandra		
Indigofera dregeana		Pimpinella caffra		
Indigofera gerrardina		Plantago lanceolata		
Indigofera verrucosa		Plectranthus dolichopodus		
Isoglossa cooperi		Plectranthus laxiflorus		
Kiggelaria africana		Polygala rehmannii		
Kohautia amatymbica		Polygala rhinostigma		
Lagarosiphon major	y	Polygonum aviculare		
Laportea peduncularis subsp. peduncularis	y	Protea subvestita		LRnt
Leucosidea sericea		Psammotropha sp.	y	
Limosella longiflora	y	Psammotropha mucronata		
Linum thunbergii		Pseudognaphalium luteo-album		
Lobelia angolensis		Ptaeroxylon obliquum		
Lobelia erinus	y	Pygmaeothamnus chamaedendrum		
Lobelia vanreenensis		Pygmaeothamnus chamaedendrum var.y setulosus		
Lotononis biflora		Rabdosiella calycina	y	
Lotononis laxa		Ranunculus meyeri	y	
Lotononis puchella		Ranunculus multifidus	y	
Lotononis sericophylla	y			

Raphionacme hirsuta			Rhus discolor	
Rhamnus prinoides		y	Rhus montana	
Rhodohypoxis baurii var. baurii			Rumex acetosella subsp. angiocarpus	
Rhodohypoxis baurii var. platypetala				
Scabiosa columbaria			Utricularia gibba	
Schizoglossum bidens subsp. pachyglossum			Utricularia livida	y
Schizoglossum flavum Schltr.			Vepris lanceolata	
Schizoglossum nitidum			Wahlenbergia appressifolia	
Scolopia mundii			Wahlenbergia cuspidata	
Sebaea bojeri			Wahlenbergia denudata	
Sebaea natalensis		y	Wahlenbergia huttonii	
Sebaea sedoides var. confertiflora			Wahlenbergia lycopodioides	
Sebaea sedoides var. schoenlandii			Wahlenbergia paucidentata	
Sebaea sedoides var. sedoides		y	Wahlenbergia rivularis	
Sebaea spathulata			Wahlenbergia undulata	
Selago galpinii			Xysmalobium involucreatum	
Senecio cathcartensis		y	Xysmalobium parviflorum	
Senecio erubescens var. crepidifolius		y	Xysmalobium tysonianum	LRlc
Senecio gregatus			Zaluzianskya pulvinata	
Senecio harveianus		y	Zaluzianskya glareosa	
Senecio inaequidens			Zaluzianskya microsiphon	
Senecio lygodes			Zaluzianskya ovata	
Senecio oxyodontus		y	Zaluzianskya pachyrrhiza	
Senecio polyodon var. subglaber		y		
Senecio subcoriaceus				
Senecio subrubriflorus				
Silene bellidioides		y		
Silene burchellii var. angustifolia				
Silene undulata				
Sonchus integrifolius var. schlechteri				
Stachys caffra				
Stachys grandifolia				
Stachys tubulosa				
Streptocarpus pusillus				
Striga bilabiata				
Sutera breviflora				
Sutera floribunda				
Tephrosia capensis				
Thalictrum rynchocarpum				
Thesium orientale				
Trimeria grandifolia				
Ursinia alpina				
Ursinia tenuiloba				
Urtica urens		y		

Appendix 3: List of taxa for freshwater biota, amphibians and reptiles in the Ntsikeni wetland (from Bok and Cambray 1996, Burger 1996, Mangold and de Moore 1996)

	Occurrence in	wetland	Number of	species
TURBELLARIA				
Planariidae	y		1	
ANNELIDA				
OLIGOCHAETA	y		1	
HIRUDINEA	y		1	
MOLLUSCA				
GASTROPODA				
Bulininae	y		1	
<i>Bulinus tropicus</i>				
PELECYPODA				
Sphaeriidae	y		1	
<i>Sphaerium ?incomitatum</i>	y			
CRUSTACEA				
CLADOCERA	y		1	
ARACHNIDA				
HYDRACARINA	y		1	
INSECTA				
EPHEMEROPTA				
Baetidae	y		3	
<i>Afroptilum sudafricanum</i>	y			
<i>Baetis harrisoni</i>	y			
<i>Baetis latus</i>	y			
<i>Demoulinia crassi</i>	y			
Tricorythidae	y		1	
Caenidae	y		2	
PLECOPTERA				
Notonemouridae	y		2	
ZYGOPTERA				
Coenagrionidae	y		2	
ANISOPTERA				
Ashnidae	y		1	
HEMIPTERA				
Veliidae	y		1	
Corixidae	y		2	
Pleidae	y		1	
Notonectidae	y		1	
TRICHOPTERA				
Hydropsychidae	y		2	
Ecnomidae	y		2	
Hydroptilidae	y		1	
Lepidostomidae	y		1	
COLEOPTERA				
Dytiscidae	y		2	
Gyrinidae	y		1	
Hydraenidae	y		2	
Elmidae	y		2	
DIPTERA				
Simuliidae	y		2	
<i>Simulium brachium</i>	y			
<i>Simulium nigrirarse</i>	y			
<i>Simulium ?impukane</i>	y			
Tanyponidae	y		2	
Orthoclaadiinae	y		2	
Chironomini	y		1	
Tanytrarsini	y		1	
Ceratopogonidae	y		1	
Muscidae	y		1	
AMPHIBIA				
<i>Breviceps verrucosus</i>	y			5
<i>Cacosternum nanum</i>	y			
<i>Rana angolensis</i>	y			
<i>Strongylopus grayii</i>	y			
<i>Xenopus laevis</i>	y			
REPTILIA				
<i>Mabuya striata</i>				1



Plate 1: Ntsikeni Nature Reserve, northern wetland section September 2006



Plate 2: Ntsikeni Nature Reserve, northern wetland section September 2006



Plate 3: Ntsikeni Nature Reserve, Protea woodland



Plate 4: Ntsikeni Nature Reserve, waterfall



Plate 5: Ntsikeni Nature Reserve, Ntsikeni Hill.



Plate 6: High floral diversity in Ntsikeni Nature Reserve.



Plate 7: Typical view in the of the landscape surrounding the wetland system within the Ntsikeni Nature Reserve.



Plate 8: The view of the main portion of the Ntsikeni Nature Reserve's wetland system.



Plate 9: Birding Monitoring in the Ntsikeni Nature Reserve.



Plate 10: Ntsikeni Nature Reserve – Viewscape of Wetland.