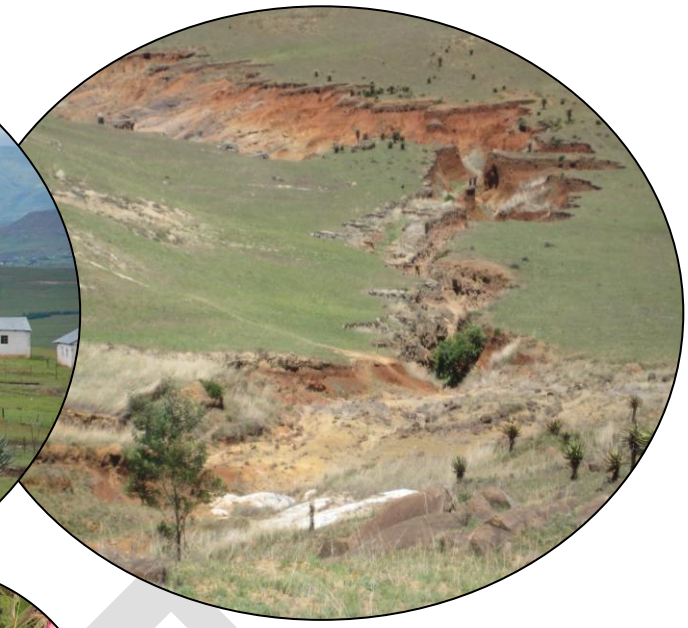








UMZIMVUBU CATCHMENT OVERVIEW

compiled by

ERS
environmental and rural solutions

in partnership with

CONSERVATION SOUTH AFRICA
Member of the CI Network

Draft 2 – dec 2011

Contents

ACRONYMS

ANDM	Alfred Nzo District Municipality
CC	Climate change
CI	Conservation SA
CSA	Conservation South Africa
CoGTA	Department of Cooperative Governance and Traditional Affairs
DAFF	Dept Agriculture, Fisheries and Forestry
DBSA	Development Bank of South Africa
DEA	Dept Environment Affairs
DEDEAT	Dept Economic Development, Environment Affairs & Tourism (provincial)
DRD&LR	Dept Rural Development and Agrarian reform (formerly Land Reform)
DWA	Dept Water Affairs
DM	District Municipality
ERS	Environmental & Rural Solutions
EGS	Ecosystem Goods and Services
IDP	Integrated Development Plan of Local Government
KBA	Key Biodiversity Area (as per CEPF priority areas in MPAH)
MPAH	Maputaland Albany Pondoland Hotspot
MIG	Municipal Infrastructure Grants, from National Treasury, implemented by DBSA
NWA	National Water Act (Act of 1998)
PES	Payments for Ecosystem Services
PLAS	Proactive Land Acquisition Strategy
SANBI	SA National Biodiversity Institute
WFW	Working for Water OR Working for Wetlands
WSA	Water Service Authority, normally forming part of the DM

View from Matatiele Nature reserve over the town's water supply reservoir.

1. CONTEXT and GENERAL OBJECTIVES

1.1 Introduction

Expanding on its biodiversity and livelihoods experiences in the Namaqualand Region of the Succulent Karoo Hotspot, CSA seeks to develop a long term strategy and programme that effectively supports the restoration and maintenance of a healthy Umzimvubu River system from source to sea. The Umzimvubu catchment and river system lies along the northern boundary of the Eastern Cape and extends for over 200km from its source in the rugged Maloti-Drakensberg watershed on the Lesotho escarpment to its estuary at Port St Johns where it joins the Indian Ocean. The proposed focus area covers more than 2 million hectares in the Eastern Cape and is comprised of almost 70% communal land. The Umzimvubu River System has been prioritised nationally as being one of the few remaining "near-natural rivers" (NFEPA Assessment, 2011) but is classified as vulnerable as a result of rapid rates of degradation in the watershed. In addition to the freshwater system, the adjacent matrix of grassland, forest, thicket, and dune vegetations are some of the most biodiverse in the world, with four distinct KBAs falling within the watershed corridor. These habitats support more than 70 vulnerable, and endangered plant and animal species and provide a range of ecosystem services that support the largely rural and peri-urban settlements with water provision, erosion control, infrastructure protection, fodder for livestock and food security, and materials for household and community use. When intact, they also provide important carbon sequestration function. Many of these ecosystems face moderate to high threat, and their summarised priority according to the MPAH profile is 'High'.

Nearly the entire corridor was part of the former Transkei homeland, with significant landscape and livelihood pressures resulting from socio-economic activities and challenges. A classic microcosm of an 'economy in transition', traditional lifestyles are juxtaposed by development pressures driven by a growing semi-rural/peri-urban population needing increasing degrees of clean water, infrastructure and employment opportunities. These development efforts are mostly at the expense of landscape integrity, with wide scale transformation of ecological functions and landscapes, but where great opportunity still exists to mitigate the impacts of the irrepressible tide of rapid change in favour of a more sustainable growth path towards a 'green economy' state.

The CSA Umzimvubu Corridor strategy aligns with the SA government's GE strategy/policy as well as CI's policy on GE transformation, and ultimately, seeks to support the organisation's vision and long-term goal related to water and climate security as presented in our 2010-2015 Strategy:

Vision: South Africa's Hotspots are restored and maintained to provide water, food, and climate change resilience for the long term benefit of people and nature.

Goal: By 2020, government and donors have integrated ecological approaches into their strategies for responding to climate change, and CSA has supported the maintenance and restoration of ecosystem services, particularly water catchments and habitat linkages for optimal flora and faunal persistence, through the empowerment of private and communal land stewards in three mega-corridors (>300,000 ha).

Figure 1: rural villages in the Highlands grasslands foothills, where alien plant invasion has become a huge threat to ecosystems services, carried downstream from higher infestation and by livestock movement.

This document provides an overview of the Umzimvubu Corridor based on existing information and data. It also identifies knowledge and implementation gaps and describes a range of opportunities for interventions which can augment the maintenance of biodiversity and healthy ecosystems in this area of the MPAH. Based on this information, the final section evaluates CSA's larger institutional goals and initiatives and uses this to describe a 20-year strategic framework for our work in the region.

1.2 Location and spatial delineation of the Umzimvubu River Basin

The map below in figure 1 indicates the proposed study area outline in relation to the MPAH boundary (shown in red) and is based on the inclusion of the entire Umzimvubu catchment, with extensions along the Pondoland coastal area north and south of Port St Johns. Figure 2 shows the distinct tertiary and political boundaries which CSA uses to define its geographic area of interest for the next twenty years. The total area proposed for the study, shown by the black outline in figure 2 above, includes nine local municipalities and an area of approximately 2 524 000 ha, 40% of which are nationally identified and globally prioritised KBAs.

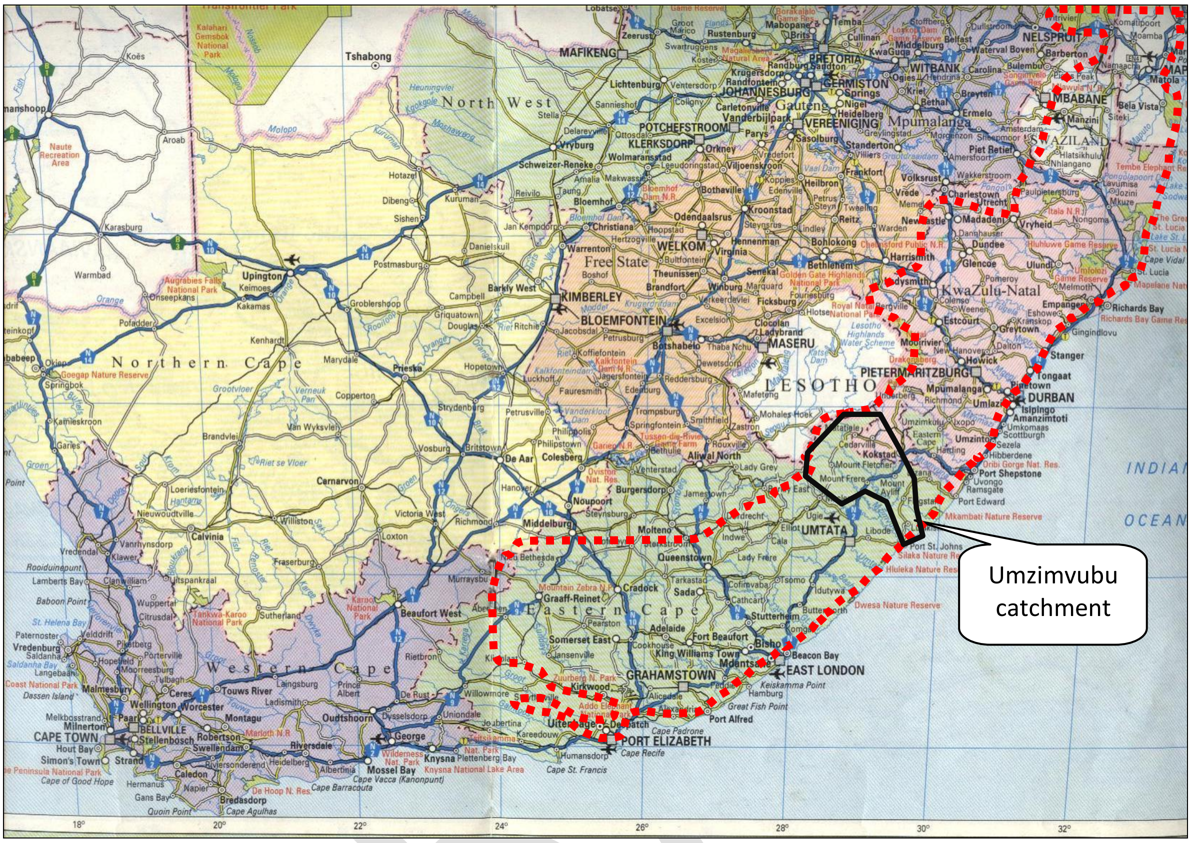


Figure 2: location of Umzimvubu catchment in South Africa, in relation to the MPAH boundary shown in red.

1.3 Motivation for spatial extent of proposed focus area

Considerations which justify the selection of this area of the MPA Hotspot include:

- High percentage of globally threatened terrestrial and aquatic species in two adjacent corridors (Highlands grasslands and Pondoland);
- Covers four priority areas or KBAs ranked by CEPF Ecosystem profile as areas with high potential to maintain functional ecosystems (see Table 1);
- A response to local role players' voluntary initiative in the Upper Umzimvubu area to co-ordinate existing sporadic catchment activities (*DBSA minutes, Oct2010*);
- Representative of one of the major biomes in southern Africa, namely grassland, of which 98% remains unprotected, with opportunities for developing replicable models for PES and Green Economy strategies on a national level;
- Located in the northern portion of WMA12 (Water Management Area 12), the hydrology of which is largely undammed, but under severe threat from alien plant encroachment;
- Identified by SANBI as a potential area for brokering PES agreements between upper catchment land rights' holders and downstream water users, providing an excellent platform for learning and experience sharing at demonstration and policy levels in a region where sustainable rural water supply is becoming a priority;
- The area has landscapes which are relatively intact with respect to transformation through industrial and commercial use, but which are under threat from agricultural over-use or misuse, and have the potential to be restored;
- Highlands grasslands have the highest combined assessment importance for adaptation to climate change impacts and improving long term climate change (CC) resilience;

- patchy information and sporadic accurate data are available on land use character, ecological status and hydrological systems exists, requiring ground verification to assist with climate change resilience building and adaption strategies, especially in terms of support to local authorities;
- No formal protection or co-ordinated active intervention on a wider scale, but the existence of a range of role players and actors, with possibilities for biodiversity intervention support;

TABLE 1: SUMMARY OF KBA'S WITHIN CSA'S UMZIMVUBU CORRIDOR PROGRAMME				
Key Biodiversity Area (KBA)	**Size in hectares**	**Ecosystem services rating**	**% site protected**	**% critical, threatened or vulnerable habitat**
NE Cape / Upper Umzimvubu/Matatiele	658 480	Medium	0.6	0.8
Lower Umzimvubu / PSJ forests (two combined KBAs)	195 152	Very high	0.1	26
Pondoland north coast	172 210	Very high	5.8	36

The wider Umzimvubu catchment sphere of influence boundaries were identified on the basis of the following spatial plan delineations:

a. **Sub-water management areas of *Umzimvubu* and *Wild Coast*** which occur within the greater WMA12 (water management area) as defined by CSIR, 2011 and which are used by DWA for determination of catchment management agencies (CMAs). This aligns fairly well with the above area description and extent, and inclusion of the associated freshwater management priorities and hydrology concerns will augment the wider ecological function considerations of the intervention. This will include portions of the following tertiary catchments: T31, 32, 33, 34, 35, 36, T60 and T70, as shown in figure 3 below. **Note the outline shape of the combined marked catchments, which forms the general outline of the Umzimvubu's sphere of influence and the proposed intervention programme, and which is shown in the maps above and used in the descriptive maps hereafter.**

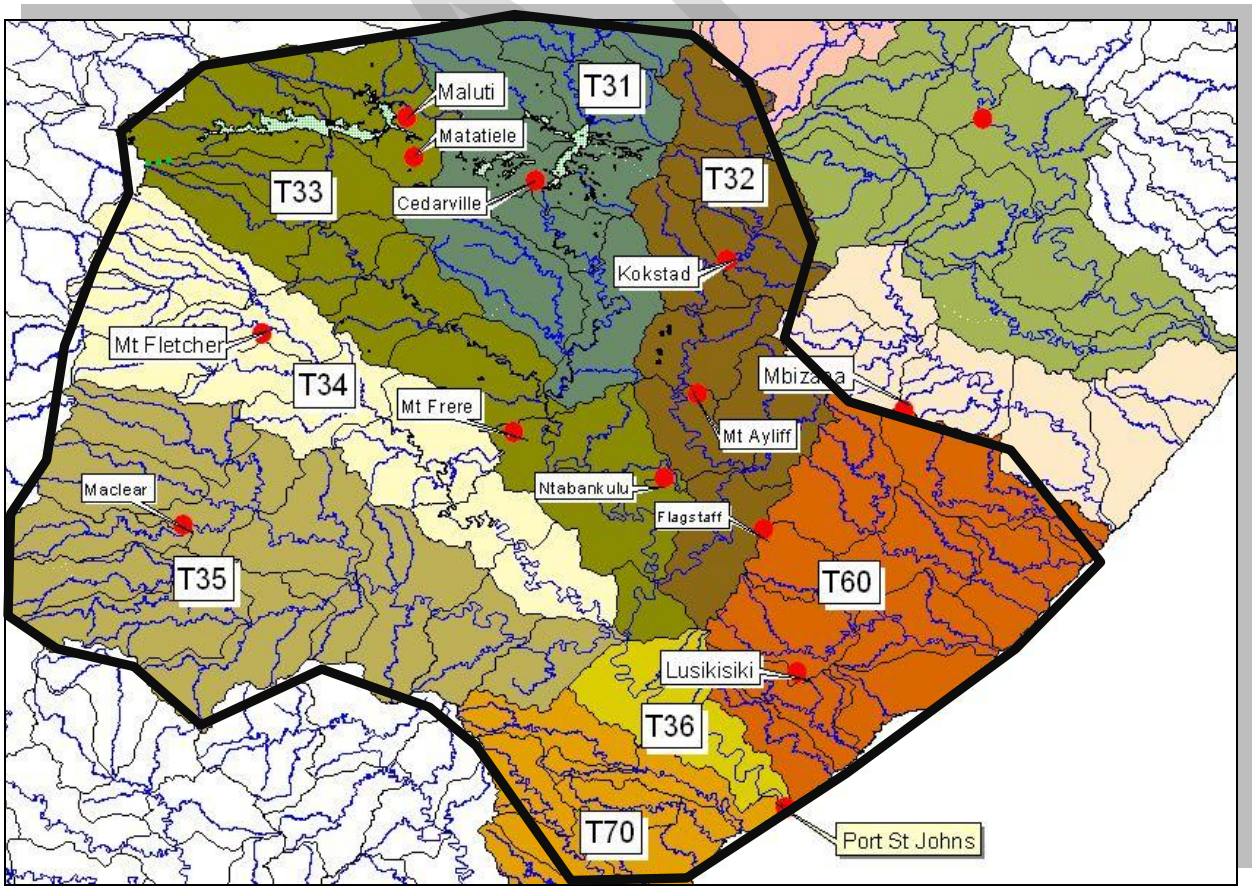


Figure 3: Tertiary catchments T31 – T36 which comprise the Umzimvubu river corridor, as well as Upper and Lower Umzimvubu KBAs, with adjacent T70 and T60, which form part of the Port St Johns forests and Pondoland KBAs respectively.

b. The **Eastern Cape Biodiversity Conservation Plan** (produced by SANBI in 2009) provides a fairly comprehensive zonation of the province into Critical Biodiversity Areas (CBAs) based on existing status, recommended best land use and degrees of 'allowable' transformation. Although not yet promulgated as the

provincial Biodiversity Management Plan, the ECBCP forms an important part of the current environmental management toolkit, and is used as the geographical basis for triggering the basic environmental assessment process under NEMA notice R546. Much of the target area as described above falls within either terrestrial or freshwater aquatic CBAs, requiring careful land use planning and minimum transformation of habitat through changing land use. Please refer to figure 4 below for an indication of the spread of these CBAs in the proposed focus area.

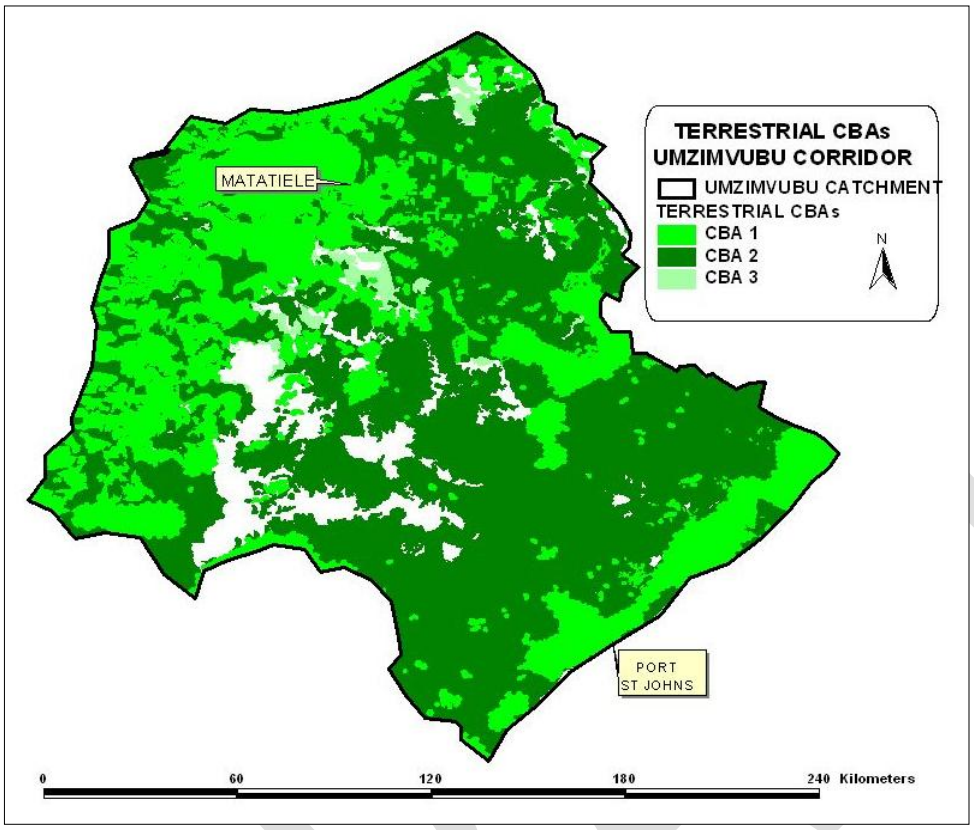
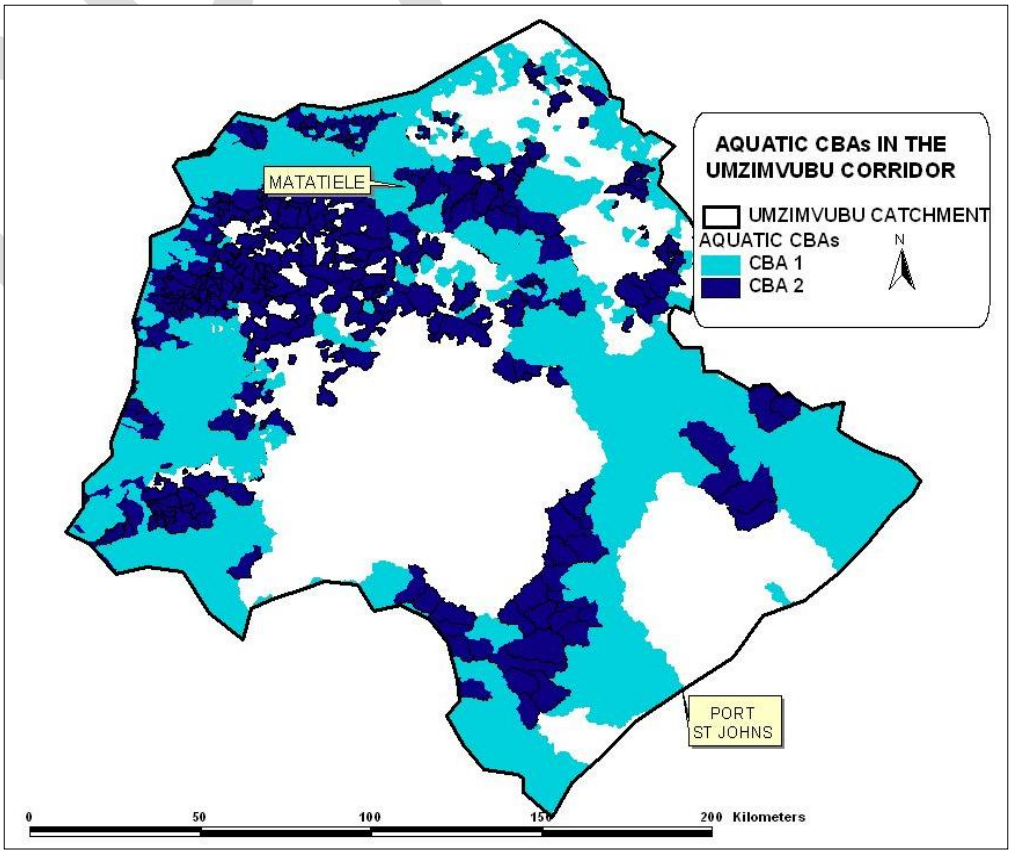


Figure 4: CBAs in the Umzimvubu catchment showing critical terrestrial (left) and aquatic (below right) biodiversity areas, as defined by the ECBCP, which should undergo as little transformation as possible in order to retain ecosystem function integrity.



c) The **SANBI Grasslands Programme PES business plan:** This plan strongly advocates for partnerships in the upper Umzimvubu, with studies indicating that good management practice can potentially result in an additional 3.9 Mm3 per annum in winter river base flows and a reduction in sediment of up to 4.9 Mm3 per annum (SANBI, 2010). The Umzimvubu is the largest undeveloped river system in South Africa with only a few minor dams, with the upper sections of the catchment experiencing large scale degradation and increasing alien plant infestations. Studies indicate that the local economy is characterised by subsistence agriculture with limited commercial farming. Catchment management in this area has great potential to increase access to water in periods of scarcity, thereby reducing rural household vulnerability since rural households in this area rely on river water as their main source of water. Target quinaries include the Mabele (part of T33 and the Kinira catchment) and the Tina river (T34) to the west, with WFW as a key driver.

d) **CEPF KBA and Priority Corridors for Biodiversity Conservation**: The CEPF Maputaland-Pondoland-Albany Hotspot Ecosystem Profile (2009) utilised a rigorous conservation planning process to select areas of greatest importance for the conservation of species. Figure 5 below shows the location of the proposed focus area in relation to the four KBAs and priority corridors, as defined in the MPAH ecosystem profile.

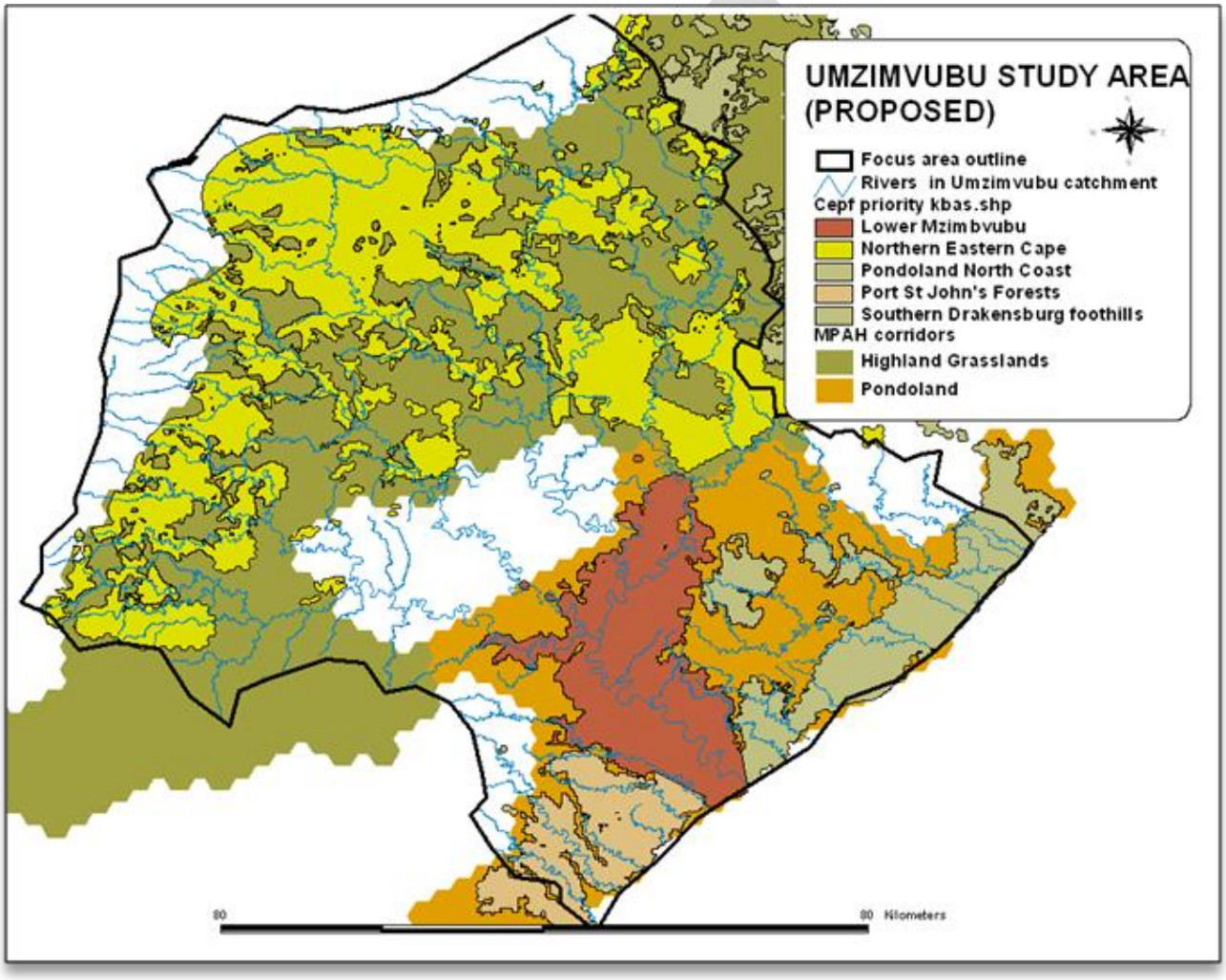
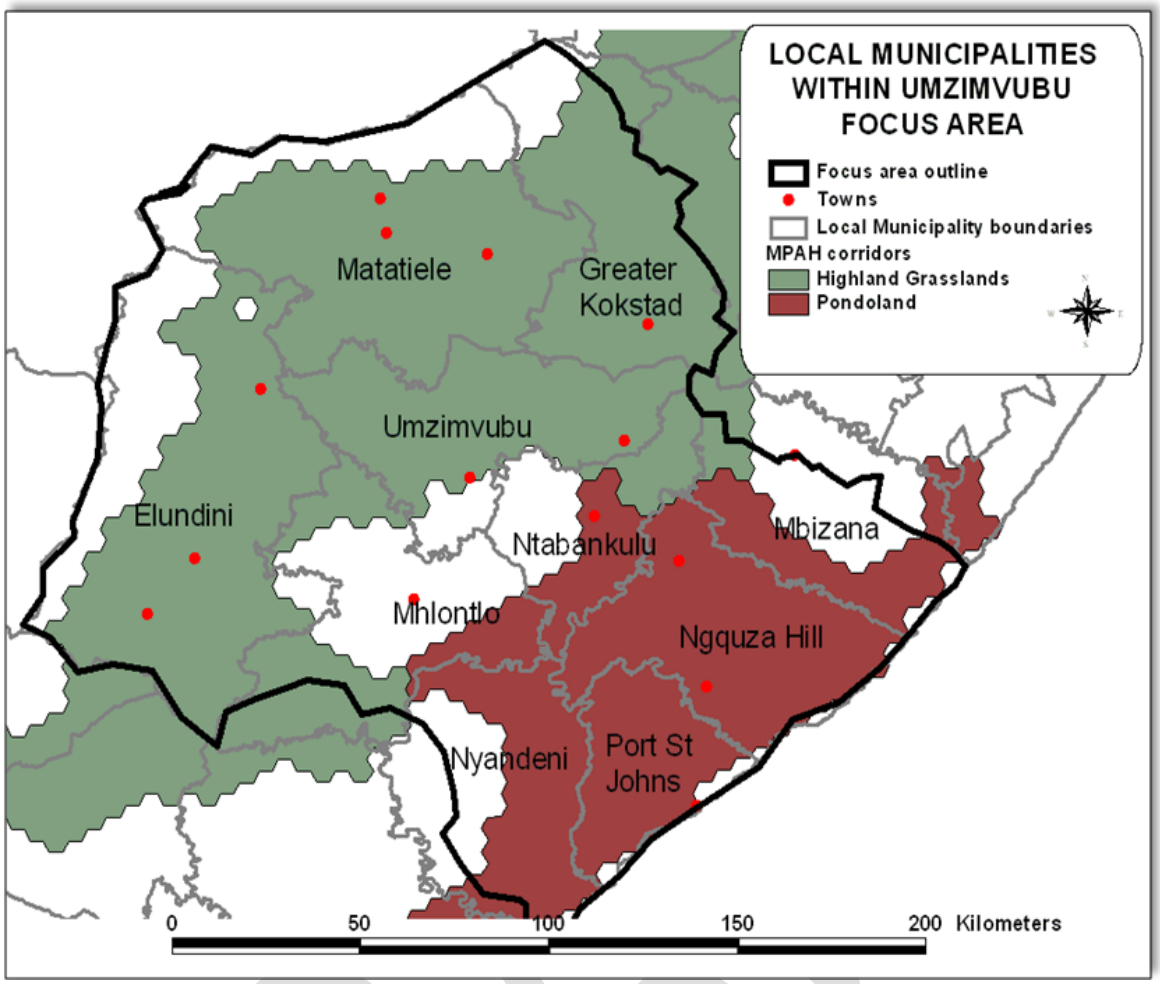


Figure 5: CSA Umzimvubu programme focus area, in relation to MPAH priority corridors and KBAs.

1.3 Land tenure and local authority jurisdiction

The area covers ten predominantly rural local municipalities, nine of which fall under the Eastern Cape under Alfred Nzo and OR Tambo districts, with a portion of the easternmost area falling under Greater Kokstad Municipality in KwaZulu Natal/KZN. The map below shows the spread of these municipal demarcations in the catchment.



Insert map

Figure 6: Local municipal boundaries and MPAH corridors and municipal boundaries and towns. Note that Mhlontlo, Nyandeni and Mbizana extend beyond the focus /programme area boundary.

The focus area consists of approximately 67% communally held land in the former Transkei, with just over 33% being privately owned and titled, made up of towns and surrounding commonage, plus two large commercially farmed areas, located in the Maclear and eastern Matatiele/Kokstad areas. While the latter areas are comprised of fairly straightforward titled farmland owned by individuals or Trusts, sometimes subject to land claims and thus in a dynamic state with respect to future ownership, the communal land tenure aspect is interesting and complex, with communal land under the custodianship of the Department of Rural Development & Land Reform (DRD&LR) on behalf of the land rights holders (the communities living on the land). Local management is carried out under the jurisdiction of the traditional authority system of area chiefs and village headmen. Any developments on this state held communal land require consultation with the DRD&LR which facilitates consultation with affected communities and Chiefs, under the Interim Protection of Informal Land Rights Act (IPILRA).

Private title exists in all of the towns, which have their own Land Use Management Schemes (LUMS), and any developments in these areas are subject to the local municipal by-laws, some of which still fall under the old Transkei Land Development Ordinances, and which are peculiar to the area. Subdivisions and consolidations are challenging procedures, administered through the DPLG (Provincial and Local Government)

Of importance here is that the proposed focus area is comprised of an approximate 67/33 communal/private split with respect to land ownership and any interventions would need to take consideration of this and the relevant procedural guidelines.

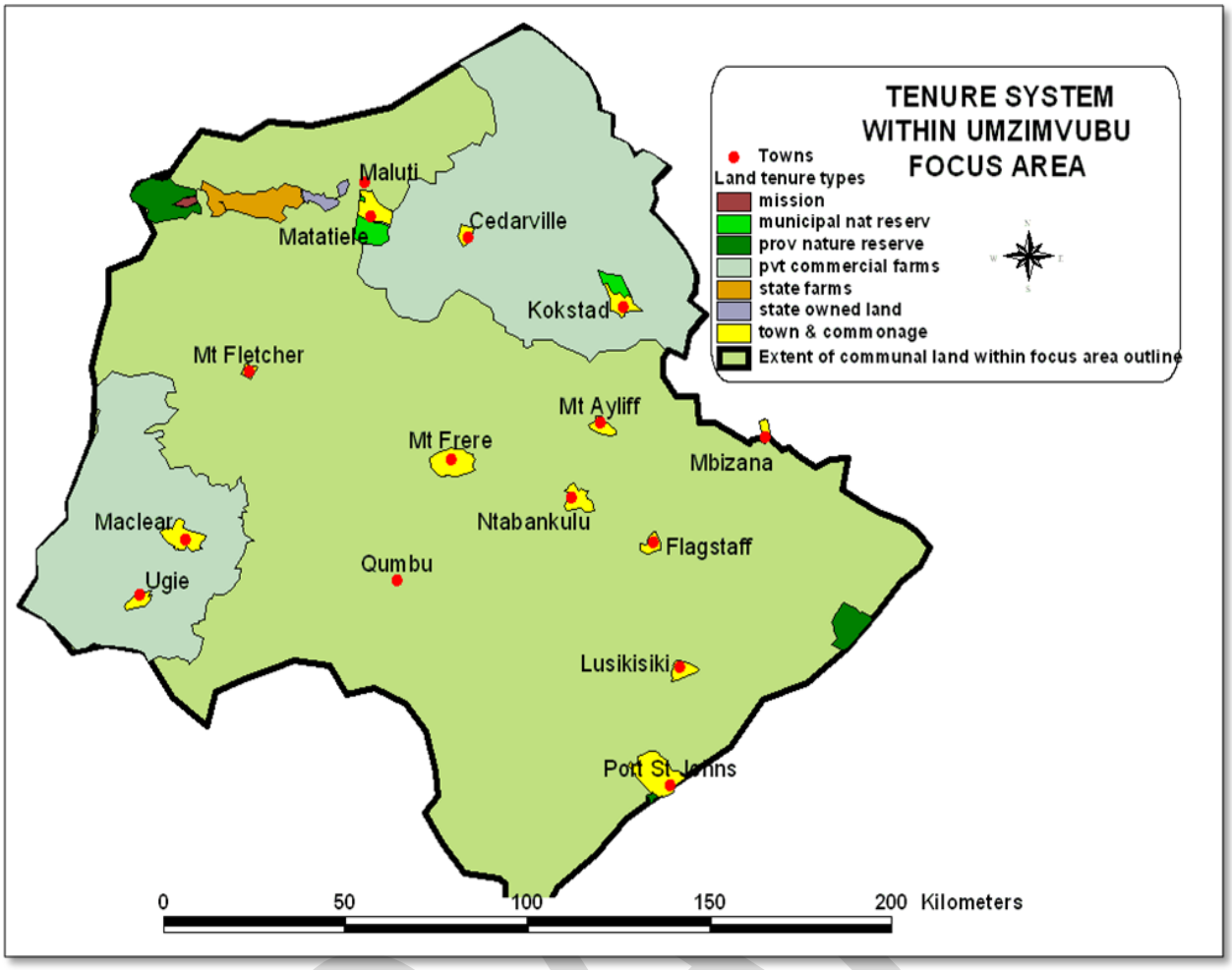


Figure 7: land tenure areas showing private titled land including towns and commercial farmlands. Note this is a rough estimate and requires refinement based on detailed mapping and ground verification.

1.4 Spatial considerations and extent of Phase 1 Focus Area

Discussions and field exploration with local stakeholders revealed that a reduced focus area for an initial five year catalytic phase may be more feasible, based on limiting institutional complexity (two Districts, as opposed to four) and a smaller stakeholder group along the main Umzimvubu tributary. This area fills a gap of institutional operations by the National Working for Water Programme and has some of the highest areas of biodiversity concentration. This resulted in selection of tertiary catchments T31, 33 and 36, as shown below. Within this area, CSA further prioritised the upper catchment in the Matatiele and Umzimvubu local municipalities, recognising that the main threats to the river system from alien tree invasions and sedimentation are greatest in this 'zone' and flow from the river source.

The priority focus area for the initial phases of the longer 20 year programme will focus in on the immediate river corridor, where CSA has the most opportunity for achieving the desired impacts within its greater goal. This focus corridor amounts to approximately one million hectares, as shown in figure 8.

For planning and practical intervention management purposes, this narrower corridor is zoned into three sections based on predominant biomes linked with institutional demarcation, namely:

- **Uplands / watershed** zone– grasslands biome, generally over 1200m and falling within Matatiele Local Municipality in the Alfred Nzo District;
- **Central zone** – grasslands becoming bushveld with mistbelt patches, with parts of Umzimvubu and Ntabankulu Local Municipalities, also in the Alfred Nzo District;
- **Lowlands / Pondoland** – bushveld and coastal biomes, consisting of portions of the Ngquza Hill, Port St Johns and Nyandeni Local Municipalities, in the OR Tambo District.

These zones are shown in figure 9 below, with baseline demographic and ecological information in table 2.

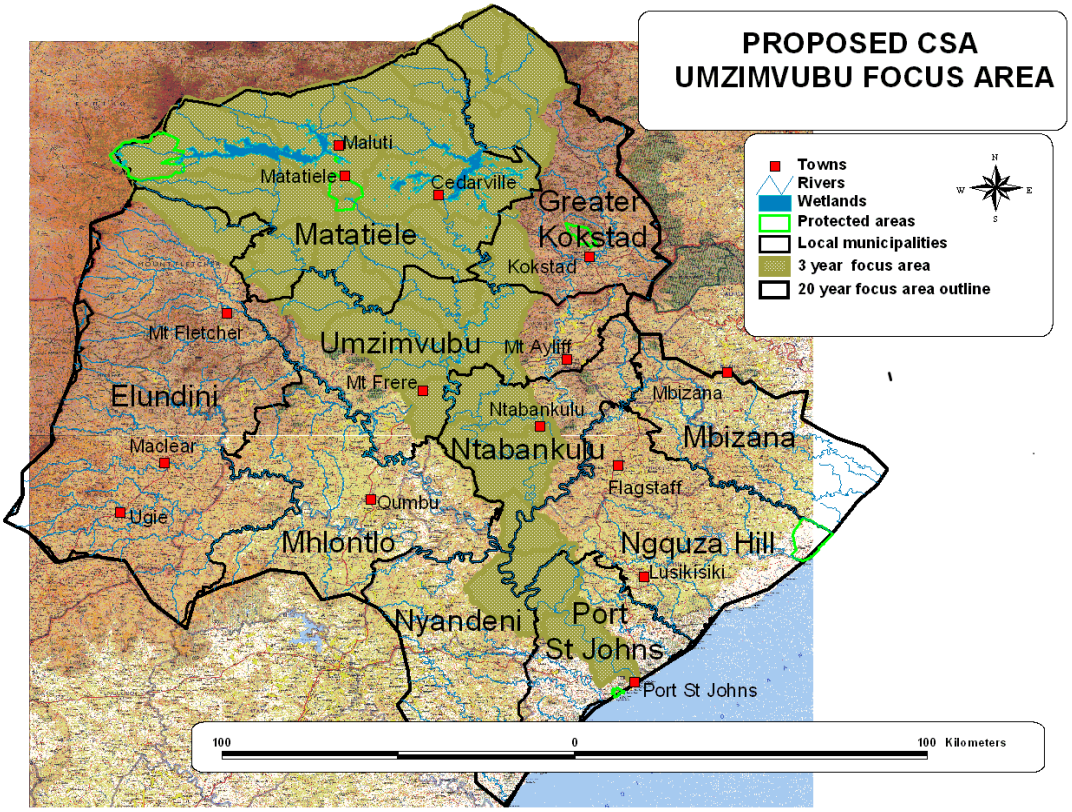


Figure 8 above: focus corridor for initial priority intervention. **Figure 9 below**: proposed 'zonation' of the focus corridor

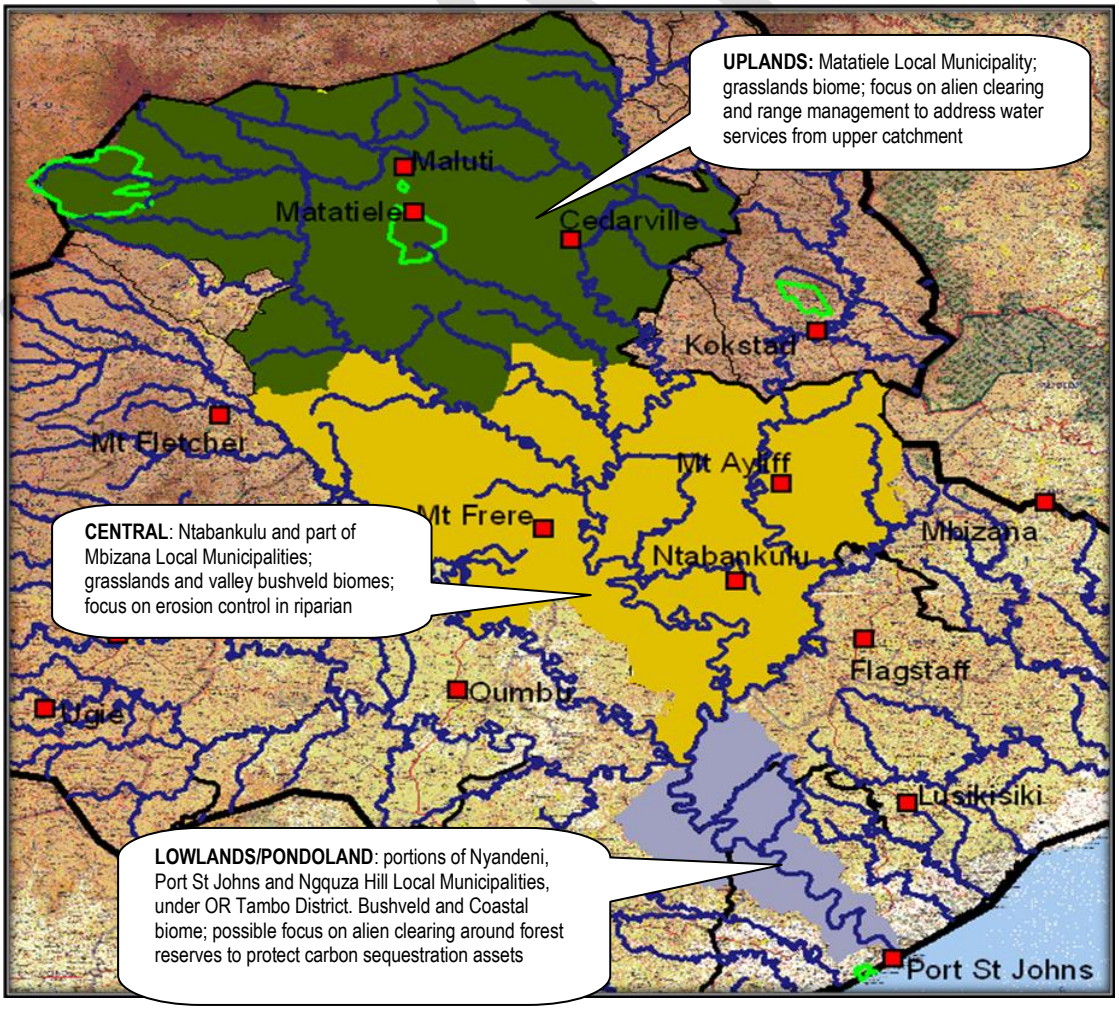


TABLE 2: BASELINE INFORMATION PER ZONE IN THE UMZIMVUBU FOCUS CORRIDOR					
ZONE	**AREA in ha**	**POPULATION**	**BIOMES & VEG TYPES**	**CLIMATE & Rmm**	**DEGRADATION**
UPLANDS / WATERSHED	435 230 ha	260 000, mainly Sotho and Xhosa speakers, 5% English & Afrikaans	Grassland, limited mistbelt patches; 8 vegetation types	Temperate. Cold winters, warm summers. Summer rainfall. MAR 750mm	50% moderate degree of degradation (ARC, 2011).
CENTRAL	414 500 ha	360 000 mainly Xhosa speakers	Grassland and valley bushveld mosaic; 8 vegetation types	Temperate to sub-tropical. MAR between 750 - 1000mm	50-75% strong degree
LOWLANDS / PONDOLAND	120 000 ha	150 000 Xhosa, 5% English	Bushveld & coastal; 12 vegetation types	Sub-tropical, no frost. MAR >1000mm	50% moderate degree of degradation

The focus for phase one will be the uplands zone – this is described in the Five year strategy.

2. BIOPHYSICAL DESCRIPTION THE UMZIVUBU CORRIDOR

2.1Geology, topography and climate

2.1.1 General geological make-up

The focus area forms part of the Karoo supergroup, and is underlain primarily by Beaufort group formations lying in a northeast-southwest direction. The higher lying areas in the upper watershed comprise of, from higher altitudes downslope, Drakensberg, Clarens, Molteno and Elliot and formations (Murray, et al, 2010), with the levelling out of the landscape in the mid Umzimvubu catchment occurring on Burgersdorp and then Adelaide 2 formations (see figure 6 below), where Mt Frere, Mt Ayliff, Ntabankulu and Kokstad occur. Moving east and south, from Flagstaff towards the coast, the area is underlain by Ecca and then Dwyka formations, with the attractive remnant Cape Supergroup Msikaba sandstone belt peculiar to the Pondoland north coast following the coastline from Mkambati nature reserve northwards.

Much of the central area has extensive intrusions of Karoo dolerites (Norman & Whitfield, 2006), notably near the Mt Ayliff area where the Ntsizwa massif forms one of the best documented bodies of this dolerite formation in the country. Much prospecting for minerals such as copper, nickel and platinum has occurred, and is still taking place, in the Ntsizwa dolerite contact zone, resulting in a network of mineshafts which have become a habitat for four rare species of horseshoe bat. It also supports a rich intersection of biodiversity representing thicket, grassland and mistbelt forest biomes in a concentrated area.

The dolerite massifs are also responsible for the very rugged nature of the terrain in the central focus area, before it gentles out into the rolling hills of the Pondoland coast which are so representative of the former Transkei rural areas bordering the 'Wild Coast'.

2.1.2 Soils

The area consists primarily of sandstones, with basalt material in the upper alpine zone, becoming predominantly sandstones with shales and mudstones, with fairly deep alluvial deposits in the lower lying areas: the alluvial soils are a combination of the parent materials from the upstream areas, and have high organic content from the high erosion levels in the upper catchment due to poor groundcover from inappropriate landscape management. The immediate floodplain areas are sandy due to their dynamic nature and constant deposits, while the wider alluvial plains have darker material reflecting greater development with clay and organic matter. Many of the alluvial areas have grey poorly structured soil reflecting dynamic and eroded landscapes in the catchment.
The area has experienced different forms of degradation in the recent decades, which have resulted in removal of substantial amounts of soils, resulting in extensive areas of bare bed rock being exposed especially on steep slopes. Overgrazing especially by goats is common, and the unrestricted removal of vegetative cover has resulted in destruction of soil structure, which makes it vulnerable to erosion.
Grazing of crop residues following harvest is common resulting in soils being left bare and prone to erosion. Removal of organic residues prevents the built-up of organic matter, an important binding element for soils which also retains most of the soil fertility.

Interestingly, there has been substantial recovery in the vegetative cover along the watershed border areas between the Alfred Nzo District and Lesotho, as grazing was virtually stopped due to stock theft. The soils are starting to build up and together with the different species of plants and animals that thrive in the area when there is minimal disturbance. This is an indication of the potential for ecological function restoration in these disturbed areas.

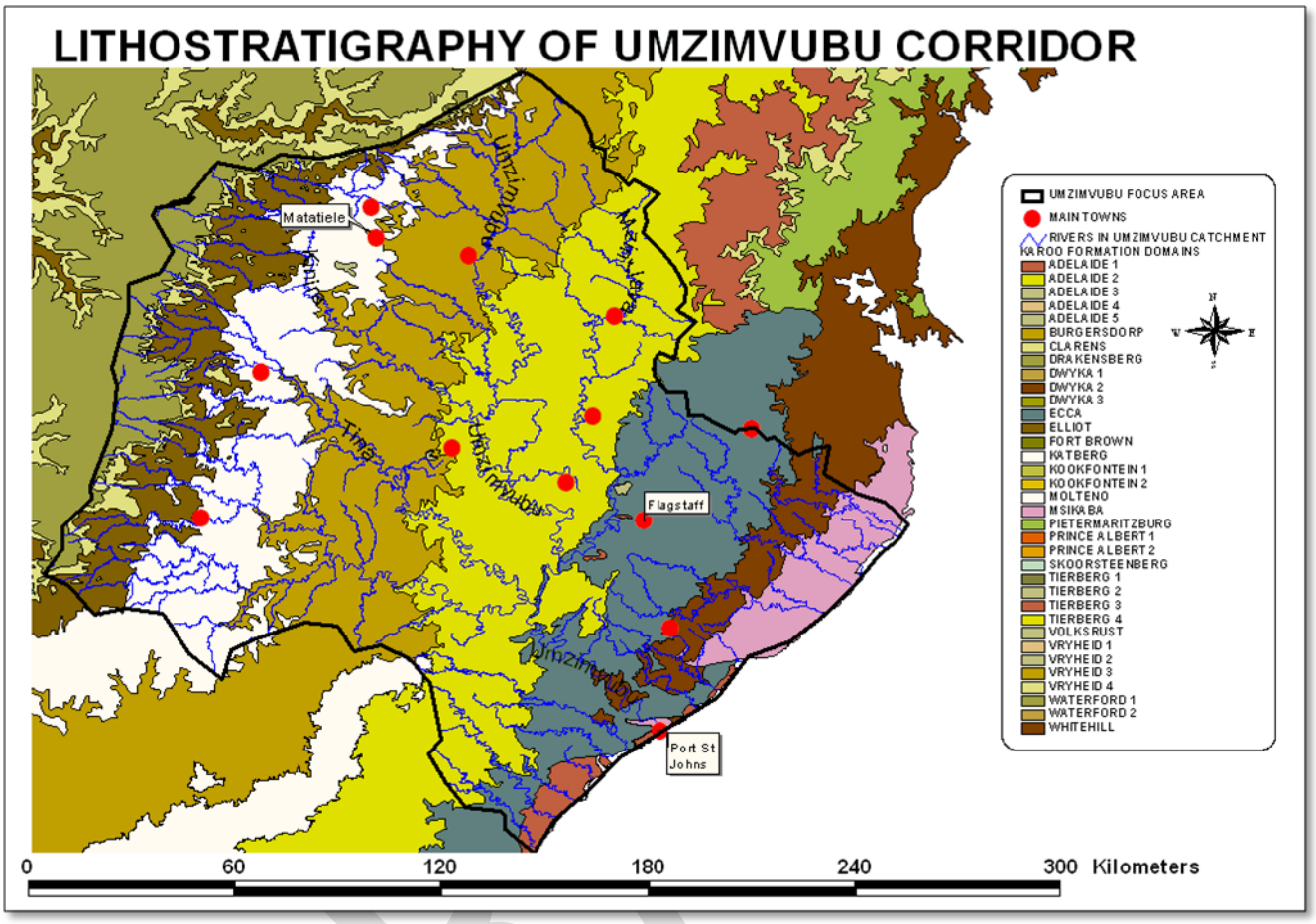


Figure 10: Lithostratigraphy of the Umzimvubu basin (based on GIS from Murray et al, 2010)

2.1.3 Climate and climate change scenarios

The climate ranges from temperate, with high frost frequency, in the northern higher altitudes to sub-tropical along the coastal belt. It is a summer rainfall area, experiencing extreme rainfall in summer of up to 150mm in a single event. Average rainfall increases from north to south, from approximately 650mm in the higher lying areas in the upper catchment, with 1000mm per annum along the coastal areas.

The target KBAs exhibit a range of climate change impact potential, from highest in the upper catchment to medium low in the lower Umzimvubu and coastal Pondoland areas (ref. MPAH profile). The entire target corridor has potential to support climate change resilience through its extensive rural landscape with minimum infrastructural footprint. River corridors and landscapes of high topographical variability, as represented in the target KBAs, are recognised as important refugia for the resilience of freshwater species.

During the development of the CEPF Ecosystem Profile, the Umzimvubu Corridor region was identified as an area of greater resilience to climate change. However, the region is experiencing seasonal shifts and climate modelling capacity is increasing annually. As such the impact of various climate scenarios on the Umzimvubu River and its specific tributaries is relatively unknown.

2.2 Terrestrial habitats and current status:

There are eight recognised biomes or eco-regions in South Africa, five of which occur in the focus area, with the majority being Grassland (69%) followed by Savannah (21%) and Coastal (8%) according to SANBI's BGIS data. The Forest and Thicket biomes, although not officially included in the primary spatial BGIS database, represent

approximately 2% each within the entire focus area, but still constitute important habitats and carbon sequestration media, covering approximately 40 000 ha.

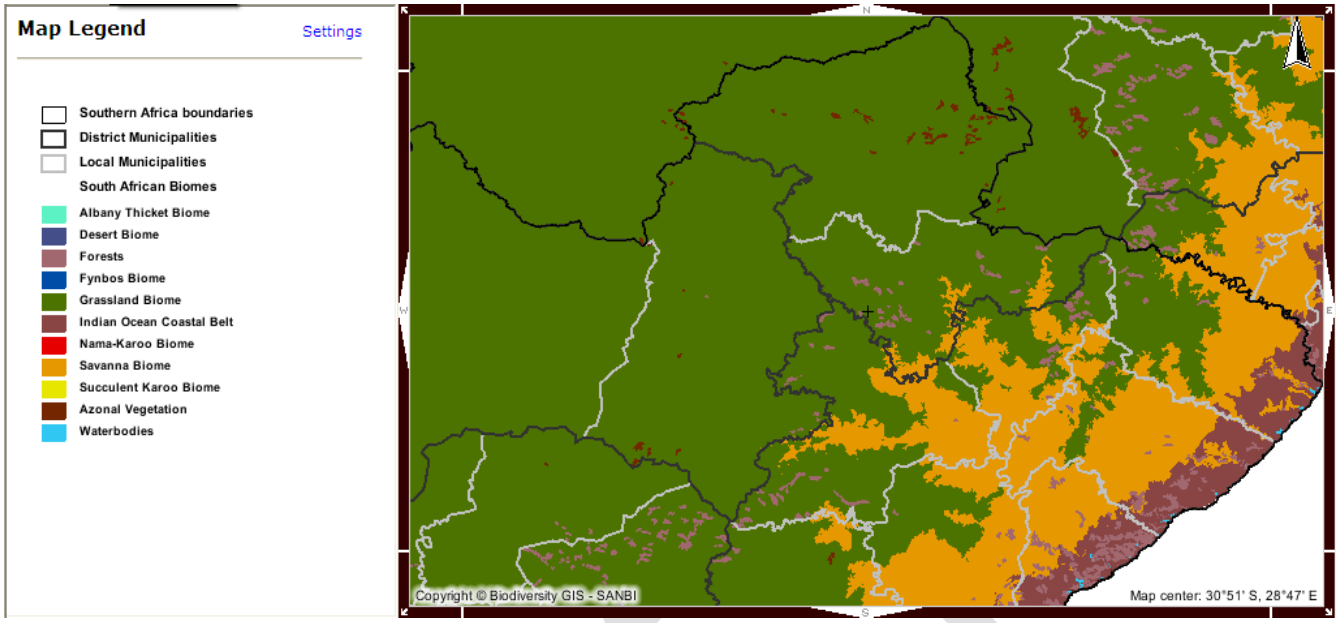


Figure 11: biomes represented in the focus area, from SANBI BGIS data

Each biome has numerous sub-divisions which form a complex mosaic of 22 vegetation types. The vegetation of the northern and central area falls mainly within the *Grassland biome*, while *Savannah* is represented in the central and western areas, and Coastal biome along the south eastern rim. Pockets and patches of *Forest* (mistbelt, scarp, coastal and mangrove) and *Thicket* form a complex intersection of rich biodiversity. The forest biome is the smallest eco-region in the country, comprising just over 0,5% of the land surface area, whilst savannah comprises 46% of South Africa. Grassland is one of the most threatened biomes in the sub-continent, with 60-80% irreversibly transformed (almost 50% of South Africa's grasslands are ploughed) with less than 2% of our grasslands formally conserved (WWF, 2002).

A detailed vegetation map (Figure 8) is shown overleaf, indicating the extent of all the vegetation types found in the study area.

The main biome areas are described in the sections below, with reference made to their basic composition, status and types of land use (historical and current) which is affecting their status and ecosystem function. The text also highlights potential intervention opportunities in the context of the biodiversity and conservation objectives articulated in the of the MPAH profile.

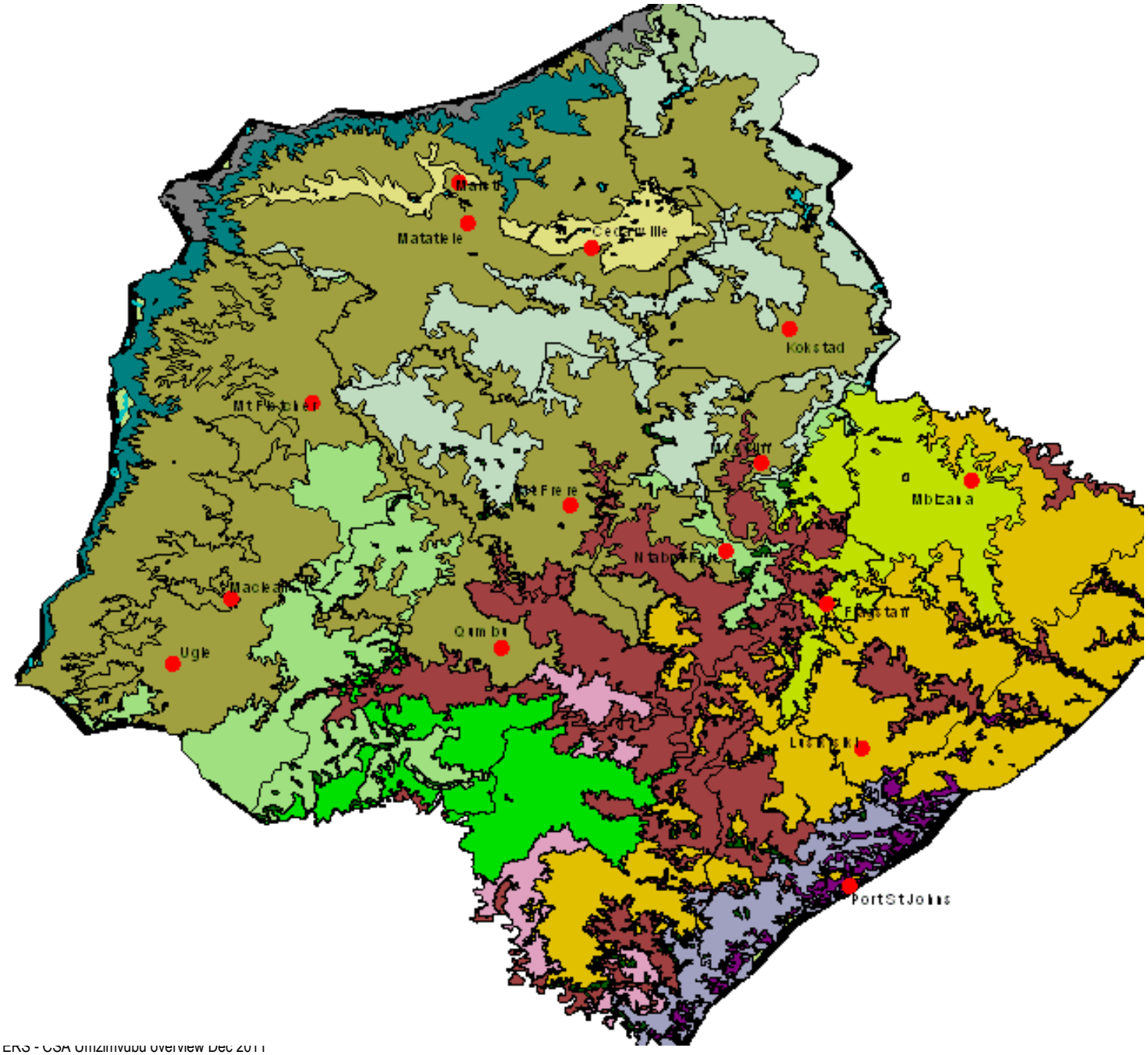


FIGURE 12: VEGETATION TYPES

Drakensberg Foothill Moist Grassland	
East Griqualand Grassland	
Lesotho Highland Basalt Grassland	
Mabela Sandy Grassland	
Southern Drakensberg Highland Grassland	
uKhahlamba Basalt Grassland	
Lesotho Mires	
Midlands Mistbelt Grassland	
Ngongoni Veld	
Pondoland-Ugu Sandstone Sourveld	
Eastern Valley Bushveld	
Bhisho thornveld	
Mthatha moist grassland	
Scarp Forest	
Southern Mistbelt Forest	
Subtropical Dune thicket	
Subtropical Seashore Vegetation	
Nothern Coastal Forest	
Subtropical Coastal Lagoons	
Transkei Coastal Belt	
Mangrove forest	
Eastern Temperate Freshwater Wetlands	
Subtropical Estuarine Salt Marshes	

2.2.1 Grasslands and associated vegetation

The highlands grasslands, which comprise the largest portion of the target area, are poorly represented in the protected area network, with poor grazing management leading to extensive degradation and reduction in biodiversity, ecosystem function and resilience. Grasslands are the home to more than 3370 plant species, ranging from tiny wildflowers and medicinal bulbs through to large flowering *Protea* trees. The growth of trees is restricted in the higher altitudes by dry frosty winters and frequent fires. Some shrubby growth and smaller trees exist in more protected areas and along riverbanks.
Local diversity is dependent upon several natural factors, such as climate, altitude, aspect and soil. Grassland composition and species representation is obviously not standard throughout, and varies due to the above factors, as well as due to types of past and current land use. Heavy grazing by sheep, for example, will put pressure on more palatable decreaser species such as *Themeda triandra* (rooigrass), whilst old lands will show a prevalence of increaser species such as thatchgrass or *ingca* (*Hyperrenhia hirta*).

The Grasslands corridor is comprised of predominantly East Griqualand Grassland, followed by Drakensberg foothill Moist Grassland in the higher lying areas. The higher lying foothills in the northern area, generally over 1600m altitude, and areas along the escarpment bordering Lesotho are generically known as *montane grassland*, and support a high diversity of species and endemism. The Lesotho Highlands Basalt grassland and Southern Drakensberg Highland grassland are mostly excluded from the MPAH area, but provide an important upper catchment support function if intact. The reasons for exclusion of this zone from the hotspot boundary are not apparent, but are questioned here due to the biological and functional importance of these upper catchment areas. An important work by Cowling & Hilton-Taylor (1994), mapping centres of endemism in southern Africa, identifies the Maloti/Drakensberg or Eastern Mountains 'hotspot', based on the high biodiversity and presence of over 30% endemic plants. This is one of the reasons for the establishment of the Maloti-Drakensberg Transfrontier conservation project, and a strong motivation for including these areas in the scope of the proposed CSA intervention, albeit currently on the margin of the MPA hotspot.

The montane and highland grassland areas support a wide range of fauna and flora common to such areas, including:

- A good diversity of indigenous grasses including *Themeda triandra, Erogrostis* species, *Rendlia altera,* (toothbrush grass) and *Cymbopogon* (turpentine grass) which exist in the higher areas away from villages. While some historical disturbance is evident, the composition of grasses indicates a climax grassland with limited pressure and current disturbance, due to the low stocking rates resulting from the extreme stocktheft in the border area.
- Two species of Protea*, P. roupelliae* and *P. caffra* , which are both protected species. The Proteas are found scattered across the grasslands in the higher lying northern areas, and have a high resistance to fire. The area is frequently burnt by herders, appearing to keep many other tree species in check.
- Several *Rhus* (Kharee) species, including *R. dentata* (iNtlakotshana or nanaberry), *Maytenus*, *Buddleia salvifolia* (lotweni or wild sage), *Rhamnus prinoides* (blinkblaar) *Carissa bispinosa*, *Halleria Lucida*, *Leucocidea sericia* (chichi or ouhout), *Cussonia spicata* (cabbage tree), etc. These species are generally found in clusters below cliffs or in moister protected areas.
- Small pockets of indigenous vegetation, including some magnifient tree specimens such as *Olinia emarginata* (mountain Hard Pear) and Celtis africana (White Stinkwood).
- Flowering plants are well represented with at least 18 species being recorded, ranging from *Helichrysum* species and *Lobelias*, to *Watsonias, Zantedeschia* (Arum), *Cyrtanthus* (Fire Lily), Moraea (wild Iris), the tiny grass aloe and *Berkheya*.
- The rare "Berg Bamboo' (*Arundaria tasselata*) is found on some of the south facing and very remote slopes of the escarpment.
- The lower lying foothill areas are known as *highveld grassland*, with an often uniform fairly short appearance. The Mabele Sandy grassland forms a smaller proportion of the grasslands, but is not found anywhere else in the country and is generally heavily impacted by settlement and associated agricultural activity, due to its location in lower lying areas associated with wetlands. These areas have some deciduous woodland or bushveld patches, of which a good example can be seen in the Rode area near Mt Ayliff. This is dominated by Acacias (indigenous species such as *A. karroo* and *A. caffra*, not the invasive wattles). A common and attractive plant in rocky areas is the bitter aloe (*Aloe ferox* or *ikhala*), which provides a spectacular flowering display at the start of winter. The leaves of this plant are eaten by birds and stock in times of drought, whilst dry leaves can be ground up for snuff.

The nectar attracts a wide range of birds and insects as well as monkeys. The aloe is prevalent from Mt. Ayliff southwards and westwards where the climate is warmer than in the northern grasslands.

- Moving southwards down the catchment, the grasslands become more Savannah biome type, with Eastern Valley bushveld interspersed with Midlands Mistbelt Grassland and the relatively poor quality Ngongoni grassland. As the Transkei / Indian Ocean Coastal Belt is reached, the vegetation becomes more lush and forested, with patches of dense Scarp Forest with Pondoland-Ugu Sandstone coastal sourveld along the northern coastal area. These are described in more detail under section 2.2.2 (forests) and 2.4 (coastal areas).

2.2.2 Current status of grasslands

In general, the status of grasslands can be described as follows :

- In the mountainous areas along the escarpment (upper quinaries), grasslands are in fairly good condition due to less grazing pressure. Previous pressure is evident in the form of old stockpaths, some eroded sections and prevalence of increaser species in areas which were obviously more palatable. Existing stock posts are generally devoid of vegetation apart from *tchichi* and wattle trees, and some have been overrun with exotic *kikuyu* grass, which prevents indigenous grasses from rehabilitating abused areas.
- Areas immediately around village settlements are often fairly devoid of groundcover, with only the unpalatable grasses and some shrubby growth such as *Chrysocoma* and *Felicia* species (bitterbush or *ralarala*) remaining in localised tufts. The loss of groundcover aids in increasing erosion of topsoil, and creates a vicious cycle of accelerating erosion which results in the landscape becoming deflated or lowered, and runoff incising the footpaths even deeper.
- Grassland areas which have been cultivated are obviously no longer 'grasslands' as they do not support the range of grass species providing an important grazing and catchment resource. Old lands which are no longer cultivated do tend to rehabilitate themselves slowly in terms of some groundcover, but such lands are often abandoned due to erosion, and therefore struggle to revert to their original climax grassland status due to the loss of topsoil and seed bank. These areas can be seen clearly in aerial photography by their difference in colour and texture from the surrounding grassland.
- Collection of medicinal plants, especially certain bulbs, for supply to urban centres such as Durban, is placing extreme pressure on selected flowering species like *Hypoxis*. Correspondents in the Maluti area have reported frequent vehicle loads of bulbs being illegally removed, and the author has personally observed on several occasions the widescale collection of roots and bulbs in the mountain areas. This has an impact on the populations of plants, and could result in local extinction. Areas of disturbance through digging activity could also allow invader species to take hold, if in the vicinity, as well as contributing to erosion, and removing a food and medicinal source for local residents as well as animals such as baboons and porcupines.
- The coastal grasslands, although lower in nutritional value, are generally in better condition from a groundcover perspective due to their limited palatability and year round growing season. This has immediate effect with respect to reducing soil loss and increasing organic content.
- The further away from settlements, the better the status of the grassland. Many of the grasslands throughout the corridor are in a poor state, with widespread erosion occuring. This leads to lowered productivity with respect to livestock production, and decreased livelihood returns for livestock owning families. The decreased ecosystem function resulting from compromised grasslands has ramifications beyond immediate land users, affecting biodiversity composition, groundwater recharge and downstream siltation.

2.2.3 Indigenous Forest and Thicket

The forest biome makes up an extremely limited area, 0.5%, of our country, with an estimated 1.6% of the focus area consisting of forest patches. The Umzimvubu Corridor is thus relatively well endowed with indigenous forest and their associated species in comparison to the national percentage. According to Pooley et al, the Corridor has four forest types and these are described in Table 3.

TABLE 3: FOREST TYPES FOUND WITHIN THE UMZIMVUBU CORRIDOR.

FOREST TYPE	KEY SPECIES	APPROX AREA IN HA
Afro montane: higher lying in sheltered ravines along the escarpment	*Podocarpus falcatus, latifolius* (yellow wood) Olinea emarginata (mountain hard pear) *Buddleja salvifolia* (lotwane/ wild sage)	Negligible. Very small pockets in upper sandstone ravines along Mehloding Trail in upper Matatiele area.
Mistbelt: on south facing	*Ocotea bulata* (black stinkwood)	14 856 ha. 3000ha in

slopes, exploited in past for timber. Habitat for endangered Cape Parrot.	*Podocarpus* spp (yello woods) *Celtis Africana(white stinkwood)*	Umzimvubu, Mhlontlo, Ntabankulu and Port St Johns LMs
Coastal scarp - transitional between mistbelt and coastal, south and east facing slopes, granite outcrops and dolerite dykes e.g. above Mngazi river valley. Habitat to rare and endemic birds and mammals incl green barbet, red squirrel, yellow streaked bulbul.	Was home to Wood's cycad, now extinct in wild *Garcinia gerrardii* (forest mangosteen) *Syzigium gerrardii* (Forest water berry) *Ficus bizanae* (Pondo fig)	Together with Pondoland coastal constitutes over 22 612 ha. Good examples at Majola (Macibi forest)
Pondoland coastal forest Occurs on sandstone outcrops, with rich variety (Umtamvuna to north harbours more endemics Kruger). Rare & endemic species incl 5 endemic genera.	*Grewia pondoensis*, *Catha abbottii* (Pondo Khat) *Maytenus abbottii, Eugenuia* spp *Phyllanthus cedrelifolius* (forest potato bush) *Ficus bizanae* (Pondo fig) Rare *Colubrina nicholsonii* *Jubaeopsis caffra (*Mkambati palm) occurs only between Msikaba and Mtentu mounths *Leucodendron pondoense*	Together with coastal scarp totals 22 612 ha. Found near Ntsubane near Lusiki, Mkambati, Egossa forest next to Magwa falls, Ntafufu

2.2.4 Status of the forests

The status of the montane forest pockets is good, as their remote location in high ravines make them generally too difficult to access for collection of firewood. Some medicinal plant collection takes place, but this is mainly by local people with intimate knowledge of the area. Undergrowth appears to be healthy, and birdlife is abundant. Some sections can be accessed along the Mehloding hiking trail north of Matatiele.

The mistbelt and coastal forest is more accessible and naturally less protected, and suffers from illegal collection of yellowwoods and other species by local people as well as by commercial loggers. Mistbelt forests near Mvenyane, Qwidlana and Ntbankulu areas in the central Umzimvubu zone are being encroached upon by commercial species such as eucalypt, wattle and cedar. These adjacent plantations provide a canopy for the spread of indigenous species, but also pose a threat along the margin of forests when logging operations commence, as these margins are damaged and the protection for new generation growth is damaged and sometimes removed. The mistbelt forests in the central Mvenyane, Mt Frere and Ntabankulu areas provide a habitat for some endangered bird species, including the Cape Parrot. This is a clear indicator that these forests are currently in an acceptable condition, with an absence of disturbance and presence of necessary foods and breeding requirements allowing birds to breed successfully. Their presence, along with relatively healthy representation of vulnerable tree species including Black stinkwood (*Ocotea bullata*) and the three yellowwood species (*Podocarpus*) was verified by the resident Forestry Officer, Mr Sandile Gwedu, at Goso Forest south of Ntabakulu during a field visit in mid October.

The coastal forests around Port St Johns and the inland ravines such as Magwa Falls areaare also easier to access, and although generally in relatively good condition they are also under threat from development, illegal logging, dumping and encroachment by development. A 260 ha section of prime coastal forest is protected by the Silaka Nature Reserve

Figure 13: section of coastal Forest above the town of Port St Johns.

south of Port St Johns.

The endemic Mkambati palm only occurs in an extremely limited 47 ha area of the Indian Ocean Coastal Belt along the northern Pondoland coast, and is currently afforded some protection by the 7400ha Mkambati Nature Reserve.

2.2.5 Faunal representation

The biomes and habitats described above provide a habitat for a range of small and medium sized mammals, rodents, reptiles, amphibians and birds. The range of animal and bird species found in the area, despite not being as 'illustrious' as the Big Five, provide an indicator of the good biological diversity of the area. Common mammal species include the Grey and Water mongoose (*gxalashe*), Cape Clawless Otter, Black-backed Jackal, Rock Dassie, Mountain Reedbuck, Hares, Baboons, Porcupine, and Striped fieldmouse. The Grey and Mountain Rhebok are commonly seen in the area, withthe shy Oribi occasionally seen. The scarcity of small and medium buck species is attributed to hunting with dogs, and the presence of herdboys and livestock in the remote mountain areas which would normally provide a safe habitat for such animals. The use of caves in the mountains for several months each year for initiation purposes may affect the presence of small mammals. Very few mammals, or evidence thereof, was observed at such caves.
The old Ntsizwa mine apparently has two a resident rare horse shoe bat species, which are receiving some attention and limited protection from the KZN Bat Working Group. These unusual mammals are under threat from mineral prospecting activities in the area, a permit for which has been granted by DMR.

Common snakes in the area include the Puff Adder and Rhinkals, with the venomous Mambas and boomslangs in the more tropical areas along the coast. Snakes are often encountered by rural people on footpaths and when collecting wood. Superstition of reptiles and amphibians results in fear and frequent destruction when encountered.
A range of insects, frogs and lizards have been observed, indicating a healthy diet available for the mammals and birds in the area, as well as being a reflection of a good localised habitat. These species are listed in detail in the MPAH ecosystem profile.

A wide range of bird species, including many raptors, can be found in the areas of lower settlement density, especially along riverbanks and in mountainous cliffside areas. Forested areas also provide a habitat for a slightly different range of birds from those inhabiting the grasslands. Observed birds include larger raptors (Black / Verraux's Eagle, Cape Vulture, Jackal Buzzard and Secretary Bird) as well as Rock Kestrels, Black shouldered kites, Yellowbilled Kites and Storks. Bustards, Francolins, Egyptian and Spurwing Geese, Ibis, Cisticolas, Guinea Fowl, Doves, Swifts and Swallows were also observed. Breeding pairs of three endangered crane species endemic to southern Africa (Crowned, Blue and Wattled cranes) have been observed over several years in the Cedarville and Ongeluksnek wetlands, and Crowned Cranes have been sited in the Ongeluksnek valley on frequent occasions. The Cape Parrot (isikhwenene), critically endangered in South Africa, apparently has some healthy breeding populations in the Ntanbankulu forests but this remains to be verified.

Diversity appears to increase with distance from settled areas, with the lower village areas having a far more limited presence of indigenous mammals, flowering plants etc than the higher lying areas in the more remote northern areas. The use of many wild species by rural people as part of their diet (birds, rodents, snakes, small buck) does have an impact on the health of these animal populations, and their status is probably on the decrease. A comprehensive analysis would need to be carried out over a period of years in order to determine the exact status and trend of these species. The SA Crane Foundation has been carrying our annual surveys of the locations of breeding pairs of the three crane species, and such data has assisted in establishing whether populations are increasing, and what types of activities pose the greatest threats. Such species indicate the health of ecosystems and their presence and population trends provide a clear reflection of the functioning of larger ecosystems such as wetlands. A decline in populations and spread indicates that an element within the ecosystem is out of balance – this could be due to excessive use of agricultural poisons, an incorrect burning regime or burning at the wrong point in the season.

TABLE 4 : FLAGSHIP ANIMAL SPECIES FOUND IN THE FOCUS AREA			
COMMON NAME	SPECIES NAMES	TYPICAL HABITAT	STATUS
Cape Clawless Otter	*Aonyx capensis*	Riverine areas. Can frequent muddy water as don't rely on sight for hunting crustaceans.	Uncommon and rarely seen. Families observed on upper Umzimvubu river as high as Ongeluksnek nature reserve, and along coastal

			areas near estuaries.
Spotted necked otter	*Lutra maculicollis*	Clear water, soil erosion creates problems as they hunt by sight.	Declining due to increasing sediment load in many rivers.
Caracal / rooikat	*Felis caracal*	Anywhere with sufficient cover, occasionally seen in farmlands near small stock.	Shy and rarely seen
Black backed jackal	*Canis mesomelas*	Widespread. Use old antbear holes for breeding	Fairly common visitor to sheep herds in grasslands, often heard at night but rarely seen
Aardwolf	*Proteles cristatus*	Grasslands, bushveld	Rare. Occasionally seen killed on roads
Small and large spotted genet	*Genetta tigrina & genetta*	Grasslands with bushy / shrubby cover. Frequent areas with poultry. Good tree climbers	Fairly rare, nocturnal. Can be bold around poultry
Striped Weasel	*Poecilogale albinucha*	Mainly grassland but can tolerate other habitats	Common but rarely seen.
African/striped polecat	*Ictonyx striatus*	Wide range especially grasslands	Common but rarely seen
Large grey mongoose	*Herpestes ichneumon*	Prefers riverine areas	Common
Water mongoose (igxalashe)	*Atilax paludinosus*	Aquatic areas (river banks, wetlands, dams)	Common. Often accused of taking lambs.
Slender Mongoose	*Gallerella sanguinea*		Fairly common in grasslands
Porcupine	*Hystrix afriaeaustralis*	Wide range. Known to raid potato crops	Unknown
Mountain Reedbuck	*Redunca fulvorufula*	Mountainous areas with water and bush	Protected. Seen on roadsides and verges
Grey Rhebok	*Pelea capriolus*	Hilly areas and grasslands	Protected, as above, but fairly common in green feed in spring
Baboon	*Papio ursinus*	Forested and mountainous grassland areas. Wide habitat tolerance, but requires drinking water.	Common in South Africa, with only several troops left in the Alfred Nzo District, mainly in nature reserves with occasional solitary males on farmlands.
Vervet monkey	*Cercopithecus aethiops*	Bushy warmer areas, forest margins	Common in SA, especially in forested areas along coast
Hare / Rabbit	*Lepus species*	Widespread, generally in grasslands and cultivated areas	Common
Rock Dassie / Hyrax	*Procavia capensis*	Rocky areas with protection from predators. Can inhabit erosion gulleys.	Common
Aardvark	*Orycteropus afer*	Wide range but prefers grassland trampled by cattle as this makes grass available for termites, their main food source.	Widespread but rarely seen. Ground burrows common in grasslands, provide homes for other mammals
Rock dassie / hyrax	*Procavia capensis*	Rocky outcrops and cliffs in grasslands	Occasionally seen, shy
Leguaan / water monitor			

Black and blue wildebeest have been stocked at nature reserves in Matatiele, and several game farms in the Cedarville area stock Blesbok.

A list of birds found in the sub-region is appended, along with amphibians and reptiles.

2.2.6 Protected areas

The CSA Umzimvubu Corridor has just over 28 000 hectares (1%) of formally protected land based area in six reserves, under the custodianship of provincial and local authorities, listed as follows:

TABLE 5: PROTECTED AREAS IN THE UMZIMVUBU CATCHMENT			
NAME	**MUNICIPAL AREA**	**SIZE IN ha**	**AUTHORITY**
Mkambati Nature Reserve	Nqhuza hill / Quakeni	7 432	ECPTA
Mt Currie nature reserve	Kokstad	1 800	KZN ezemvelo
Ongeluksnek/Malekhalonyane nature reserve	Matatiele	13 787	ECPTA
Matatiele Mountain Lake consisting of two parcels	Matatiele	4 800	Matatiele LM
Silaka nature reserve	Port St Johns	263	ECPTA
Umtamvuna nature reserve	Mbizana	45	

*Mhlontlo local municipality has a 1370 ha reserve which is located outside of the focus area, near Mthatha.

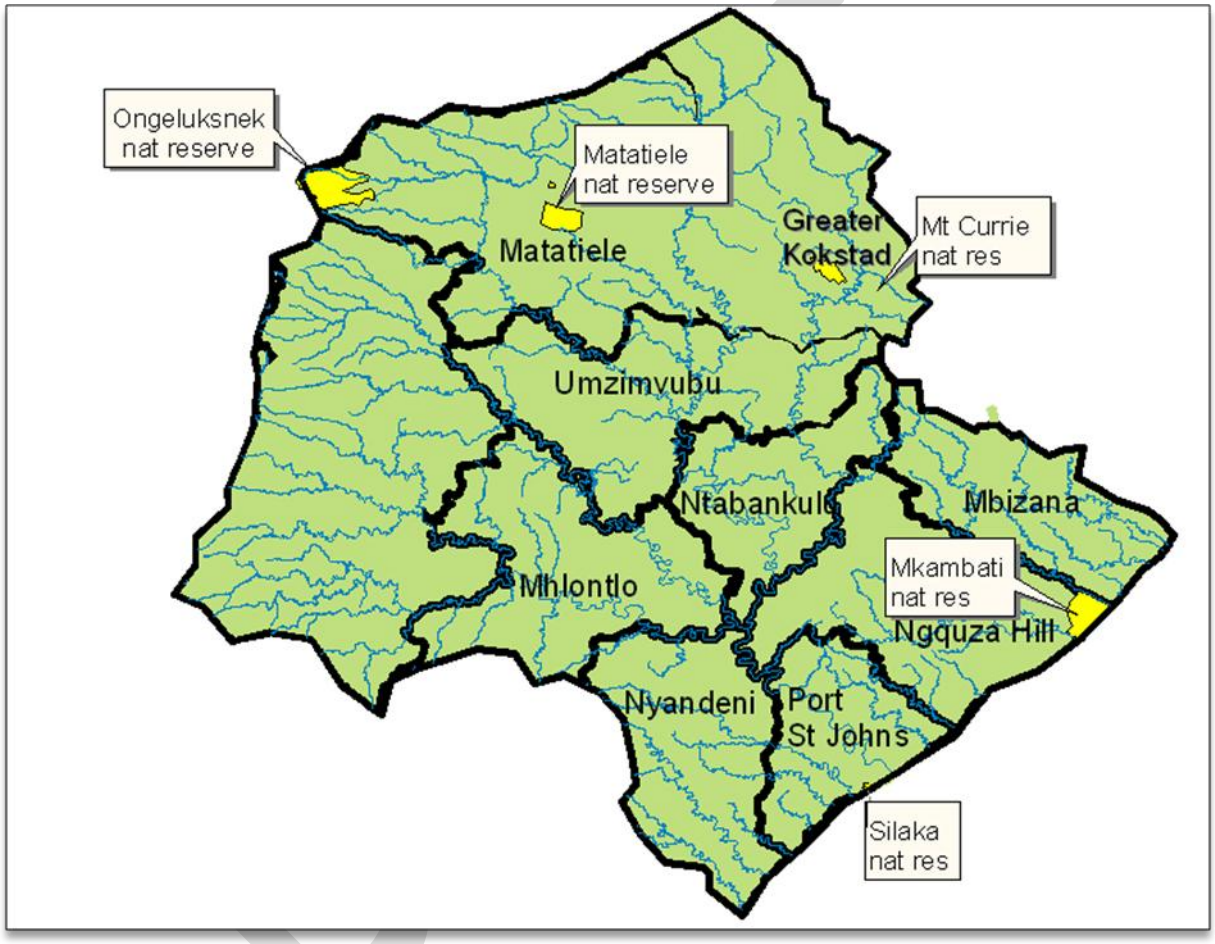


Figure 14: location of protected areas in Umzimvubu catchment

While KZN Ezemvelo, the protected areas and biodiversity custodian for that province, has jurisdiction beyond the formal nature reserves, this function is split in the EC: the provincial department of Environemnt Affairs (DEDEA) has a biodiversity protection mandate outside of protected areas, with the EC Parks & Tourism Agency restricted, in a sense, to its protected areas. However, ECPTA has a People & Parks section which has made impressive efforts with respect to relationships between their parks and the surrounding communities, although many of these efforts are beleaguered by unresolved land claims.

Challenges within the protected areas include poaching, illegal grazing, alien encroachment, understaffing and lack of public awareness about the function and purpose of such areas.

2.3 Hydrology and Freshwater systems

2.3.1 Catchment description and classification

The Umzimvubu sub-catchment forms the northern portion of WMA12, which has the highest mean annual runoff in SA, comprising nearly 15% of total river flow in country. 40% of this is from the Umzimvubu system, which is shown below in figure 12. Surface water quality is relatively good except for high turbidity in flood flows – the major water quality impact is excessive sediment run-off as a result of poor land management, which is classified as degraded mainly due to overgrazing (CES joint venture, 2006).

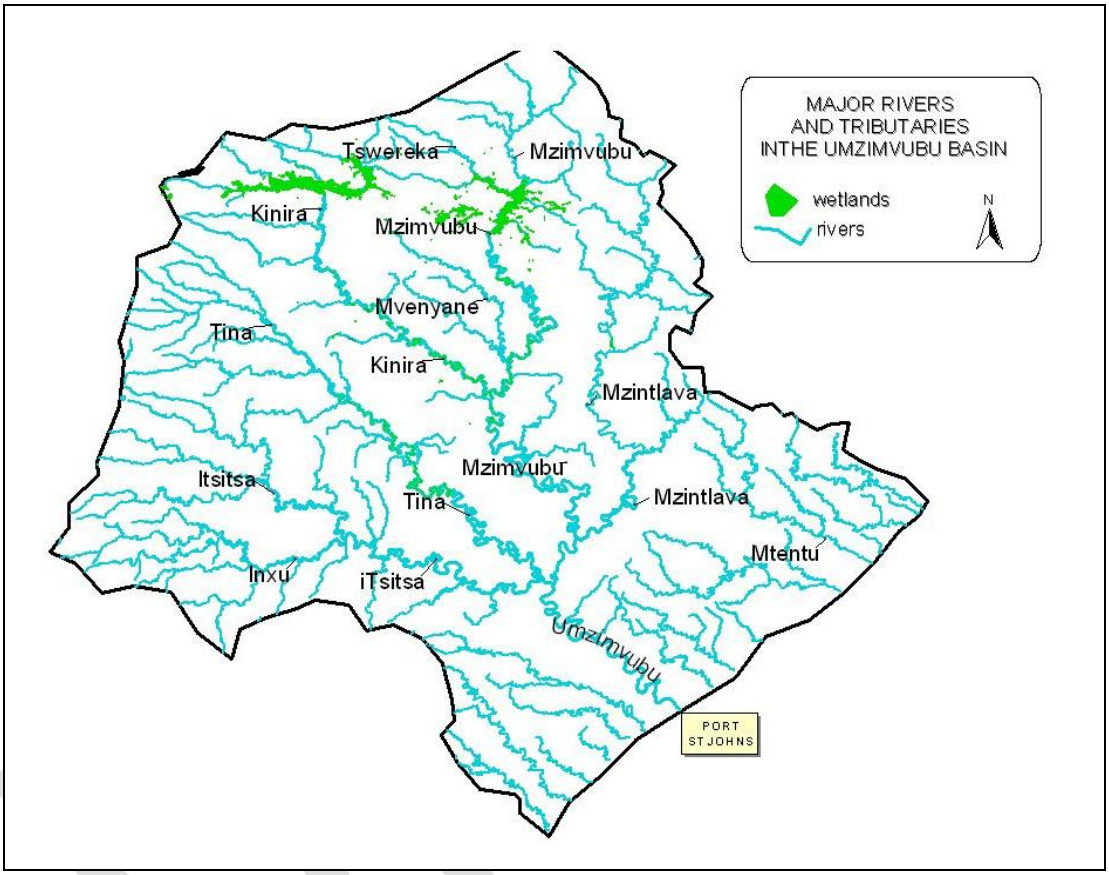


Figure 15: tributaries of the Umzimvubu river drainage system from source to sea

The Drakensberg forms the main watershed along the northwestern boundary, with the Mvenyane- Nungi –Ntsizwa dolerite mountains forming a northwest – southeast watershed in the centre of the area. The sub-catchments are generally in a fair condition, with the largest problem being erosion and loss of topsoil. South Africa loses an estimated 400 tons of soil per year through run-off, mainly through poor agricultural practises. The widespread surface erosion and high silt load in the area's river systems is highly likely resulting in soil loss figures higher than the national average. The recent SANBI 4 year PES business plan indicates that restoration of upper quinaries in the Umzimvubu area could decrease silt loss by up to 4,9 Mm^3 per annum .

2.3.2 Rivers and streams

The Umzimvubu River rises as a small mountain stream from the montane grasslands and wetland seeps in the northeastern corner of the drainage basin. It flows south through the Cedarville flats, being sustained by a complex network of wetlands and creating a wide alluvial plan, often flooded in summer and providing a wonderful habitat for a wide range of waterfowl. Despite its slow meandering nature along the Cedarville flats, the Umzimvubu has a high silt load, attributed to the numerous road crossings and cultivation along its banks and in its catchment. The many perennial streams which constitute these tributaries rise as mountain streams against the watershed, and are of

excellent water quality, providing a source for gravity-reticulated water supply schemes to many villages, with little need for treatment of the already potable water. However, much of the upper catchment riverine habitat has been severely infested with alien plants, primarily black wattle (*A. dealbata*) which causes problems with bank stability and access, reduction in base flows and damage to downstream infrastructure during flood events, with the latter costing the authorities millions in repairs.

☑ There is much scope to reduce this through support for appropriate alien management in the upper catchment, through collaboration with roleplayers such as WfW, SANBI and the voluntary upper Umzimvubu catchment team.

The Umzimvubu is joined halfway down its seaward journey by four major perennial tributaries, the first being the Kinira which drains the main escarpment with Lesotho, as well as the Tina and Tsitsa to the west and Umzintlava to the east. The river reaches sizable proportions after the confluence of these four tributaries in the Lower Umzimvubu area, approximately 120km from its source, where the impressive Tsitsa Falls can be found near Shawbury Mission. The river plunges on south through some deep gorges inthe Lower Umzimvubu area before reaching Pondoland and the Indian Ocean at Port St Johns, where its estuary is often almost closed with its huge silt load. A large silt deposit can be seen for a kilometer out to sea during summer months after heavy rainfalls.

Figure 16: (clockwise from top left) streams in the upper Kinira catchment East Griqualand grasslands produce potable water; Nkanje stream near Mt Ayliff forming a tributary of the Umzintlava; the impressive Tstitsa falls near the start of the Uzmivubu gorge through valley bushveld; view east of the Umzimvubu mouth through the coastal forest covered 'heads' at Port st Johns

No major in-stream dams occur along the main rivers mentioned above, with the only dams of any significant size being the dams of Belford (on the Mafube river north of Matatiele) and Ntenetyana (on a small tributary of the Kinira

north of Mount Frere). Some remnant catchment dams exist in the Ongeluksnek valley and on the commercial farms in the Cedarville flats margins, but this is not a common practice in traditional farming systems.

Figure 17: aerial view courtesy Google Earth of the mouth of the Umzimvubu at Port St Johns, showing the extent of silt deposition into the Indian ocean.

Figure 18: silt laden Kinira river approximately 70 km from its source

Figure 19: Ntenetyana dam north of Mt Frere – note the extreme wattle cover and active encroachment in the small catchment which constitutes a huge threat to the water supply for Mt Frere town and surrounds.

2.3.3 Wetlands

The Umzimvubu corridor has two main wetland areas in northern and eastern areas, namely the e Ongeluksnek area in the north (T33) and the upper Umzintlava (T31) in the north east. The Matatiele Municipality alone has in excess of a staggering 30 000 hectares of wetland. The name 'Matatiele' derives from 'matata aiele' and means 'the ducks are gone', reflecting the rich waterfowl presence in the area.

Apart from the alpine wetlands in the Ongeluksnek Nature Reserve, few of these wetlands fall within conservation areas, whilst the wetlands along the Ongeluksnek and Cedarville valleys are subject to a fair degree of abuse through farming practises, trampling by livestock and drainage by old furrows which irrigated lands in the past. These wetlands provide an important habitat for waterfowl, especially ducks and cranes, the latter being endangered. Their presence as an indicator is discussed under section 2.4

The primary function of a wetland is the storage and filtering of water, and as such their presence in the upper catchment is of vital importance to the health of the larger catchment, ensuring year round basal flows and the mitigation of downstream flood damage.

Figure 2: wetlands in the upper Kinira catchment near Matatiele are subject to land uses which are not compatible with their optimum functioning, such as draining for agriculture, marginal housing and construction of access roads

2.3.4 Springs

The area is peppered with springs, many of which provide the only source of potable water for rural villages. Many of the springs have been captured and protected as sources for small reticulated water supply schemes, sometimes without the necessary permission from the authorities.
Factors affecting spring quality and flow volume include their location (latrines and graveyards can have an obviously adverse effect on quality) as well as the presence of vegetation, especially alien invasives.
The Alfred Nzo District WSA (water service authority) has fairly comprehensive data on water supply schemes and their different sources. Planning for development activities should take into account the location and presence of spring sources. Most of these springs are located at medium to high altitudes and depend on groundwater recharge, which is adversely affected by decreased groundcover.

3. INSTITUTIONAL AND SOCIO-ECONOMIC DESCRIPTION

3.1 Demographic profile

The area is predominantly rural, with a population in excess of 2.2 million people, 85% of whom are living in rural settlements, in an estimated 375 000 households, dependent to various degrees on surrounding resources as a buffer. The population density is estimated at 15 people per square kilometre.

Unemployment is higher than the national average of 27%, with the majority of such residents being grant dependent versus actively productive, with the latter involving passive land use e.g. extensive grazing and 'Massive food' projects driven by the state or para-statals. A degraded resource base produces lower yields for the same inputs, discouraging involvement in agriculture and subsistence activities.

A survey of villages in the upper catchment of the Matatiele area in 2005 revealed a frightening 30% illiteracy rate amongst adults. Over 55% of households are female headed, with most rural households surviving on just over R600 per month, with most income derived from grants. 70% of the respondents indicated they are unable to save. Approximately 70% of people in the upper catchment do not have access to farming land, while almost 25% own livestock, including horses.

3.2 Stakeholders and roleplayers in corridor

3.2.1 District and Local Authorities affected and involved:

As mentioned, the proposed focus area incorporates 9 local municipal areas, within 4 districts, as follows:

a. New Alfred Nzo District which will include 4 local municipalities:
   i. Matatiele
   ii. Umzimvubu
   iii. Mbizana and
   iv. Ntabankulu
b. OR Tambo
   i. Port St Johns
   ii. Quakeni / Nqhuza Hill
   iii. Mhlontlo (eastern portion)
   iv. Nyandeni (eastern portion)
c. Sisonke
   i. Greater Kokstad Local Municipality
d. Joe Gcabi
   i. Elundini Local municipality

Table 4 below shows the relative sizes and relevant data for these municipal areas, including whether they have an appointed environmental officer for their jurisdiction.

TABLE 4: SUMMARY OF LOCAL MUNIICPLITIES IN THE CSA UMZIMVUBU PROGRAMME AREA / SPHERE OF INFLUENCE

LOCAL MUNICIPALITY NAME	AREA ha	population	NATURAL AREA %	TRANSFORMD ha	WETLANDS ha	VEG TYPES	PROTECTED %	ENV OFFICER
Nqhuza hill / Quakeni	247,687	279795	70	30	803	9	3	
Ntabankulu	145,572	141358	80	20	1,384	6	0	1
Elundini	506,444	123636	78.3	22	8,727	9	0	
Umzimvubu	267,982	220631	77.3	23	903	5	0	1
Matatiele	435,231	258758	79.1	21	30,256	8	3.2	1
Mhlontlo	282,614	237138	67	33.4	4,021	7	0.5	
Port St Johns	129,120	165084	74	26	278	12	0.2	
Greater Kokstad	267,983	200,000	75	25	13,906		0.2	1
Nyandeni	247,401	314273	71	29	987		0	
Mbizana	241,672	279739	65	35	523	12	0	1
TOTALS	**2,771,706**	**2,220,412**	**736.7**	**264**	**61,787**	**22**		
% OF FOCUS AREA			**74%**	**33%**	**2%**		**1%**	**5**

3.2.2 State departments and parastatals:

The Eastern Cape has a range of provincial departments with offices and field staff active in the area. Of relevance to a biodiversity intervention are the following:

- DEDEA - Dept of Economic development and Environmental Affairs, provincial office in Bhisho and and regional offices in each District
- DRD&LR – Department of Rural Development & Land Reform, regional office in Mthatha, which includes Agricultural extension and Land Care Programme
- DWA – Department of water Affairs, regional office in East London covers northern Eastern Cape
- DAFF – Dept of Agriculture, Forestry & Fisheries, regional office in Mthatha
- DEA WfW – national office with programmes based at District Municipalities
- ECPTA - EC Parks & Tourism Agency, parastatal under DEDEA provincial jurisdiction
- MDTP – Maloti Drakensberg Transfrontier Programme (??)
- ASGISA EC – provincial office based in East London and promoting large scale economically driven rural development initiatives, including forestry, stock farming, cultivation and hydro power in the Umzimvubu catchment.
- CONTRALESA – congress of traditional leaders, comprised of chiefs from communal lands

KZN has a slightly different system, with environment falling under the mandate of DAEARD (Dept Agriculture, Environment & Rural Development, based in Hilton with regional offices in Ixopo.
DWA and DAFF as national departments have regional offices are based in Durban.
The land tenure system is quite different from that of communal lands in the Eastern Cape, with such areas falling under the custodianship of the Ingonyama Trust, rather than DRD&LR as in the EC.

3.2.3 NGOs and private sector:

Although not many NGOs are based in the area, there are several national institutions which operate in the area, including:

- **SANBI** (based in Cape Town with a regional office in east London supporting the Eastern Cape.
- **WESSA** – based in Howick in KZN, with outreach through their Ecoschools programme to several rural schools in the subregion and a Border Kei branch in East London.
- **Wildlands Conservation Trust –** CEPF regional implementer, based in Howick
- **Endangered Wildlife Trust** – Drak Crane project , based in KZN midlands
- **WorldVision –** food security promotion**,** has an office in Matatiele and Kokstad. Limited information could be accessed from the office.
- **LIMA**, the agricultural support group has a very active office in Matatiele which covers the sub region, including all the wards in Matatiele, providing support for rural subsistence production including tree planting. They also manage a Community Works programme under the EPWP (Extended Public Works Programme) approach which includes some rehabilitation work.
- **Save Act** , a savings and credit NGO based in PMB with an active office in Matatiele providing support to rural savings clubs, and moving into agricultural support for these clubs.
- **Mehloding Communtiy Tourism Trust –** a registered trust operating since 2002 which owns and manages the Mehloding Trail and Masakala traditional guesthouse. Also involved in associated development activities along the trail area, including alien plant management and erosion control for trail maintenance.
- **EDA Matat –** a remnant of the old EDA Trust which was a leading rural development advocacy group in the 1980s and 1990s, still has a small office in Matatiele providing facilitation support to general development initiatives
- **Cedarville-Mvenyane Farmers Association** – voluntary association which represents the commercial livestock farmers in the area.
- **R3G** – group of researchers promoting restoration and rehabilitation best practise in the Pondoland and mid Umzimvubu area.
- **Singilanga Directorate Trust** – established to benefit communities linked to Merensky timber developments in areas with existing plantations , plus potential new areas in Alfred Nzo and Pondoland areas. Exploring conversion of wattle to plantations as a biomass marketing opportunity. Linked with a commercial / arm called **Zange Industries Pty ltd** established to drive the business side of processing plantation products from trust lands. Singilanga Trust is the majority shareholder.
- **Biotech fuels** has a head office in Cape Town and new processing plant in Howick in KZN; exploring biofuels processing, currently using 350 tons daily, looking for sources including alien biomass, with Alfred Nzo area a key target with a known 4000ha alien plants. Linked with CSIR for evaluation of the feasibility of bamboo

production as a longer term source. Produces a high tech pellet which has potential to replace coal, as a climate change mitigation effort.

- **DBSA Drylands Programme** has provided support from their national office in Gauteng, and is integrating environmental conditions from RoDs into their loan agreements with water service authorities including Alfred Nzo District Municipality. Supportive of local efforts to co-ordinate upper catchment management interventions.
- **Sustaining the Wild Coast** – development organisation focussing on the northern Pondoland area

Table 5 shows the range of potential stakeholders and their contact details.

Details of stakeholders and discussions can be found in the summary document titled 'Stakeholder Engagement Record'.

TABLE 5: KEY INSTITUTIONS AND STAKEHOLDERS ACTIVE IN THE FOCUS AREA

STATE & PARASTATAL

INSTITUTION	AREA COVERED	OFFICES	INFORMATION & CONTACT DETAILS
DEDEA (Eastern Cape)	Each EC District has an office under the provincial Department	ANDM – Maluti OR TAMBO – Mthatha JOE GCABI - Queenstown	ANDM Regional Directors M. Kosi and C. Theron; OR TAMBO Regional Director S. Gabula 047 531 1191; Bisho 040 609 4703;
DRD&LR	Northern eastern cape (former Transkei) part of focus area covered by Mthath and Queenstown regional offices. Provincial department covers both land affairs / tenure issues as well as agriculture. Covers Landcare programme very active.	Provincial office in East London, regional in Mthatha and Queenstown. Local Agricultural extension services based in Matatiele and Maluti, with Landcare programme based in Kokstad.	Mthatha 047 532 5959 Kokstad Landcare section 039 727 1640
DWA	Entire province falling under eastern cape region, under national line department.	Based in East London, with area office in Mthatha. No local office.	East London 043 701 0376
DAFF	Entire province falling under eastern cape region	Based in East London, with area office in Mthatha	Mthatha 047 532 2283 6081
DEA WfW	national office with programmes based at District Municipalities. Now falls under DEA not DWAF.	Head office still Cape Town? District offices operated through implementers, including IDT in Alfred Nzo	Gawie Naude Elundini 082 897 9555 Mr Mdoda /Nqayi Alfred Nzo 083 429 7756
ECPTA	22 reserves in Eastern Cape, including 3 in focus area. Reserves located at source and end of catchment, providing possible linkage opportunities?	Based in East London, staff at each reserve (Mkambathi, Ongeluksnek, Silaka)	East London head office 043 701 9600 / 742 4450
MDTP	Based in DEDEA provincial office. Covers upper catchment including Matatiele through to KZN Drakensberg, linked with Lesotho over escarpment	East London?	Rabson Dhlodhlo
CONTRALESA	Each admin area within communal lands area is under jurisdiction of a Chief and the DRD&LR. Fall under Local Government and Traditional affairs in Bhisho (DLG&TA)	None but local chiefs of area are contactable and involved in development activities	DLG&TA 040 635 0599 fax Chief Jeremiah Moshoeshoe 083 394 3876 Chief G Lebenya 082 385 3889
ASGISA EC	promoting large scale economically driven rural development initiatives, including forestry, stock farming, cultivation and hydro power in the Umzimvubu catchment	provincial office based in East London and	Stephen Keet (Forestry) 043 735 2735 Chuma
DBSA Drylands Programme	national office in Gauteng, integrating environmental conditions from RoDs into their loan agreements with WSAs including Alfred Nzo DM	NO local branch but seconds staff to District, including Alfred Nzo	Julie Clark head office 082 909 4637 Justin Luphindo at Alfred Nzo 039 254 5000

NON GOVERNMENT

INSTITUTION	AREA COVERED & OFFICES	INFORMATION & CONTACT DETAILS
SANBI	based in Cape Town with a regional office in east London supporting the Eastern Cape	Andile Mangcengeza 043 705 4460 / 043 722 6673

WESSA	based in Howick in KZN, with outreach through their Ecoschools programme to several rural schools in the subregion and a Border Kei branch in East London	033 330 3931
Wildlands Conservation Trust	CEPF regional implementer, based in Howick	Roellie Kloppers / Dumile Tshingana 033 343 6380
Endangered Wildlife Trust	Drak Crane project , based in KZN midlands. Raptor Working Group supporting vulture hide in Ongelukskek. Keen to collaborate regarding crane custodianship on private lands, as well as communal awareness outreach support in Ongeluksnek valley.	Tanya Smith 033 330 6982
Save Act	Based in PMB with an active office in Matatiele providing support to over 22 rural savings clubs, which have potential to provide a basis for PES-type stewardship co-operatives.	Nolufefe 039 737 3409 Anton 033 345 1222
UKZN School of Geography	Based in PMB, involved in range of relevant activities, including catchment management research, stewardship methodologies, GIS support, PES methodologies, etc.	Prof Trevor Hill 083 650 0051
WorldVision	food security and rural development promotion. Has offices in Matatiele and Kokstad. Head office in JHB.	Siyanda 039 737 3376
LIMA	Head office in Dorpspruit; agricultural support group has an active office in Matatiele which covers the sub region, providing support for rural subsistence production including tree planting, community works and landcare type activities. Very supportive of exploring PES stewardship by communal co-ops as an exit philosophy for their current CWP.	Phumelele Ngcobo 039 737 3627
ASAP	African Solutions for African Problems – based in Cape Town, with local outreach for OVC care through sustainable gardens and feeding support in Matatiele area	Priscilla Higham tel: 021 788-2642 fax: 021/788-2705
EDA Matat	has a small office in Matatiele providing facilitation support to general development initiatives in sub region	
Mehloding Trust	Community based tourism enterprise operating a hiking trail along the Matatiele /Lesotho escarpment. Facilitate alien clearing and related activities in upper catchment. Have received funding form LOTTO and DEAT.	039 737 3289
R3G	group of researchers promoting restoration and rehabilitation best practise in the Pondoland and mid Umzimvubu area	Dr. Ayanda Sigwela
Singilanga Directorate Trust	communities linked to Merensky timber developments in existing plantations , plus potential new areas in Alfred Nzo and Pondoland areas. Links to BioTech energy company which seeks to source sustainable biomass supplies for pellet production.	Allan Bangay 083 380 4445
Cedarville – Mvenyane Farmers Association	Commercial farmers based in Matatiele area, includes mainly beef, with some dairy and livestock crop production. Some members have formed a conservancy. Covers area of approximately 250 000 ha, including large irrigation areas	Kenny Biggs 082 770 6618
Cedarville Conservancy	Group of farmers in Cedarville area forming conservancy which covers over 10 000 ha, have accessed small grant from CEPF via WCT	Robert Rawlins 083 243 7771
TransCape	NPO based in Coffee Bay area, promoting locally driven economic enterprises based around ecotourism, including preschools, HIV education, clinic support, etc	Hyman van Zyl Johann Stadler
DBSA Drylands Programme	national office in Gauteng, and is integrating environmental conditions from RoDs into their loan agreements with water service authorities including Alfred Nzo District Municipality. NO local branch but seconds staff to District, including Alfred Nzo	Julie Clark 082 909 4637 Justin Luphindo at Alfred Nzo 039 254 5000
Sustaining the Wild Coast	CBA based in Bizana facilitating stewardship and environmental activities inthe northern Pondoland area.	Sinegugu / Mzamo

4. THREATS AND OPPORTUNITIES IN THE UMZIMVUBU CORRIDOR:

4.1 Key Threats and Opportunities

The following summarises the existing threats and potential restoration and conservation intervention opportunities for CSA within the Umzimvubu Corridor:

BIG Red Flag: Alien Species Invasions

Alien plants constitute a major threat to the Umzimvubu catchments and riparian zone. Alien species reduce surface water availability, posing a threat to community and urban water supply schemes especially in the Alfred Nzo District in the upper catchment. Additionally invasion by alien vegetation leads to a loss of natural habitats such as grassland and river banks, and change in ecosystem flows and functions through reduction of basal flows. The biggest problem posed is through alien invasion of riverbanks, especially by wattle (*Acacia dealbata and mearnsii*), which results in the loss of natural bank vegetation and increased bank erosion and scouring during floods. Alien clearing operations through the Working for water programme have initially been effective, but follow up is essential, and requires substantial funding. Clearing operations which leave biomass in or alongside the river course can create problems during floods through artificially increasing the flood load, causing damage to bridges and leaving some riverine areas impenetrable after the load has been deposited.

Alien plants often act as pioneers, and opportunistically invade disturbed areas where natural vegetation has been removed through poor management. In the invaded communal landscape of the Umzimvubu, the impacts of invaders are inextricably linked to those of other anthropogenic influences, particularly grazing and settlement patterns. They are often inedible to livestock, and enjoy a competitive advantage over indigenous plants. Certainly, wattle invasion is taking place on the margins of healthy grassland in the upper and central Umzimvubu corridor, and poses a direct threat to the competitiveness of indigenous plants.

The most prevalent alien plants in the Umzimvubu Corridor are the black and silver wattle (*Acacia mearnsii* and *dealbata*), found in the form of shrubby growth and mature trees. Wattle occurs at all altitudes and in all environments, making it extremely successful. The WFW programme has done extensive mapping of the areas targetted for clearing Figure 10), but a wide range of unmapped areas exists right across the corridor (e.g. Figure 11).

Figure 20: uncontrolled spread of wattle in the Drakensberg Foothills grasslands in the Ludidi area north of Mt Frere

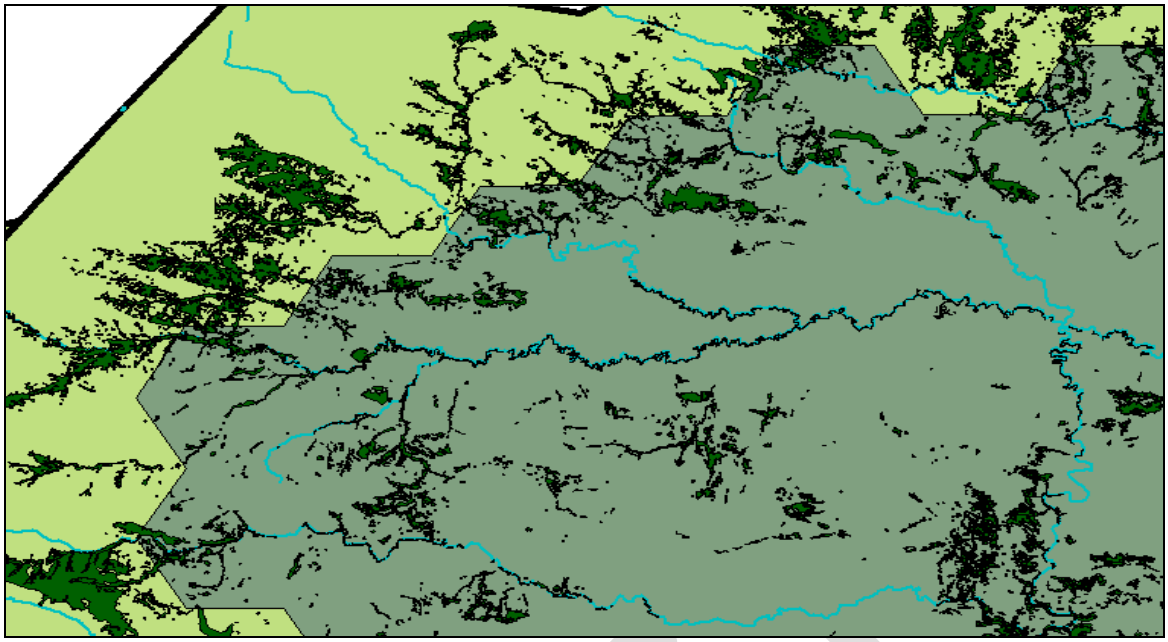


Figure 21: GIS snapshot of the top left corner of the focus area, in the upper Kinira catchment in T33, showing the extent of wattle invasion, shown in dark green overlain on the Highlands Grasslands corridor (olive green)

The key alien plant species constituting a threat in the corridor include the following:

TABLE 6: PREDOMINANT ALIEN PLANT SPECIES FOUND IN THE UMZIMVUBU CORRIDOR				
SPECIES NAME	**COMMON NAMES**	**EXTENT**	**CATEGORY**	**PRIMARY LOCATIONS**
Acacia mearnsii	*Silver wattle*	*widespread*		*Disturbed areas, roadsides, old stock tracks, riverine areas, warm and cooler climates*
Acacia dealbata	*Black Wattle*	*widespread*		*Disturbed areas, roadsides, old stock tracks, riverine areas*
?	*Bugweed*	*localised*		*Degraded areas along roadsides*
Cassia spp	*Peanut butter bush*	*Localised*		*Warmer areas and along roadsides, mainly in central and southern areas*
Salix fragilis	*Crack willow*	*localised*		*River banks*
Populus spp.	*Poplar tree*	*localised*		*Damp areas and riverbanks*
?	*Tree daisy*			*Warmer moister areas along roadsides, especially in Port St Johs area.*
Psj				
	Lantana			*along coast*
	Mauritius thorn			
Plantation species such as Pinus and Eucalyptus.				

☑ Opportunity exists for CSA to facilitate new models for alien clearing across a range of socio-economic and partnership models. These models can be linked in with Biodiversity and Red Meat contracts to promote holistic land management that can support long-term ecosystem service payments or alternative livelihood development from innovative use of biomass (alien wood) resource.

Cultivation:

Estimated to be the greatest threat to biodiversity through habitat destruction, ploughing physically destroys grassland and removes natural groundcover, simultaneously increasing run-off and silt loss especially during unplanted periods. Traditional animal draught methods are preferable to mechanised cultivation (tractors, balers and combine harvesters) as the soil is not crushed, longevity of the land is increased and erosion potential is reduced. Historically, the low intensity traditional methods used in the rural areas of the former Transkei have allowed for lower impacts, but the practise of contour ploughing is often neglected, resulting in sheetwash and gully erosion. The use of mechanised cultivation is increasing, especially through the promotion of state driven 'massive food' programmes, where productivity is prioritised at the expense of resource sustainability. Once topsoil is lost, the original grassland can never recover, and erosion becomes a permanent feature where grassland once existed. Combined with dispersive soils, this has resulted in wide spread destruction and loss of biodiversity. The Agricultural Research Council estimates that an average of 50 tonnes of soil per hectare are lost per year in the catchment. The in-stream erosivity and impacts of this high silt load on coastal areas add to the high cost of these losses, where productivity decreases and input costs increase.

Figure 21: former cultivated lands are no longer productive due to loss of topsoil, and actually constitute a dis-service to the ecosystem and catchment functions.

In the 440 000ha commercially farmed area in the upper Umzimvubu, near Cedarville and Matatiele, which constitutes almost 20% of the focus area, establishment of dairy pasture has had a major impact with respect to transformation of indigenous grasslands through conversion to perennial rye grass lands with year round irrigation and fertiliser addition. Although not ploughed annually, this new use results in complete loss of habitat and biodiversity, plus long term trampling, increased water use and increased phosphate-laden run-off into adjacent water bodies, causing eutrophication of the latter. The impacts on basal flows are undetermined at this stage. It is estimated (CSA dairy ref) that the full life cycle for the production of one litre of milk requires almost 1000 litres of water, much of which is incurred through production as outlined above. The need to intensify commercial agriculture in the context of milk markets and dairy board influences highlights the need for policy level intervention and demonstration opportunities through Green Choice initiatives. Progressive dairy groups in nearby Eston in KZN have initiated an organic dairy certification system, while others have developed biogas harvesting plants from diary waste, both of which could be trade-offs for the loss of habitat and function through land transformation from extensive grazing to intensive dairy green-feed.

Figure 22: transformation of grassland into cultivated dryland and irrigated pastures, between Matatiele and Cedarville, mainly for dairy and stock feed.

Riparian land use is mainly in the form of cultivation, with settlements rarely occurring too close to riverbanks due to the threat of seasonal flooding. Cultivation too close (less than 30m) to riverbanks is not common but does occur, especially where land users are trying to irrigate vegetable crops in alluvial areas where topsoil is rich.

☑ Possibly an area for Green Choice intervention, to encourage dairy operations in area to become more efficient and lower footprint activities, through water management and biogas / carbon offset and linking to grid inputs. Fits well with 10 Green Choice M&E indicators.

Grazing:
This can be one of the least damaging of land uses IF stocking rates are adhered to, and rotational grazing is practised. This is not always the case however, and the average recommended mixed and sourveld carrying capacity of one livestock unit (cattle) per two hectares is not adhered to. Traditional grazing controls in communal areas have to a degree fallen away with many herdboys attending school, but in some areas local chiefs still exert some control over who grazes their stock where. Livestock are often left untended, and in the case of goats and sheep this is destructive, as they are extremely selective grazers, and will put enormous pressure on the more palatable areas. Such areas can be seen around villages, where often only small unpalatable shrubs survive, having replaced the original palatable grasses.

Grazing in wetlands is a common feature, with such areas providing important winter buffer fodder. This results in trampling and disturbance of wetland-based species especially cranes and amphibians.

The practise of annual burning to stimulate early green growth is prevalent especially in the mountain areas, where herders set fire to grasslands in an attempt to force early growth after a lean winter's grazing. Whilst fire is part of the natural regime of grasslands, and constitutes an important management tool, its frequency can make or break grassland vigour and productivity. Annual burning is extremely destructive, and eventually reduces groundcover through reducing soil moisture and hampering long term growth through grasses using their reserves too frequently, and not establishing sufficient root spread or depth. The frequency for burning varies with stocking rates, but it is recommended that not less than a three year cycle be followed for most of the grassland in the corridor.

The beef industry in East Griqualand (the upper Umzimvubu region of Matatiele to Kokstad) is well developed, with most farmers, both commercial and communal, free range grazing. There are two productive abattoirs in Kokstad and Matatiele plus a goat processing unit in Mt Ayliff (established by the Alfred Nzo Municipality in 2007) which is currently not functional due to supply and management problems. Several commercial farmers have been exploring ways to improve grazing productivity through changing fire and seasonal grazing regimes, and have increased carrying capacity and stocking rates. Perverse policies like the grading of beef according to carcass size works against the more beneficial free range grazing system, whereby fast-grown feed-lotted beef is graded A, with larger grass fed carcasses graded B and C (largest) based on suitability for product size.

☑ This is a potential policy influence area, which would receive support from both the commercial and communal beef farmers in the area. Expanding extension and providing incentives/opportunities to reduce opportunity costs for transitioning to better rangeland management practices through a Biodiversity and Red Meat Initiative approach exists as a good, low-hanging opportunity in the region.

ASGISA-EC has a new initiative to support communal beef farmers with improved breeding stock to increase livestock resilience and productivity. The traditional NGUNI cattle so common in the rural areas of the Eastern Cape have added value in terms of their sought-after hides.

☑ The establishment of an abattoir and marketing system for free range / responsible beef, through a Green Choice-based programme, could be an excellent mechanism to incentivise livestock farmers to improve stewardship of grasslands throughout the catchment, especially in the upper reaches. Both communal and commercial farmers stand to benefit from improved grassland quality and beef production market and policy support.

Forestry

New commercial afforestation is planned for an estimated 30 000 hectares in the northern portion of WMA12 (Forestry Road map, DWAF, 2009), with established gum and pine plantations in the Umzimkulu, Ntsizwa, Mvenyane and Mkambati areas having long ago changed the original grassland habitat. Forestry is recognised as a stream flow reduction activity and requires licensing by DWA. It constitutes a threat to grasslands and their function, through removal for plantation establishment. It is estimated that a 100hectare mature gum plantation can consume on a daily basis the equivalent of a small town with a population of 5000 people (FSC, 2009).

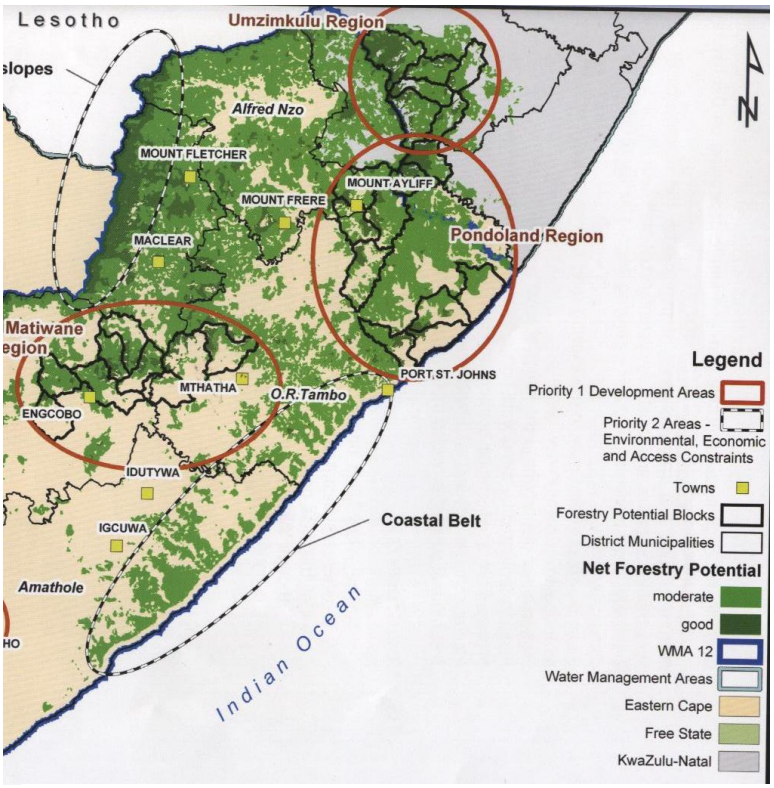


Figure 23: extract from WMA 12 SEA, showing potential target plantation development areas

There appears to be increasing pressure from forestry companies to acquire land for expanding their plantation areas to meet the global timber shortfall, with little incentive for old category B plantations and damaged wattle invaded land to be revitalised and made productive as plantations. ASGISA EC has played an active role in promoting feasible and responsible forestry development, mainly through screening proposed applications for their business viability, and making commentary into the EIA process. There is much dispute as to the actual long term benefits of commercial forestry development on communal grassland, with DAFF and ASGISA-EC promoting the application for new sites under the land rights holders' 'ownership' in partnership with companies such as SAPPI and Merensky Holdings. Forestry can be a source of alien plant spread – this is discussed further later in the document. The main areas targeted are the Matatiele foothills and lowlands, which have moderate potential, with the priority area being from Mt Ayliff southeast through Pondoland. Figure 10 shows the proposed target areas identified through an SEA done for WMA12 in 2008.

Based on the possible award of up to 40 000 ha of forestry permits, Merenksy has formed the Singilanga CommunityTrust for communities affected by existing Merensky plantations and these potential developments. The Trust has been established to manage and optimise on economic opportunities, with links to private partnerships. One of the key interests at this stage is the use of wattle infested land, as well as sale of cleared alien biomass and non-productive timber waste to biofuel companies for production of fuel pellets for export and possibly local use, with potential carbon off sets and sale to the national grid (pers. comm. Allan Bangay, Singilanga Chairperson). The UK based energy company, BioTech, which has its main plant in Howick, is negotiating rights to the timber and wattle on lands falling under management of the Singilanga Trust. The income from such sales has potential to fund alien clearing and removal of obsolete timber stands in the upper catchment, and should be seen as a possible source of income within the PES model adaptation thinking.

☑ **Opportunity to collaborate with Singilanga Trust on bio-fuel promotion using alien biomass.**

Agri-chemical, waste, and sewage pollution

Population growth, increased economic activity and intensification of land use practices in the Umzimvubu River Basin are increasingly degrading the resource. Pollution through solid and liquid waste is increasing with domestic and commercial sewage, agricultural runoff, and litter all contribute to the deterioration of the quality of water within the Umzimvubu and its tributaries. Although details for Umzimvubu were not found during this scoping process, the DWA reports to Parliament this year indicated that the majority of South Africa's rivers are unsafe for drinking or recreation (DWA annual report in MSB research). The Eastern Cape is cited as one of three Provinces that have major problems with Total Dissolved Solids. Most of South Africa's rivers have eutrophication problems and the Umzimvubu system is no exception. Experience from ERS assessments are increasingly indicating wetland conversion and deposition of effluents are polluting the ground and surface waters, and changes in habitat have affected the biotic diversity of freshwater ecosystems, impeding their ability to dilute pollutants.

The National Department of Water Affairs (DWA) has commenced a successful drinking water quality and sewerage management programme called Blue Drop / Green Drop, which has provided clear guidelines, monitoring systems and achievable targets for Municipalities to improve waste water management. The programme has a long road ahead, but current indicators show that great progress has been made in the first two years of the programme. The innovative process highlighted a best practice approach to regulatory support for WSAs: meeting the regulation function through providing consultative auditing, supporting municipalities to provide services while meeting norms and standards, and protecting water resources. The approach has included Incentive based compliance approach, rather than just heavy handed compliance directives (more carrot than stick), and active interface between water **services** and protection of water **resources**

59% of Municipaliites participating in the 2010 DWA BlueDrop assessment were rated as having less than 50% compliance with required standards, indicating the need for massive attention towards improved drinking water quality. The costs of water purification including massive desedimentation.

Disposed waste is also seen as a key challenge to several of the Umzimvubu tributaries proximal to settlements. Opportunities exist to turn this into a potential economic benefit – the Matatiele Local Municipality has recently supported the establishment of two micro enterprises based on paper and cardboard collection and recycling, and is exploring expansion of this to include plastics, glass and tin. The local Pick'nPay branches are assisting with waste collection for recycling, with the company and Matatiele LM indicating willingness to collaborate with a public awareness and SMME support intervention to promote landscape and livelihood improvements.

Figure 24: raw sewage leaking into a stream near Matatiele, due to 'broken pumps'

☑ CSA should engage with policy and market development side of pollution control in the Umzimvubu Corridor. Awareness through a medium such as the regional newsletters and radio programmes can support these actions, as well as dedicated training for officials and guidelines and enforcement on agri-chemical and raw sewage disposal. The creation of a small grants fund that can support SMME activities that improve river health and clean up can also be explored.

Dams and irrigation

There are no major impoundments, with the exception of Ntenetyana dam north of Mt Frere within the Umzimvubu system, but the Alfred Nzo District Municipality has plans to develop dams to supply regional bulk schemes, and to augment the Ntenetyana dam supply (currently under threat from alien invasion in the catchment) with a transfer from the Kinira river. A large in stream dam is planned onthe Umzimvubu south of the N2, but no details are available at this stage.

The primary results of these dam developments are extensive habitat loss, a decrease in biodiversity and an increase in invasive and pest species. In extreme cases, these can result in ecological collapse of the functioning of the natural systems. The Alfred Nzo District is currently not subject to major water extraction activities such as dams and inter-basin transfer, and the rivers are thus in a fairly stable state from that respect, albeit with very high silt loads.

A large dam scheme is also underway in the Mbizana area to supply a regional bulk reticulation project.

Some perennial streams have reportedly become seasonal and floodplains that rely on regular flooding which has been attenuated become less productive, potentially due to the expansion of irrigation schemes (though also likely to be exacerbated by alien invasive infestations). A recent study on the interactions between groundwater and surface water has been undertaken by GroundWater Africa (Murray et al, 2011) as part of a regional groundwater supply scheme to augment the Matatiele area. The study's interim findings indicate that surface wetlands are not affected by deep aquifer abstraction, but has recommended that monitoring boreholes be closely observed during use of production boreholes to indicate whether surface water in the upper horizons is being affected.

☑ **Need to better understand relationships between groundwater and surface water use and recharge, within the wider hydro-ecological system, through a detailed hydrological study, draft terms of reference for which are included in appendix A. Establishment of a long term monitoring programme linked with SANBI PES work, CMAs and DWA reserve determination could provide vital data on long term hydrological 'patterns' in the context of climate changed induced shifts, informing adaptation strategies for water service authorities. Exploration of aquifer recharge from stormwater excess as well as direct benefits from alien removal programmes can support policy shifts towards EbA for water rather than new dams.**

Roads

Roads have a direct correlation with increased erosion if not properly designed and maintained. Route alignment and construction activities and methods can cut swathes through grassland areas, effectively removing many hectares of groundcover and dramatically increasing run-off co-efficients. Road construction is often the source of gully erosion due to creation of concentrated run-off from improperly designed road drainage systems. In addition, road cuts are left bare resulting in extensive rill erosion which compounds to form gully erosion as the volume, speed and silt load of run-off water increases. There are few SABS and ISO quality control specifics which facilitate responsible ecosystem-based road and drainage design, with the result that roads very often compound run-off problems and disaster events. Environmental practitioners fight a losing battle against contractors, engineers and municipal infrastructure officials regarding road alignment, design, construction and indeed the actual need for new roads which service limited numbers of remote population, at the expense of landscape integrity and ecosystem function.

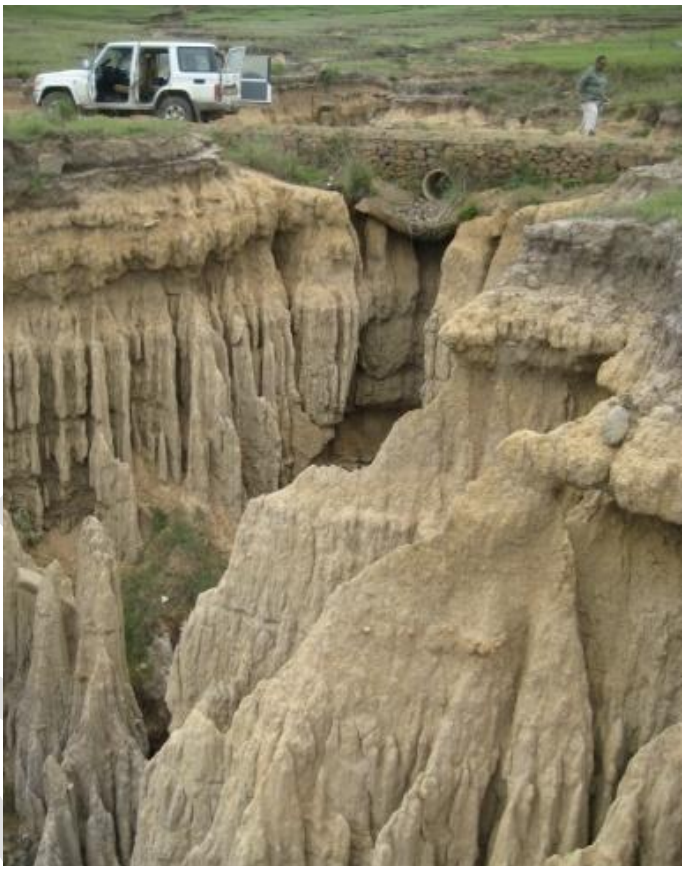


Figure25: extreme point erosion caused by culvert outlet associated with poor road drainage design, a prevalent feature in the dispersive soils of the former Transkei

☑ There is scope here for policy and demonstration level intervention with local municipality infrastructure sections, Disaster Management at District level, and Department of Roads & Transport, linking witht he NEMA EIA process and best practise design and construction approaches.

Spread of settlements

Settlement and cultivation create habitat changes which are generally not favourable for the normal range of species found in grasslands. The presence of humans and their daily activities, noise, scents and livestock is not conducive towards maintenance of high local biodiversity, but the large rangeland areas in the District do provide more favourable habitats and retreats for small range of species. Herding by naturally curious boys tends to reduce the available retreat habitats, but these people also tend to have an intimate knowledge of the indigenous species and their habits, and area rich information resource. The affinity for hunting by rural dwellers, combined with poverty and the need for many families to collect eggs and trap birds and small mammals, will reduce the local populations of certain species, and drive them into more remote areas which may not provide a suitable habitat, thereby contributing to their decline.

In general, grazing and cultivation do not appear to have a devastating impact on animal populations, but the presence of people and their activities does. As such, settlement expansion is possibly the single biggest factor affecting grassland species statusr in communal areas. Collection of crane eggs and chicks has contributed to the rapid decline of these birds across the country, whilst cultivation does not pose too much of a problem unless it destroys nests (which occur in wetlands) or uses poison-treated seed and toxic chemicals. Pressures from settlements such as the collection of grasses for building, domestic and decorative purposes does not appear to have an adverse

impact on grassland status as it occurs at a relatively sustainable household level. However, peri-urban settlement demand poses a potential threat from more commercial level harvesting. Fires destroy habitats temporarily, and over the long run will reduce the biomass in the area, subsequently reducing the availability of food for some species, such as those dependent upon grass seeds.

Deforestation and degradation
Many of the indigenous forests exist alongside commercial plantations, and threats thus include timber harvesting. Commercial operations often crush adjacent undergrowth, and destroy second generation growth of saplings. Fires from inappropriate burning regimes in rangelands are a threat along forest edges, but generally do not burn out of control in indigenous growth due to the high moisture content in such forests. The proximity of indigenous forest to plantations can increase fire threats due the high volatile content of trees such as eucalypts and pines. The most vulnerable areas include forest margins where livestock and timber harvesters can penetrate.

The management of these forests is challenging due to their geographic spread, inaccessibility and frequent use for nefarious purposes such as drug trafficking and hoarding of stolen goods. The EC Parks & Tourism Authority is in the process of adding these forests to their protected habitat responsibilities, through negotiations with DAFF, the Forestry Department. Along with their invaluable habitat role for coastal species, ECPTA is interested in exploring the restoration of the forests around Port St Johns as an important source of carbon sequestration and associated community development opportunities. Removal of alien species from the forests is already a job creation opportunity for ECPTA at Silaka Reserve.

☑ Opportunity for CSA to undertake replication of the Wildlands Conservation Trust Indigenous Trees for Life model in prioritised forest areas and mangrove areas in the lowland areas of the coast. Also, potential for CSA to support research into status of mistbelt forest habitat in central Umzimvubu area, and associated species, and its contribution to ecosystem services and climate change resilience through refuge provision and hydrological role.

4.2 Climate Change Implications

In the context climate change uncertainty and its impact on the hydrological cycle is the challenge faced by District Water Authorities in the catchment to meet an increasing water demand from a largely rural population, with growing urban and economic development demands, particularly agriculture and small industry. Towns such as Maluti, Mt Ayliff, Cedarville, Mt Frere and Port St Johns are having to increase their water supply volumes and expand their waste water treatment works, as more homes and businesses are added to the expanding urban footprint and growing sewerage network. Impact assessment research indicates that many of the catchments and sources for these supply augmentation schemes are under threat from alien infestation and degradation, resulting in high silt loads and reduced base flows, making assurance of supply risky and maintenance of infrastructure expensive.

A paper published in September 2011 in PLoS Biology journal by Matthews et al, indicates that 'ecologically poorly designed water infrastructure is likely to reduce the inherent resilience and adaptive capacity of these nations' ecosystems, permanently altering lakes, rivers, soils, and fisheries. Low levels of water security and high biodiversity threats show a close correlation globally. Climate-infrastructure
mismatches may actually make poor nations even poorer'. The paper recommends three approaches for adapting to the uncertainty of climate change impacts, including explicit integration of ecosystems into infrastructural design and development. The indications from District Municipalities in the region are that they are becoming more aware of the unpredictability of climate change, and are willing to engage in exploring ecosystems based water supply and demand management in order to ensure sustainable supply to their constituencies (pers. Comm. B. Khathali and M.Mbangata, Alfred Nzo Municipality) and align with green economy thinking, although they have a long way to go. Finance institutions are beginning to integrate compliance with environmental and catchment management requirements in their loan agreements (per.comm. J. Clark, DBSA), in the context of the looming vulnerability of water supply in the context of unpredictable climate change impacts.

The Alfred Nzo District has an annual disaster management budget of R1,7 million to address immediate needs of affected people, while the actual costs of disaster response and repair, to the tune of millions of rands annually from bridge, road and other infrastructure damage, are passed on to the relevant departments such as Roads & Transport and Housing. The Manager of the Disaster Management section at Alfred Nzo Municipality indicates huge institutional

problems in addressing his tasks, in that the function is not taken seriously by District management or politicians, and perverse and divergent policies continue to promote rather than prevent disasters.

It will also be important to develop a better understanding of the risks and opportunities associated with ecosystem based approaches to carbon sequestration, particularly in the forest and mangrove restoration and conservation in the lowland areas of the corridor over time. Currently, there are no direct current initiatives targeting climate change mitigation in the corridor. However, some work has been done on calculating carbon value of healthy versus degraded grasslands and Carbon WorX sequestration project exists near Coffee Bay. The provincial environmental authority, DEDEAT, has been fairly proactive in developing a climate change response strategy, but this appears to be mired in institutional requirements.

☑ ***This would indicate an opportunity for effective and well-received policy and awareness interventions at District, regional and national levels. A specific intervention to support the ECPTA derive benefits from climate change mitigation and adaptation funding for their expansion of forest and mangrove protection efforts should be explored as a secondary priority to the Upper Catchment for securing the ecological integrity of the Corridor.***

4.3 Other existing initiatives relevant for networking and collaboration

a. SANBI Grasslands Programme PES 4 year business plan for intervention in Upper Umzimvubu and Uthukela catchments. (Kevan, Anthea). The contributions through direct payments for environmental services are one source of funds; however funding is not limited to direct payments and payments by buyers only. Complementary initiatives, research and donor funding can potentially play a crucial role in supporting funding needs both in the short- and long term.Working for Water and UNEP, in association with BASF, have agreed to buy watershed services at the Upper Tina and Mabele site. Working for Water and the African Conservation Trust have agreed to buy services from the Upper Thukela site. The Peace Parks Foundation is currently investigating the feasibility of engaging private sector buyers for carbon and possibly water neutral trading opportunities. Within the Vuvu watershed, Working for Water has allocated R2.1 million a year. UNEP in association with BASF has offered to pay R900 000 for 2 years for ecosystem services supply from this watershed. Within the Mabele watershed, Working for Water has allocated R1.5 million a year for 3 years to pay for watershed services.
b. LIMA Community Works Programme
c. Biofuel generation …biogas, biofuel pellets, local power generation selling to grid, supplying to UK, major possibilities here. Link via Singilanga and Allan Bangay to BioTech
d. DBSA initiatives and loan agreements with Alfred Nzo District Municipality for water supply infrastructure based in environmental compliance and PES agreements (Julie Clark)
e. Save Act LEAP savings clubs for rural groups in Matatiele & Elundini-
f. Sustaining the Wild Coast (CSA?) Sandy Heather
g. ECPTA Wild Coast Project – Derek Berliner
h. EWT Drakensberg Crane Project – Tanya Smith
i. R3G network - contact Ayanda Sigwela
j. Cedarville Conservancy – 10 000 ha free range beef and sheep, with some dairy
k. Greenfields dairy and abbatoir – Kokstad area, plus Drakensberg Abbatoir in Matatiele
l. CEPF funded initiatives
    - Developing civil society capacity to improve conservation and management of Maputaland-Pondoland-Albany priority sites: Planning for an Integrated Approach
    - GIS and Data Coordination for the MPAH (Phase 1)

5. INFORMATION SOURCES RELEVANT TO POLICY AND STUDY AREA

The following documents were used as a source of information, and are also recommended for further reference during potential specific interventions, divided into possible focus sections:

Policy and general green economy:

- Botha, M. and Stanway, R. 2011: Policy Research into Agriculture, Environment and Climate Change. Gaps, synergies, conflicts and directions for Conservation South Africa. Unpublished.

- CSA, 2011: SA and the green economy. Unpublished
- DEAT, 2003: CBNRM guidelines for Community Based Natural Resource Management in SA
-

Payment for Ecosystem Services:
- Maloti Drakensberg Transfrontier Project (2007): Payment for Ecosystem Services: Developing an Ecosystem Services Trading Model for the Mnweni/Cathedral Peak and Eastern Cape Drakensberg Areas. Mander (Ed) INR Report IR281. Development Bank of Southern Africa, Department of Water Affairs and Forestry, Department of Environment Affairs and Tourism, Ezemvelo KZN Wildlife, South Africa.
- Golder & Assoc, 2010: 12505 UDP WHS buffer report v7
- SANBI 2011: 4-year Business Plan for establishing a focus area on Water and PES, prepared by Pegasys and EcoFutures.
- Add other references on database

Hydrology and Water
- CES joint venture, 2006: SEA for WMA 12 summary report, DWAF, King Williamstown
- Maluti GSM, 2011: Groundwater exploration and yield assessment for Matatiele, ANDM.
- *http://www.asgisa-ec.co.za/water.html*
- Plos Biology article on ecosystem based water infrastructure approach (see climate change)

Agricultural and soil management approaches
- Green Choice experiences from CSA
- FAO Save and Grow website: http://www.fao.org/ag/save-and-grow/index_en.html
-

General environmental and area information:
- ERS, 2010: EMP for Alfred Nzo District
- Relevant Acts and policies (incl NEMA 107 of 1998), Water Act 36 of 1996, NEMPA, Biodiversity, IMPs of nature reserves,

Coastal:
- Berliner, D. 2010: CEPF-MPAH Profile – overlap and implications for the Wild Coast Project. ECPTA

Climate change:
- Matthews, J.H., Wickel, B.A.J. and Freeman, S. 2011: Converging currents in Climate-Relevant Conservation: water, infrastructure and institutions. OPEN ACCESS: PLoS Biology, Volume 9, issue 9.
- University paper PSJ project
- Add refs on database

Mapping and GIS:
- Murray R., Baker K., Ravenscroft P., Musekiwa C. Dennis R. (2011). The delineation of favourable zones and the quantification of firm yields in Karoo Aquifer Systems for water supplies to local authorities. Draft Final Report to the Water Research Commission. Project No K5/1763.
- SANBI, 2009: BGIS website
- Berliner, D. Various GIS data sources for Pondoland and MPAH area
- Eastern Cape Biodiversity Conservation Plan Handbook, second edition 2007: DWAF
- CSIR landcover

Stakeholders and roleplayers references:
- DBSA 2010: draft catchment management minutes Oct 2010 (Julie Clarke)
- ASGISA hydro and beef and agricultural interventions

6. SITUATION SUMMARY AND POTENTIAL RESPONSE ACTIONS FOR 20 YEAR STRATEGY

6.1 Restoring Ecosystem Services to Build Resilience to Climate Change

Discussions and field visits in the Umzimvubu corridor revealed that there are key ecosystem goods and services being provided by the catchment, and in different zones of the catchment, which are under threat, and it is in response to these main threats that response actions should be considered in order to build the region's resilience to the impacts of current climatic extremes and long-term climate change. Table 5 below summarises the main services, threats and possibilities or opportunities in terms of responding to the threats in a manner which can both restore and sustain these services, while contributing towards rural livelihoods in the affected areas at the source and downstream.

UPLANDS	**Ecosystem services**	**Key Threats**	**Response Opportunities**
Goal: catchment restoration and improved management for sustained recharge and silt reduction	Water provision - quantity	Alien invasion and erosion through poor management and policies	Private sector buyer of biomass; job creation – communal PES stewardship; Communal Range management
	Water quality	Solid waste, and liquid waste treatment Agri-chemicals	Private farmers outreach; ecorangers & predator management; Recycling waste; Green drop advocacy Biogas from sewage and abbatoirs?
MIDLANDS			
Goal: water quality; reduced sedimentation and increased quantity	Water quantity and quality	Alien removal and erosion rehab	Stewardship agreement's ad settlement infrastructure planning - municipal engagement
LOWLANDS			
Goal: 1) Support forest and grassland matrix restoration and management	Carbon sequestration and DRR	Alien removal and erosion management as well as supporting carbon restoration plan for matrix (grassland/forest) Species use	Carbon partner- carbon worx; ECPTA- silake and mangroves Stewardship BRI agreements
2) Mangrove protection as carbon sink	Estuary regulation; disaster mitigation services and carbon sequestration	Mangrove restoration (used for fuel wood) Estuary sedimentation	ITFL – WCT methods

6.2 Intervention opportunities and possible timeframes for addressing threats

In order to build resilience at the landscape scale, an ambitious and focused collaborative effort is required to 1) restore the Umzimvubu River Basin ecosystems; 2) develop policies and markets that sustain best practice land and water management; and 3) develop innovative mechanisms/businesses/programmes that will link ecosystem conservation with economic development. In a series of engagements with stakeholders, it was agreed in summary that CSAs 20-year programme will build on and compliment existing initiatives in the area, providing an overarching policy context and filling the gaps with respect to planning, monitoring and exploring alternative stewardship options for restoration of communal and private land. A key goal will be to transform the motive for landcare initiatives away from the current dependency-creating *'Public Works' daily wage system* towards a *land rights holder custodian approach*, where ecosystem services maintenance costs can be recovered through user-pays valuing of these services. Such services and transactions could include water supply, sediment and in-stream disaster cost reduction, carbon sequestration, recreational / tourism value and biodiversity or species level value.
The full proceedings of these stakeholders discussions are detailed in the appended *'Stakeholder Engagement Record'.*

The Umzimvubu Corridor was divided into three zones based on key ecological factors, ecosystem services and institutional presence, as one means of planning intervention in the proposed 20 year strategic programme. These

zones are roughly defined to provide guidance for the responses during the 20 year programme, as outlined in section 1.4 earlier.

The timeframe for these responses is proposed to take the form of four key phases:

PHASE	TIMING	KEY OBJECTIVES AND ACTIVITIES
1	Years 1 – 5	**Awareness & Action learning**: focus on establishing demonstration projects in collaboration with existing initiatives, develop baselines for the area through research and M&E framework, formalise collaboration and extract lessons learnt. Establish seller side of PES structures through stewardship. Identify possible buyers / markets. Develop basic policy strategy.
2	Years 5 – 10	**Replication:** share lessons learnt into possible models/approaches, replicate or upscale projects in wider river basin geography based on models from demonstration, formalize governance processes, policy influence through advocacy based on lessons learnt.
3	Years 10-15	**Policy influence & Adoption**: supporting governance structures to adopt working models for improved catchment management, expand in wider catchment, bigger policy focus and influence
4	Years 15 -20	**Entrenchment:** measure wider ecosystem impacts from initial phases, provide ongoing support for improved governance and policy, continued monitoring and advocacy, finalise exit strategy with responsibility for communal PES management resolved

6.2.1 The Upper Catchment — top priority for Securing Sustainable Water at the Source

The first phase will focus primarily in the upper catchment zone (*Uplands*) where the source of many of the threats to these ecosystem services can be found. This zone aligns with the Matatiele Local Municipality boundary which falls within the Alfred Nzo District. The District is the mandated Water services Authority for the area, and under both the Municipal Systems Act and Water Services Act has the responsibility to provide water to its constituency. The District is located at the top of a relatively pristine catchment which is fairly intact and largely undeveloped, but which is becoming increasingly vulnerable with respect to sustaining supplies through the threat of degradation, largely alien plant encroachment and erosion.

The main response action for the first phase will focus on ***establishing appropriate restoration and stewardship models on communal land***, through demonstration pilot projects. Such response actions align strongly with the restoration focus recommendations made in the Ecosystem Services Trading Model (MDTP, 2007), which strongly link restoration with improved baseflows and reduced sedimentation. It should be noted that the URV (Unit Reference Values) for water alone in the Umzimvubu catchment is very high at 8,28, i.e not cost effective, but when combined with the benefits associated with carbon sequestration and sediment reduction, the URV is 0.48, ie. very feasible and an attractive natural capital investment option. This provides an excellent incentive for WSAs to contribute towards ecosystem services restoration in the upper catchment, whereby such investments will reduce the long term costs of water treatment and ensure sustainable supply. This can provide the basis for PES trading agreements, which will need to be augmented to sustain long term catchment health.

In addition to improved habitat and biodiversity value, the natural capital value of a restoration intervention cannot be overemphasized. It is estimated by the MDTP report that the total additional baseflow in the Upper Umzimubu after restoration would be in the region of 4 million m^3 per annum, with sediment reduction of 7.3 million tons / 5 million m^3 per year. The carbon sequestration value of an intact / restored catchment is calculated at at 337 718 tons per year. The savings with respect to reduced infrastructure damage and maintenance have not been quantified, but the District Indicates that it spends tens of millions every year on disaster mitigation. The contribution towards climate change resilience is also not quantifiable at this stage. However, for an estimated restoration cost of R9 million per year, the return on water alone is an estimated R13 million at a middle economic value and R27 million at a high economic value. Combined with the potential benefits of carbon trading and tourism, plus increased returns on livestock and agricultural activities, the cost benefit ratio is clearly outstanding.

However, design, piloting and implementation of these concepts are a challenge. CSA proposes to establish several pilot demonstration sites in the upper catchment, which will be implemented in close collaboration with local partners including ERS, DEDEAT, LIMA, Save Act, DRD&AR, Mehloding Trust and DWA. This has the advantage of building on established reputations, credibility and trust, and pooling resources for a enhanced outcomes. Three possible pilot focus areas were identified for the first phase , all located in the Alfred Nzo District and mainly in the Matatiele / Uplands zone, with a small overlap into the adjacent Umzimvubu Municipality. Consideration of pilot projects for carbon sequestration through forest protection in the Port St Johns area indicated that a focus on restoration in a manageable geographic area the upper catchment would be more feasible in terms of demonstration

return on investment and developing strong collaboration with partners and authorities in the 'water factory' end of the catchment during phase 1.

The key objectives and activities for the three year pilot phase are described in detail in the document "*CSA strategy for supporting ecosystem restoration & maintenance in the Umzimvubu catchment: phase 1".*
They can be summarised as:

a. Develop (through three active pilot demonstration sites) a replicable low cost range management approach model for communal grazing lands, which would include predator management, livestock improvement and increased returns, alien plant clearing and erosion control. This will include at least 120 000 hectares of land under improved management.
b. Collaborate with SANBI and other relevant roleplayers to broker sustainable stewardship-based PES agreements for communal areas, possibly through establishment of a Trust Fund to sustain stewardship over the long term.
c. Establish Framer Workbook monitoring system with communal and commercial farmer groups, involving at least 50 farmers, to record base line and changed scenarios related to changes in land management practise. This should result in the extension of land under some type of formal protection (conservancy or other appropriate mechanism) by at least 20 000 hectares, with measurable value increases for the improved services provided by this land.
d. Develop clear detailed baseline information on the catchment with respect to the full range of ecosystem services and goods, their status, and potential project and policy responses to be implemented over the 20 year strategy. This will include a detailed hydrological study based on available information and realistic interventions for ensuring long term water supply for the increasing population which simultaneously ensures sustained healthy services throughout the length of the catchment.

6.2.2 The Coastal Zone— a Priority Carbon and Conservation Opportunity

As a secondary priority to the Upper Catchment focus, a discrete and focused project has been designed to promote ecosystem integrity in the lower lying coastal zone of the Umzimvubu Corridor (*see Preserving Pondoland Project Proposal, CSA 2011).*

The twenty year goals of the Coastal Zone Carbon and Conservation Project are: 1) to expand and secure protection in a mosaic of threatened forest, and endemic grassland and mangrove habitats surrounding the existing Mhkambathi and Silaka Provincial Nature reserves through co-management agreements for IUCN Category 1 status; 2) to secure conservation status for significant and low-hanging forest patches in the broader Wild Coast through stewardship agreements; and 3) to generate tangible benefits for the impoverished communities living around these reserves. Specifically, over the next 20-years, CSA will work with ECPTA to deliver the following outcomes:

- Finalization of pending negotiations with communities and the Department of Foresty of to add 63,576 ha unprotected land representative of the landscape under protection in the Pondoland Centre of Endemism and 2,100 ha in the Manubi, Pagela, Mpame and Nqabarha Forests;
- Reforestation of 5 014 ha of lost forest in the Ntsubane/Port St John's Forest Estates;
- Rehabilitation of 7 025 ha of degraded forest and mangrove;
- Formalize contracts for improved farm and grazing land management on a minimum of a 10 000 ha pilot with communities within the wider buffer zone.
- Establish a **11.5** mln tC reservoir with a potential additional 1.5 mln tC to be secured over 10 years (see annex for carbon calculation).

This will be achieved by: 1) formal integration and proclamation of new community-owned protected areas (see annex 2 for more detail); 2) removing threats to the existing carbon reservoir and enhancing the sequestration capacity of the ecosystem through restoring areas of recently lost forest; 3) promoting land management practices to reduce rangeland and forest degradation major source of carbon loss and introducing measures to manage climate change induced fire hazards in the new PA and adjacent production lands; and 4) managing conservation areas and scaling up of best practice reforestation and sustainable farming for management of carbon stores and financing from emerging ecosystem markets.

A full project proposal for $7 million for a 5 year project exists and, we understand, is still under consideration by BhP Billiton. This includes a $3.5 million endowment that will support ongoing incentive carbon payments for forest conservation by community stewards. Given the value of the coastal forests and mangroves to estuary function, the opportunity to generate a demonstration of carbon sequestration service payments as a mechanism that can provide tangible economic development benefits in the Umzimvubu Corridor, and the important partnership with ECPTA, CSA will continue to fundraise opportunistically to initiate this programme.

6.2.3 Creating Economic Development that Values Nature— an Umzimvubu Small Grants Facility

A third core project within CSA's 20-year strategy is the establishment of a small grants facility that can, as SKEPPIES has in Namaqualand, create new livelihood and development opportunities that are based on the restoration and conservation of natural resources throughout the Umzimvubu Corridor. The purpose of the fund will be to incentivise and provide technical support to innovative SMME and projects that achieve both conservation and development outcomes. CSA will develop a proposal for this initiative and submit to the DBSA Development Fund in the second quarter of 2012 as part of our 5 year MOU to collaborate on such small grants funds.

6.2.4 Landscape Level Policy and Practice Co-ordination

A fourth and final core project of the CSA Umzimvubu Corridor 20-year Strategy is the coordination and landscape level engagement with municipal officials, private sector, and the wider public. The purpose of this project will be to promote awareness and embed knowledge on the important linkages between land use, land-use planning, infrastructure development, settlement locations, and impacts on the ability of the Umzimvubu ecosystems to provide food, water, climate, health, and cultural services. This project will focus fundamentally on developing human and institutional capital within the OR Tambo, Alfred Nzo and various provincial agencies to restore and sustain healthy ecosystems as a core element of the region's economic development. Key activities will be the development and implementation of a communications and capacity building strategy, facilitating discussions between upland and lowland communities/ward officials regarding water flow and quality, providing inputs into various municipal and provincial plans, policies, and programmes, and sharing lessons from all of the above with national, regional, and global structures and policy engagements.