

BLESBOKSPRUIT: RAMSAR DATA

1. COUNTRY

Republic of South Africa

2. DATE OF COMPILATION

Originally completed: 1992-08-20

Updated: 1995-08-20

3. REFERENCE NUMBER

Not yet available.

4. COMPILER

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5. NAME OF WETLAND

Blesbokspruit (Marievale nature reserve)

6. DATE OF RAMSAR DESIGNATION

2 December 1986.

7. GEOGRAPHICAL CO-ORDINATES

26°12' - 26°23' S
28°30' E.

8. GENERAL LOCATION

In Springs district, about 3 km east of the town of Springs, province of Gauteng.

9. AREA

1 409 ha according to Swart (1991). (1 858 ha P.C. Compaan)

9.1 BOUNDARY INTEGRITY

No changes in the designated area's boundaries.

10. WETLAND TYPE

M (River/streams/creeks: permanent)
Sp (Freshwater marshes/pools: permanent)

11. ALTITUDE

1 585 m above sea level.

12. OVERVIEW OF SITE.

The Blesbokspruit is a typical highveld vlei dominated by common reed *Phragmites communis* and greater reedmace *Typha latifolia*, with some *Juncus* and *Cyperus* species. To the

north of Springs the spruit flows through a wide grassy valley which is probably the historical condition of the whole valley. Between Springs and Marievale Bird Sanctuary water levels in the spruit are artificially maintained by embankments and by mining, industrial and municipal effluents. Pollution from these also produce highly eutrophic water conditions favoured by vast reedbeds which provide habitat for a variety of birds. The permanently waterlogged parts are fringed by a band of *Paspalum dilitatum*, and the drier areas also have grasses but no trees. An important food plant for geese *Alisma plantago* also occurs, and there are patches of *Potamogeton* species in places.

13. PHYSICAL FEATURES

13.1 Geology and geomorphology

The geology of the area is fairly simple with flat lying sedimentary rocks of Karoo and Transvaal age (250 ma and 2 200 ma respectively) overlying older formations of gold bearing Witwatersrand (2 500 ma).

The Blesbokspruit flows southerly through the Groot valley Mines (Pty) Ltd area into the Marievale Bird Sanctuary which is the mining area of Marievale Ltd. Gold has been exploited from the Witwatersrand reefs in the East Rand since the turn of the century, however in the area under discussion, these reefs do not crop out on the surface. The Black Reef Quartzite Formation overlies the Witwatersrand strata unconformably and is in turn overlain by Malmani dolomites which form an important natural water reservoir, these two formations form a part of the Transvaal sequence. Extensive erosion took place prior to the deposition of the Karoo sequence. The basal formation of this sequence, the Dwyka Diamictite Formation is a clay-rich rock containing rounded rock fragments (up to boulder size) and is the product of Carboniferous continental glaciation. Overlying the diamictite, and the most common rock types to be found in the area, are sandstones and shales of the Vryheid Formation. Associated with this strata are coal seams which

have been mined adjacent to the Blesbokspruit in the Groot valley area. During the entire geological history of the area, the whole sequence of rock has been intruded by igneous rock (mainly dolerite).

The pattern of the outcropping rock strata today reflects an inlier, where younger rock (Karoo) has been eroded along the course of the Blesbokspruit and the older rocks (Transvaal) can thus be seen adjacent to the spruit.

13.2 Origins

Before mining operations commenced in the early 1930's the area was typical flat highveld terrain of grassland and crop farming. The Blesbokspruit ran through the area unrestricted with little or no reedbeds along its banks. As part of the mining operations, a number of embankments were built across the Blesbokspruit for roads and pipelines. These caused a certain amount of flooding and vast stretches of shallow water were formed, creating one of the few permanent wetlands in the old Transvaal. With the mining operations, rock dumps and slimes dams were built, changing the character of the area.

13.3 Hydrology

See the report of Wates *et al.* (1993).

13.4 Soil type and chemistry

Soil analysis report of 26.10.1983 provided by the Citrus Exchange:

	(mg/kg)	
	S6449	S6450
	A	B
PHOSPHORUS (mg/kg) Bray 1	14.00	5.00
POTASSIUM (mg/kg)	494.00	34.00
CALCIUM (mg/kg)	2656.00	1127.00

MAGNESIUM (mg/kg)	1500.00	275.00
EXCHANGEABLE ALUMINIUM INDEX (me%)	0.02	0.02
TOTAL NITROGEN (mg/kg)	1414.00	98.00
CHLORIDE (mg/kg)	184.80	693.60
SULPHUR (mg/kg)	427.50	322.50
BORON (mg/kg)	0.80	0.30
MOLYBDENUM (mg/kg)	0.58	0.48
ZINC (mg/kg)	63.21	6.58
IRON (mg/kg)	75.65	153.40
MANGANESE (mg/kg)	235.60	15.71
COPPER (mg/kg)	6.87	5.74

13.5 Water quality

The natural cycles are largely masked by input of mining and industrial waste water with high pollutant and suspensoid loads.

According to the Waterlab report (1994) the water quality of the Blesbokspruit has improved over the past five years to a point where it is acceptable for aquatic life.

13.6 Depth, fluctuations and permanence

The width of the river varies in winter from about 5 to 650 m, while the measured depth of the main channel is around 1,5 m. Little is known about fluctuations. Due to the sewage inlets into the catchment, the water level is higher during winter months than it would have been under pristine conditions.

13.7 Tidal variations

Not applicable.

13.8 Catchment area

The Blesbokspruit catchment is situated in the urbanized, mining and agricultural East Rand, and covers about 60 km².

13.9 Downstream area

Downstream from the site the vlei becomes a typical Highveld river which turns into the Holspruit which flows into the Suikerbosrand River, which in turn flows into the Vaal River at Vereeniging.

13.10 Climate

The average annual rainfall is 670 mm recorded over a period of 31 years (Madden, 1987). Hailstorms are not uncommon during summer. Snow falls on rare occasions. One of the heaviest snow falls was recorded in July 1964 when a depth of 200 mm was measured and the area was blanketed for three days. Temperatures vary from -10° C in winter to 35° C in summer. Frost occurs from April through to October. During the coldest months of June and July, ice can occur on the shallow open water.

14. ECOLOGICAL FEATURES

See 12 (Overview of Site). Two main habitats can be distinguished, these being a vlei which is bordered by open grassland. The vlei is dominated by *Phragmites communis* while the grassland consist of species such as *Themeda triandra*, *Chloris* species, *Cynodon dactylon* and *Eragrostis* species.

Apart from the narrow fringe of natural grassland along the vlei, very little of the adjacent original plant communities remain. The vlei and fringe of grassland are bordered mainly by cultivated lands, as well as to a lesser extent, mine heaps and urban development.

15. LAND TENURE

In 1971 an area of about 500 ha of mainly vlei and grassland at the southern end of the vlei was donated by Marievale Consolidated Mines to the Transvaal Division of

Nature Conservation (now called the Gauteng Nature Conservation) to be managed as a Bird Sanctuary. A further 385 ha was donated in 1976. With additional land purchased by the Transvaal Provincial Administration, the total area of the Marievale Bird Sanctuary is at present approximately 1 000 ha and is about 7,4 km long.

Since the Sanctuary was officially proclaimed in 1978, further areas of 860 ha of the farm Groot valley, at the northern end, have been protected by the Anglo American Group and the Nature Conservation Division. The total length of the Blesbokspruit now under protection is roughly 20 km.

15.1 Legal status

A portion of 500 ha was donated to the Provincial Administration by Marievale Consolidated mines more than a decade ago. The rest of the 1800 ha area is hired from African & European Investment Company since 1 January 1985 at a rate of R 1.00 per year for a contract period of 30 years.

16. CONSERVATION MEASURES TAKEN

- Fencing
- Patrolling - game guards
- Fires and controlled burns
- Grass cutting for roads and firebreaks
- Grading roads and firebreaks
- Use of herbicide on vlei vegetation and for fence protection / will probably be stopped
- Control of water levels - Ergo causeway on Daggafontein with sluice gate
- Use of vlei water for irrigation
- Eradication of unwanted alien plants and animals (cats and dogs)

16.1 Management plans

A management plan has been compiled by Nel (1990). The following recommendations have been made:

- a) The current blesbuck and reedbuck populations should be managed to reach optimum population sizes.

- b) Burchells zebra should be reintroduced to the northern area. This combined with the blesbuck, will have a positive effect on the diversity of the vlei vegetation as well as on the diversity of birds.
- c) The central area should be grazed by cattle of neighbouring farmers on a experimental basis for the same reason as the Burchells zebra in the northern area.

The recommendations in paragraph b) and c) have not been implemented yet.

Further management proposals were made by Swart *et al al* al. (1991?).

A workshop with all interested parties is planned during October 1995 to finalize a management strategy for Marievale Bird Sanctuary.

17. CONSERVATION MEASURES PROPOSED BUT NOT YET IMPLEMENTED

- Controlled burns of vlei vegetation and surrounding wetlands
- Patrols - security
- Grass cutting to protect fences and for roads
- Manipulating vlei vegetation using herbicides and fire
- Game population management
- Eradication of alien plants and animals
- Manipulating water levels
- Creation of suitable loafing sites for ducks and geese
- Hides for tourists (visitors)
- Rehabilitation of disturbed areas (quarry pits) and removal of rubble and old fences
- Law enforcement and anti-poaching
- Upgrading of roads

18. CURRENT LAND USE

(a) Ramsar site :

(b) Surroundings and catchment :

- Gold mines and recycling slimes dams from old gold

- mines.
- Urban townships on the west (Bakerton and Daggafontein extension).
 - Maize, wheat, vegetable and cattle and sheep farms on the east.

18.1 Resource utilization

Consumptive utilization

A bird shoot is organised by Anglo American (Dr Smuts), on a regular basis on the area adjacent to the reserve (north of the reserve).

Water is suitable for agricultural use according to the Waterlab report.

No other consumptive utilisation is taking place although the previous regional ecologist proposed that grazing be made available for neighbouring cattle owners on a controlled basis according to an approved grazing system that will allow a grazing rest for the veld. on the area adjacent to the reserve (north of the reserve).

Non-consumptive utilisation

Four bird hides for bird watching already exist and are utilised by local bird clubs and societies.

19. DISTURBANCES AND THREATS INCLUDING CHANGES IN LAND USE AND MAJOR DEVELOPMENT PROJECTS

Development threats

Development threats are evident in the presence of several power lines, telephone lines and quarrying of old mine dumps through aqua mining and excavation activities for building material adjacent to the reserve by Readymix Materials Company.

Exotics

Occasional population explosions of exotic *Azolla* ferns in the water are also a threat to reckon with.

Security

The nature conservator in charge of the reserve also reported a border fence that needs repair with certain

portions being stolen.

Other threads include

- Mining pollution
- Industrial effluent and sewerage effluent
- Excessive abstraction of water
- Disturbance by proposed road crossings
- Urban encroachment
- Power line casualties (birds)
- Quarry pits
- Canals to channel water into the vlei
- Low flying aircraft

19.1 Present threats

20. HYDROLOGICAL AND BIOPHYSICAL FEATURES

Not available.

21. SOCIAL AND CULTURAL VALUES

Before mining started in the area in the early 1930's the Blesbokspruit flowed unrestricted through a broad, grassy valley. A single bridge, build in 1899-1900 linked the town of Springs to the farm Vlakfontein. By the mid 1940's mines in the area were in full production. Residential areas had been established for the mine employees and thousands of trees and shrubs planted. Several roads built on embankments crossing the spruit had dammed up large areas of shallow open water which provided habitat for beds of *Phragmites* and *Typha*.

Culturally hunting has been popular along the spruit. The mining companies owning land along the spruit afforded some protection to the wildlife of the area. Both on Marievale and Daggafontein annual duck shoots were held. In 1963 Marievale prohibited shooting on their property.

22. NOTEWORTHY FAUNA

The Blesbokspruit supports significant numbers of waterfowl, including up to 4 000 yellow-billed duck, *Anas erythrorhyncha* and 1 000 spur-winged goose *Plectropterus gambensis* in the dry season, when levels are maintained artificially at a high level. The high-productivity water provides food for greater flamingo *Phoenicopterus ruber*, and lesser flamingo *Phoeniconaias minor*, which are South African Red Data Book Species. Other notable birds include avocet *Recurvirostra avosetta*, purple heron *Ardea purpurata*, spoonbill *Platalea alba*, glossy ibis *Plegadis falcinellus* and yellow-billed stork *Mycteria ibis*. African marsh harrier *Circus ranivorus*, which has been displaced from much of the veld, maintains a strong population here. There are at least three heron roosts with a total of over 3 500 birds.

Increasing urbanization and industrialization in the central Gauteng reduce the number of sites available to the local fauna and flora. The Blesbokspruit supports a variety of fish, amphibians, reptiles, crustaceans and rodents. Spotted-necked otters *Lutra maculicollis*, water mongoose *Atilax palidinosus* and many larger birds depend on these animals for their food.

The reedbuck *Redunca arundinum* regarded as uncommon in South Africa, has also been recorded here. See attached list for other fauna recorded.

22.1 Species counts

The large ungulate numbers are counted irregularly by drive census (1991) and night counts (1995). The results according to Nel (1991) and Pretorius (pers. comm. 1995) are as follow:

Year	91	95
Blesbuck	15	28
Reedbuck	10	21
Steenbok	common	
Grey duiker	common	

Due to irregular count methods no trend could be determined. The 1995 count was done after a veld fire so

that visibility was better.

23. NOTEWORTHY FLORA

The Blesbokspruit is situated in the Cymbopogon-Themeda veld (Acocks veld type no 48). This veld type merges with the Bankenveld and is a spare, tufted sourveld. The aquatic habitat consists mostly of *Phragmites australis*, bulrushes *Typha latifolia* and sedges which cover 90% of the water surface. These wetlands cover an area approximately 85% of the Marievale Bird Sanctuary. The remaining 15% is a grassland which is broadly classified as Bankenveld.

A wide variety of flowering plants occur. A few of the more spectacular are the Orange River lily *Crinum bulbispermum*, plough breaker *Erythrina zeyheri* and *Aloe ecklonis*.

24. SCIENTIFIC RESEARCH AND FACILITIES

The Blesbokspruit, lying as it does less than an hour's drive from two of South Africa's largest universities, is an excellent system on which a variety of research can be undertaken. Viljoen (1974) has demonstrated the capability of reedbeds to remove significant quantities of heavy metal and suspended solids from the system over a distance of 20 km. Research into all aspects of management and conservation of the system to maintain its role as biological filter without altering its present diversity is not only possible, but highly desirable.

24.1 Projects in progress

No projects by Gauteng Nature Conservation.

24.2 Projects just completed

Title: Grootvlei mine: Hydrological and Flood line Investigation.
Researcher: WATES, MEIRING & BARNARD
Supervisor:
Duration: 1993

Title: Impact of the Blesbokspruit on the Natural Environment: Application of integrated water quality monitoring in the assessment of ecosystem health. Final Report.

Researcher: WATERLAB

Supervisor:

Duration: 1994

24.3 New findings

According to the Waterlab report (1994) the water quality of the Blesbokspruit has improved over the past Five years to a point where it is acceptable for aquatic life.

24.4 Proposed new projects

25. CURRENT CONSERVATION EDUCATION

Situated in the highly populated East Rand, the spruit offers outstanding environmental education possibilities. The popularity of the Marievale Bird Sanctuary, at the southern end of the vlei, attests to its actual and potential recreation and education value.

A number of projects at honours level and above have and are being carried out along the spruit. Results from such projects can be incorporated into environmental education programmes.

26. RECREATION AND TOURISM

The present Marievale Nature Reserve attracts numerous visitors. Picnic facilities and bird watching hides cater for the needs of the public. Similar developments are envisaged on Groot valley at the northern end of the vlei.

An annual duck shoot is held on Daggafontein at the discretion of the owners and under strict control.

The vlei forms part of the proposed Blesbok hiking trail, which is to be developed by various municipalities on the East Rand.

27. MANAGEMENT AUTHORITY

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28. JURISDICTION

Applicable legislation:

Nature Conservation Ordinance (Ordinance 12 of 1983)
Environmental Conservation Act, 1989
Water Act, 1956

29. REFERENCES

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MADDEN, ST. 1987. Marievale Bird Sanctuary. Bokmakierie 39: 102-104.

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VILJOEN, FC. 1974. Die rol van versteuring deur minerale en organiese stowwe op faunistuiese toestande van die riviere in die Witwatersrand gebied van die Vaalriviersisteam. PhD Proefskrif. Randse Afrikaanse Universiteit.

30. REASONS FOR INCLUSION

Criteria applicable: 1(c), 2(a) and 3(b).

30.1 Conservation importance

31. OUTLINE MAP OF SITE

Attached.