

NYLSVLEY NATURE RESERVE

SOUTH AFRICA

Information sheet for the site designated to the

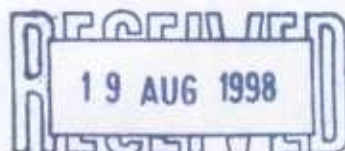
List of Wetlands of International Importance

in terms of the

Convention on Wetlands of International Importance especially as Waterfowl Habitat

*South African Wetlands Conservation Programme
Document No 24/21/3/3/3/17 (1998)*

Department of Environmental Affairs and Tourism
Private Bag X447
PRETORIA 0001
South Africa



NYLSVLEY NATURE RESERVE: RAMSAR DATA SHEET

1. DATE OF COMPILATION

11 July 1997

2. COUNTRY

Republic of South Africa

3. NAME OF WETLAND

Nylsvley Nature Reserve

4. GEOGRAPHICAL CO_ORDINATES

24° 39' S 28° 42' E

5. ALTITUDE

The altitude of Nylsvley Nature Reserve ranges between 1080 m and 1154 m above sea level with an average altitude of 1100 m.

6. AREA

Nylsvley Nature Reserve comprises 3970 ha whilst the floodplain / wetland area is approximately 500 ha.

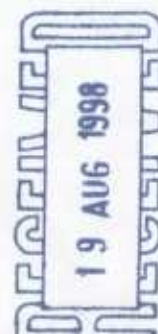
7. OVERVIEW

Nylsvley Nature Reserve forms part of the largest floodplain vlei in South Africa (Noble & Hemens, 1978). It is well known for its exceptional avifaunal diversity. The bird species list for the reserve includes 370 species. 102 Waterfowl species have been recorded on this floodplain. The endangered Roan antelope (*Hippotragus equinus*) and rare Tsessebe (*Damaliscus lunatus*) also occur on this reserve.

8. WETLAND TYPE

It is identified as an **inland wetland** and is classified as a floodplain vlei. Under the heading inland wetland, Nylsvley most closely approximates riverine floodplains, including flooded river basins, seasonally flooded grassland, savanna and palm savanna. The dominant wetland type is a seasonal river associated with a grassland floodplain.

- (N) Seasonal/intermittent/irregular rivers / streams / creeks.
(Tp) Permanent freshwater marshes/pools; ponds (below 8 ha),



marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.
(Ts) Seasonal/intermittent freshwater marshes/pools on inorganic soil; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.*

* As appropriate, includes: floodplain wetlands such as seasonally inundated grassland (including natural wet meadows), shrublands, woodlands or forests.

9. RAMSAR CRITERIA

To be proposed as a Ramsar site the wetland needs to comply with at least one of the 11 listed criteria. Nylsvley Nature Reserve qualifies to be listed because it complies with eight of the criteria as follows: 1a, 1d, 2a, 2b, 2c, 2d, 3b, 3c.

10. OUTLINE MAP OF SITE

See Figure 1 [Map - Dept. of Agriculture (GIS section), photographs - C. Haskins]

11. COMPILERS

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12. JUSTIFICATION OF THE CRITERIA SELECTED UNDER POINT 9

Criteria for wetlands:

Criteria 1(a)

It is a particularly good representative example of a natural or near-natural wetland, characteristic of the appropriate biogeographical region.

Motivation

Nylsvley Nature Reserve forms part of the largest floodplain vlei in South Africa. It is well known for its exceptional avifaunal diversity. 102 Waterfowl species have been recorded on this floodplain. The endangered Roan antelope (*Hippotragus equinus*) occur on this

reserve.

The floodplain acts as a sink and is not flushed by floods as other hydrological systems are. On the other hand the floodplain (specifically permanently wet areas) is able to absorb and neutralize a certain level of pollution without adverse effects.

Criteria 1(d)

It is an example of a specific type of wetland, rare or unusual in the appropriate biogeographical region.

Motivation

Nylsvley Nature Reserve forms part of the largest floodplain vlei in South Africa.

Criteria for plants and animals:

Criteria 2(a)

It supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species,

Motivation

Within the reserve eight South African Red Data listed waterfowl species have been recorded breeding. They are: Rufousbellied Heron (*Butorides rufiventris*), Little Bittern (*Ixobrychus minutus*), Dwarf Bittern (*Ixobrychus sturmi*), Bittern (*Botaurus stellaris*), Pygmy Goose (*Nettapus auritus*), Baillon's Crake (*Porzana pusilla*), Striped Crake (*Aenigmatolimnas marginalis*) and Black Stork (*Ciconia nigra*). In addition, this is the only site in South Africa where Rufousbellied Heron has been known to breed. The Striped Crake has not been recorded anywhere in the country besides on Nylsvley Nature Reserve (Tarboton, 1987).

Breeding of endangered Roan antelope which use the floodplain extensively is another of the conservation priorities for the reserve.

Criteria 2(b)

It is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its fauna and flora,

Motivation

Of particular interest are the stands of wild rice, *Oryza longistaminata*. The reserve and parts of the floodplain are the only recorded localities for this plant species in South Africa (Gibbs Russell *et al.*, 1994).

Breeding of endangered Roan antelope which use the floodplain extensively is another of the conservation priorities for the reserve.

Criteria 2(c)

It is of special value as the habitat of plants or animals at a critical stage of their biological cycles (especially breeding conditions for waterfowl)

Motivation

During good rain seasons the floodplain becomes a hipe of activity, the best estimate for water bird numbers on the floodplain in wet years is approximately 80 000 (Tarboton, 1987). The floodplain also play an important role for frogs which breed in their thousand after good rains. An influx of fish after a flood is often seen. It is estimated that 300 to 600 ton fish breeds on the floodplain, depending on the extend of the flood.

Criteria 2(d)

It is of special value for its endemic plant or animal species or communities.

Motivation

Within the floodplain as a whole there is at least one rare and endemic (to old Transvaal) plant, *Ceropegia stentiae* (Asclepiadaceae)

Criteria for waterfowl:**Criteria 3(b)**

It regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity,

Motivation

During a good rain seasons the floodplain becomes a hipe of activity, the best estimate for water bird numbers on the floodplain in wet years is approximately 80 000 (Tarboton, 1987). This is the sum for the whole floodplains and was calculated as follows: 43 000 bitterns, crakes and rails, 12 000 egrets and herons (17 species), 19 000 ducks (17 species) plus the numbers of other groups such as cormorants, darters, spoonbills and storks.

Criteria 3(c)

It regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl.

Motivation

This is the only site in South Africa where Rufousbellied Heron has been known to breed. The floodplain also supports more than 1% of the populations of Great white egrets, Squacco herons, Blackheaded heron and Black crowned night heron in South Africa (Tarboton per com).

13. GENERAL LOCATION

Nylsvley Nature Reserve is situated 12 km south of the town of Naboomspruit in the Northern Province of the Republic of South Africa. The reserve forms part of a larger floodplain system extending from Middelfontein (west of Nylstroom) in the south-west to Moorddrift (near Potgietersrus) in the north-east. The reserve is located in the upper reaches of the Nyl River floodplain.

14. PHYSICAL FEATURES

14.1 Geology and geomorphology

To understand the geology and geomorphology of Nylsvley Nature Reserve it is important to include information for the floodplain as well. The sandstones of the Waterberg Group are found in the upper reaches of the floodplain. Rooiberg felsites underlie the middle reaches and the lower reaches are underlain by Karoo basalts. This geological mosaic is overlain by approximately 15 m of alluvial soils (Higgins & Rogers, 1993). The topography is gently sloping, 1:1750 m river gradient (Rogers & Higgins, 1993), with a few rocky outcrops. The reserve is situated along the interface of the Waterberg plateau (to the west and north-west) and the Springbok flats (to the south and east). The geology is thus complex with representation in the Bushveld complex, Waterberg sandstones, Karoo sandstones and Rooiberg lavas (felsites), giving rise to 17 soil forms and 34 soil series (Harmse, 1977). Two noteworthy features on the reserve are the hard plinthite ('laterite', derived from the felsites) and deep, heavy clay soils ('turf').

14.2 Origins

It is a natural floodplain subjected to seasonal flooding of varying intensities. Flooding is of erratic nature with alternating wetter and drier periods. The floodplain and the reserve have been altered by dams, dykes, weirs, road and rail culverts.

14.3 Hydrology

The catchment area, 600 km² (Tarboton, 1987) to 800 km², is the south eastern fringe of the Waterberg plateau. The sub_catchments feeding the floodplain are those of the Groot Nyl, Klein Nyl, Olifantspruit, Modderloop / Rasloop, Middelfonteinspruit, Hessie_se_Water, De Wet Zyn Loop, Bad se Loop, Tobiasspruit, Andriesspruit and Kootjie se Loop. The flow in these streams is strongly seasonal with peak flows in the wet summer months dropping to minimum flows at the peak of the dry season (September / October). The storage capacity of the sub_catchments varies from one to the other with some having a greater storage capacity than others. For example, the Olifantspruit sporadically delivers large volumes of water during high rainfall events as there is very little storage capacity due to the rocky substrate and steep-sided valleys.

The Klein Nyl is dammed (Donkerpoort dam - $2.38 \times 10^6 \text{ m}^3$ capacity). The Groot Nyl and Olifantspruit provide most of the streamflow to the reserve and the floodplain. Precipitation, ground-water storage and water abstraction are the primary factors which influence the water volume reaching the floodplain.

The entire floodplain is 24 250 ha (including hydromorphic grasslands and sodic sites) and the Nyl River is the main drainage channel. During dry spells the floodplain dries completely and water is available only in permanent pools (refuge areas) in the channel. The water depth varies according to the type of flooding that occurs but seldom exceeds one metre.

Table 1. Flooding events of the Nyl River as classified by Tarboton (1990).

Flood size	Total annual flow ($\times 10^6 \text{ m}^3$)	Inundation to (farm name)
No flood	< 15	
Small	15 - 20	Vogelfontein
Small / Medium	20 - 25	
Medium	25 - 30	Mosdene
Medium / Large	30 - 35	
Large	> 35	Vaalkop

Principal uses of water in the Nyl River system are crop irrigation and household use. An estimated 11 million m^3 per annum are required to irrigate 1 525 ha of crop lands in the Nyl catchment (Theron *et al.*, 1992). There are approximately 2 000 boreholes and in excess of 300 dams in the Nyl River system (Marneweck *pers. comm.*¹). Nylstroom receives almost all of its water from the Roodeplaat dam (100 km south, Pretoria) and Naboomspruit uses approximately 0.75 million m^3 per annum from boreholes on the Nyl River floodplain and surrounding areas. The Centre for Water in the Environment (University of Witwatersrand) in collaboration with Bill Pittman of Stewart Scott Consulting Engineers and with funding from the Department of Water Affairs and Forestry are currently developing a hydrologic and hydraulic model for the Nyl River floodplain to investigate various water-use issues.

14.4 Soil type and chemistry

On Nylsvley Nature Reserve alone, 17 soil forms (classified according

to the South African National Soil Classification System, Macvicar *et al.*, 1977) and, within them, 34 soil series have been identified and mapped (Harmse, 1977). On a broader scale Scholes and Walker (1993) divided the soils into 9 major soil groups as follows:

- shallow soils derived from felsite
- deeper soils derived from felsite
- alluvium
- sodium-affected duplex soils
- vertisols derived from basalt
- shallow sandy soils derived from sandstone
- deeper sandy soils derived from sandstone
- deep sandy soils enriched with nutrients
- sandy soils with alluvial horizon

At an even broader level three mapping units occur:

1. Black and red montmorillonitic clays - red clays contain less calcium carbonate, lower phosphorus and have higher percentages of iron and aluminium oxides than black clays. Black clays are confined to the shallow, poorly drained depressions of the floodplain. (Gary Marneweck, Wetlands consultant, Strategic Environmental Focus, Pretoria)
2. Lithosols of the scattered sandstone outcrops (Maroelakop and Stemmerskop - Fig. 1)
3. Savanna soils of red, yellow and grey ferrisallitic sands (upland situation) and loams of the bottomlands.

14.5 Water quality

The indications, at present, are that water entering the floodplain is of an acceptable quality. It should, however, be monitored and maintained within limits that will ensure the survival of the floodplain organisms. A decrease in water quality through water pollution of any sort could be critical as the floodplain acts as a sink and is not flushed by floods as other hydrological systems are. On the other hand the floodplain (specifically permanently wet areas) is able to absorb and neutralize a certain level of pollution without adverse effects.

14.6 Depth, fluctuations and permanence

When flooded the depth of the floodplain rarely exceeds one metre. Flooding categories, according to Tarboton, have been mentioned in the section on hydrology (13.3).

Table 2. Higgins *et al.* (1996) described three flooding events according to the presence of water in three landscape units.

Flood size	Landscape unit	Frequency	Permanence
Small	Channel zone flood	7 in 10 years	3 - 4 months
Medium	Floodplain zone flood	4 in 10 years	50 days
Large	Hydromorphic zone	3 in 10 years	> 50 days

flood

14.7 Catchment area

600 km² (Tarboton, 1987) to 800 km²

14.8 Downstream area

The floodplain is approximately 70 km long with an average width of 2 km (max. width 6 km). Nylsvley Nature Reserve is situated in the upper reaches of the floodplain and comprises approximately 500 ha of floodplain.

14.9 Climate

Situated in the summer rainfall region, the floodplain and catchment receive rains during the hot summer months and experience cool dry winters. The rainfall over the entire system is highly variable in time, space and intensity and varies between 740 mm / annum in the west and 600 mm / annum in the east. The 69-year mean annual rainfall at Nylsvley Nature Reserve is 623 mm with an annual coefficient of variation of 24% (Frost, 1987). Mean annual temperature is 19°C (Scholes & Walker, 1993). Maximum daily temperature at Nylsvley Nature Reserve range from a mean of 29,2 °C in December/January to 21,0 °C in June/July. Minimum daily temperatures varies between 16,8 °C in December/January and 4,0 °C in June/July.

15. HYDROLOGICAL VALUE

The Nyl River floodplain is a wetland of international importance which owes its existence to the combination of its geomorphology and the variability of the hydrological regimes of its sub-catchments. It is an extremely dynamic system which requires both wet and dry periods to maintain its complex ecology. The floodplain and catchment represent a diverse and complete ecosystem whose components are dependent on each other to maintain the integrity of the system. Groundwater recharge and discharge have not been adequately investigated to justify comment. Due to its location at the top end of the floodplain, maintaining the integrity and function of the reserve's wetland will benefit downstream water users. The reserve also contributes to sediment trapping, maintaining water quality and fulfilling feeding and breeding requirements of a high diversity of waterfowl.

16. ECOLOGICAL FEATURES

According to Low & Rebelo (1996) the reserve comprises two broadscale vegetation types, namely Mixed Bushveld (#18) and Clay Thorn Bushveld (#14) which correspond with Acocks (1976) Mixed Bushveld and Sourish Mixed Bushveld and Springbok Flats Turf Thornveld respectively. Approximately 600 plants species have been

recorded for the reserve (Scholes & Walker, 1993). The vegetation communities are many and varied due to the range of soil types and water regime. Various studies have attempted to dissect communities and vegetation types at various levels, as follows:

Coetzee *et al.* (1977) distinguished four broad groups of communities, namely:

Grassland and broad-leaved communities on elevated sandstone and felsite areas

Microphyllous thorn savanna on termite mounds and the flat bottomlands excluding self-mulching, vertic soils

A bottomland community on self-mulching, vertic soils

Secondary grassland-thorn savanna of abandoned settlements

These communities and species representation are dealt with in more detail by Coetzee *et al.* (1977).

At another level Scholes and Walker (1993) distinguished nine vegetation types from the vegetation mapping of Coetzee *et al.* (1977) as follows:

Burkea africana savanna

Diplorhynchus condylocarpon savanna

Combretum spp. savanna

Acacia tortilis savanna

Old village sites

Acacia karoo savanna

Floodplain grasslands

Grasslands on vertic soils

Seepine grassland

The terrestrial vegetation and ecology have been extensively researched but it is only more recently that effort has been directed at the aquatic and semi-terrestrial vegetation within the reserve.

Higgins *et al.* (1996) divided the floodplain into landscape units based on lateral, vertical and longitudinal gradients. Vegetation changes along these gradients in response to flooding. The landscape units are as follows:

Channel - floating leaved e.g. *Nymphaea lotus* and *Ludwigia stolonifera* and submerged aquatic species, e.g. *Ceratophyllum demersum* and *Potamogeton thunbergii*

Channel levee - well drained sites for riparian tree species, otherwise nearly imperceptible, e.g. *Combretum erythrophyllum* and *Polygonum kitaibelianum*.

Floodplain - approximately 35 plant species and very important for aquatic bird habitat and foraging, e.g. *Oryza longistaminata*, *Paspalidium obtusifolium*, and *Panicum schinzii*.

Backflooded grasslands - termite mounds allow for establishment of woody species, e.g. *Cyperus fastigiatus*, *Cynodon*

dactylon, *Setaria sphacelata* and *Bothriochloa bladhii*.

Sodic islands - woody community on the periphery and grassland in the central pan, e.g. *Acacia karoo*, *Carissa bispinosa* and *Chloris virgata*.

Hydromorphic grasslands - represent the ecotone between floodplain and terrestrial savanna, provide a conduit for movement of organisms between savanna and floodplain, e.g. *Setaria sphacelata* and *Themeda triandra*.

Looking more closely at the aquatic vegetation Bailey (1990) classified six main communities in terms of dominant species and rank along the elevation profile from wettest to driest as follows :

Submerged aquatic community dominated by *Ceratophyllum demersum* and *Potamogeton thunbergii* (elevation 0 - 1 m)

Floating leaved community with *Nymphaea lotus* and *Ludwigia stolonifera* as dominant species (0.5 - 1 m)

Wild rice community with the grasses *Oryza longistaminata* and *Leersia hexandra* being dominant (0.5 - 1.5 m)

Reed and sedge communities dominated by species such as *Phragmites mauritianus* and *Cyperus fastigiatus* occurring in patches on the floodplain (0.5 - 1.0 m)

Floodplain grasslands dominated by species such as *Paspalum serobiculatum* and *Panicum shinzii* at lower elevations (1.5 - 1.8 m) and *Cynodon dactylon* at higher elevations (1.8 - 2.0 m)

Semi-terrestrial grasslands dominated by terrestrial grasses such as *Bothriochloa insculpta* and *Themeda triandra*, but contain many more species (elevation 1.8 - 2.5 m).

17. NOTEWORTHY FLORA

Within the reserve a diversity of communities with more than 600 plants species is represented. Of particular interest are the stands of wild rice, *Oryza longistaminata*. The reserve and parts of the floodplain are the only recorded localities for this plant species in South Africa (Gibbs Russell *et al.*, 1994). See also Ecological Features (section 14). Within the floodplain as a whole there is at least one rare and endemic (to Transvaal) plant, *Ceropegia stentiae* (Asclepiadaceae).

18. NOTEWORTHY FAUNA

Within the reserve eight South African Red Data listed waterfowl species have been recorded breeding. They are: Rufousbellied Heron (*Butorides rufiventris*), Little Bittern (*Ixobrychus minutus*), Dwarf Bittern (*Ixobrychus sturmi*), Bittern (*Botaurus stellaris*), Pygmy Goose (*Nettapus auritus*), Baillon's Crake (*Porzana pusilla*), Striped Crake (*Aenigmatolimnas marginalis*) and Black Stork (*Ciconia nigra*). In addition, this is the only site in South Africa where Rufousbellied Heron has been known to breed. The Striped Crake has not been

recorded anywhere in the country besides on Nylsvley Nature Reserve (Tarboton, 1987). The latest bird list for Nylsvley comprises 370 species (Appendix A).

Looking to the floodplain as a whole some interesting facts emerge. For example, the Streakybreasted Flufftail has only been recorded on the Nyl floodplain and nowhere else in the country. Of the 102 waterfowl species recorded on the floodplain, 58 species are known to breed on the floodplain, more than on any other South African wetland. Twenty three of the waterfowl species are Red Data listed (Brooke, 1984) and eight of these are known to breed here (Tarboton, 1994). The number of bird species recorded on the entire floodplain is 412. The latest bird atlas numbers for the quarter degree square including Nylsvley Nature Reserve yielded 426 species, almost half the total number of bird species in South Africa. The best estimate for water bird numbers on the floodplain in wet years is approximately 80 000 (Tarboton, 1987).

Breeding of endangered Roan antelope which use the floodplain extensively is another of the conservation priorities for the reserve. In total 79 mammal species (Appendix B) have been recorded in the reserve (Bronner, *pers. comm.*¹).

Kleynhans (1991) recorded 10 fish species from the floodplain (from Nylsvley downstream) (Appendix C).

Jacobsen (1977) has dealt with the herpetofauna for the reserve and recorded a total of 132 (23 lizards, 1 Amphisbaenia, 17 frogs and 29 snakes). Of these 11 amphibian species utilize the floodplain to a greater or lesser extent (Jacobsen, 1991).

19. SOCIAL AND CULTURAL VALUES

Nylsvley Nature Reserve is regarded as one of the premier birdwatching localities in the country. Most of the 10 000 visitors who visit the reserve each year are birdwatchers. A group camp and camp site provide outdoor recreation facilities for tourists. Friends of Nylsvley (a special interest group of the Wildlife and Environment Society of S.A.) promote conservation and environmental education by hosting natural history courses at the reserve.

Scientific research is also an important component of the reserve, making Nylsvley Nature Reserve one of the most intensively studied sites in the world. The Savanna Ecosystem Project (1974-1989) included scientists from all disciplines whose aims were to develop a greater understanding of processes in savanna ecosystem function. Various international scientists still conduct scientific research in the

reserve and surrounding areas of the floodplain. An Foundation for Research Development Special Programme entitled "Wetlands as Functional Units of the Landscape (1990 - 1994)" focussed ecological research on wetland vegetation and the relationship with the hydrological system.

Signs of previous human occupation of the area have been discovered. Some of the earliest hominid relics (*Australopithecus africanus*, dated 2-3 My BP) were discovered 60 km to the north at Makapansgat (Brain, 1981). Stone implements from the Middle and Late Stone Age are widespread in the Nylsvley region (Scholes & Walker, 1993). At nearby Witkop and Klippotgat simple paintings have been found in sandstone shelters (Tarboton, 1987). Archeological sites at Nylsvley show Iron Age people having been present. The style of pottery and ¹⁴C dating of charcoal excavated in the area suggest that the settlements belonged to the Tswana culture of the Middle Iron Age. In the early nineteenth century a militant offshoot of the Zulus, the Matabele established a large village 100 km south of Nylsvley. The first influx of white settlers arrived in the Nylsvley area in 1838 (Scholes & Walker, 1993).

20. LAND TENURE / OWNERSHIP

The Northern Province Chief Directorate Environmental Affairs manages the Nylsvley Nature Reserve. The remainder of the floodplain is privately owned.

21. CURRENT LAND USE

a) Proposed Ramsar site

Land use on the reserve is primarily conservation-orientated with tourism (birdwatching, walking, etc.) and environmental education also being important activities. No threat from human activities exists on the site itself.

b) Surroundings and catchment

The land use of the surrounding areas includes various forms of agriculture and cattle farming. Game farming has also emerged as a fast growing practice. The principle uses of water are crop irrigation and household use (Theron *et al.*, 1992). An estimated 11 million m³ per year is used to irrigate 1 525 ha crop lands in the Nyl catchment. Forestry plantations are limited to 180 ha in the catchment area but a further threat is alien vegetation in the water courses. Approximately 200 ha of *Eucalyptus* species and *Populus canescens* are currently choking the subcatchments of the Nyl River.

There are two urban centres in the Nyl River system - Nylstroom / Phagameng and Naboomspruit / Mogopong whose populations are

approximately 22 000 and 13 000 respectively. Nylstroom receives most of its water requirements via a pipeline from Roodeplaat dam, Pretoria. The only impact of water loss from the system will be when the Donkerpoort dam (2.38 million m³ capacity), Nylstroom's original water source, refills at the beginning of the wet season. Naboomspruit receives some water (approximately 0.5 million m³) from the Welgevonden (Frikkie Geysler) dam on the Sterk River, which is **not** one of the Nyl tributaries. The balance of the water required is provided by boreholes in the Nyl river (approximately 0.75 million m³ per annum). The use of boreholes by the Naboomspruit municipality negatively affects downstream floodplain residents but does not influence the proposed Ramsar site as such. Current water requirement growth rates for the urban centres are in the region of 2.5%.

22. DISTURBANCES AND THREATS, CHANGES IN LAND USE AND MAJOR DEVELOPMENT PROJECTS

Threats to the floodplain are mainly external with pressure on the system arising from water abstraction and agricultural activities. Thus far the floodplain has been modified through the construction of weirs, dams, levees and diversion structures. The construction of numerous impoundments in the catchment have, in places, altered the character of the tributaries to the detriment of the overall hydrological regime.

The proposed siting of a dam on the Olifantspruit to provide water for the municipality of Nylstroom was stopped after an Integrated Environmental Management procedure was completed in the early 1990's. Instead a pipeline from the Roodeplaat dam some 100 km south of the floodplain is currently providing water for Nylstroom.

It is therefore essential that any further development in the catchment and on the floodplain is carefully evaluated and monitored to ensure that this important natural area is not irreparably impacted by further water regulation projects. There is no doubt that the Nyl River floodplain is a national asset that must be maintained in as near pristine a state as possible.

23. CONSERVATION MEASURES TAKEN

Of the 3970 ha protected within Nylsvley Nature Reserve, approximately 500 ha comprises floodplain. The nearby farm of Mosdene, comprising 4 972 ha, is a privately-owned nature reserve and Natural Heritage Site. The owner of Mosdene has recently (May 1997) removed all cattle from the farm and hopes to collaborate with others in a conservancy structure.

A provisional management plan for Nylsvley Nature Reserve (Appendix

D) has been drafted and is currently being implemented.

24. CONSERVATION MEASURES PROPOSED

In April 1994 a portion (850 ha) of the adjacent farm, Vogelfontein, was purchased and added to the reserve. A proposal by the Department of Environmental Affairs (29/11/95) for the USA-SA Binational Commission was compiled for the acquisition of funds needed for the expansion of the reserve to include the farms Mosdene, Vogelfontein sections 1, 2, 3 and 4 and Weltevreden section 3 (totalling 7 238 ha, see Topo-cadstral 1: 50 000 map - 2428 DA). While nothing resulted from this proposal there are plans by the landowners on these properties and others to create a conserved natural area near, possibly adjacent, to Nylsvley. This venture, if successful, will include approximately 1 800 ha of floodplain. Another private nature reserve of 367 ha on the farm Middlefontein (8 km upstream) is in the process of being established. Conservation on the floodplain is thus progressing favourably.

As of 22 April 1994 a Government Gazette notice (number 719, Article 9B of the Water Act No. 54, 1956) stipulates that the building of dams with a capacity greater than 10 000 m³ in the Nyl River system is prohibited, without a permit from the Department of Water Affairs and Forestry. Prior to April 1994 the limit was 250 000 m³. The Wildlife and Environment Society of South Africa, with funds from the World Wide Fund for Nature (S.A.), is currently involved in a project involving the removal of *Eucalyptus* species which have infested approximately 150 ha of the Groot Nyl tributary, an important tributary for water provision to the floodplain. In the past two years 32 ha have been cleared.

25. CURRENT SCIENTIFIC RESEARCH AND FACILITIES

Research facilities constructed for researchers involved in the Savanna Ecosystem Project are now used by the Centre for Water in the Environment (University of the Witwatersrand). Nylsvley Nature Reserve is one of the most intensively studied savanna sites in the world, having generated over one hundred scientific papers and reports, many postgraduate degrees and even a few books. For a recent synthesis of the published work consult Scholes and Walker (1993).

Current research includes the following projects:

The Hydrologic and Hydraulic Study of the Behaviour of the Nyl River Floodplain - funded by Dept. of Water Affairs and Forestry in collaboration with Bill Pittman of Stewart Scott Consulting Engineers and CWE (Kevin Rogers, Andrew Birkhead, Chris James and Andy

Fourie)

Plant responses to alterations in flooding regime: Community and life history approaches (Coetzee, M.A.S. (PhD, Botany, University of the Witwatersrand)

An ecosystem perspective of wild rice, *Oryza longistaminata*, on the Nyl River floodplain - (Marneweck, G.C. PhD, Botany, University of the Witwatersrand)

Nutrient reserve dynamics, foraging strategies, moult patterns and movements of White-faced Ducks in South Africa - Petrie, S.A. (PhD, Botany, University of the Witwatersrand)

Transferring scientific information from scientists to managers: Developing an interface for Nylsvley - Bestbier, R. (MSc, Botany, University of the Witwatersrand)

Change in vegetation characteristics in response to different disturbances on the Nyl River floodplain - Booij-Liewes, M. (MSc, Botany, University of the Witwatersrand)

Habitat requirements and management of Roan antelope (*Hippotragus equinix equinix*) in small conservation areas - Dörgeoloh, W.R. (PhD, Wildlife Management, University of Pretoria)

26. CURRENT CONSERVATION EDUCATION

Currently school groups as well as specialist interest groups like the Witwatersrand Bird Club and Friends of Nylsvley (affiliated to the Wildlife and Environment Society of South Africa) are catered for. Strategies involving the surrounding communities, including the farmers, are being developed through the Socio-Ecology section and Environmental Education section of the Chief Directorate Environmental Affairs (Northern Province).

27. CURRENT RECREATION AND TOURISM

A camp site, group camp, picnic site and three bird hides have been established (two more planned) on the reserve. Approximately 10 000 visitors per annum use the reserve at present.

28. JURISDICTION

Northern Province: Department of Agriculture, Land and Environment
Chief Directorate Environmental Affairs
PO Box 217
Pietersburg

0700
RSA

This site is a protected area in terms of Ordinance 12 of 1983, other legislation applicable to this site is Environmental Conservation Act, 1989 and the Water Act, 1956.

29. MANAGEMENT AUTHORITY

Northern Province: Department of Agriculture, Land and Environment
Chief Directorate Environmental Affairs
PO Box 217
Pietersburg
0700
RSA

30. REFERENCES

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