DURBAN: STATE OF BIODIVERSITY REPORT: 2014/2015

ETHEKWINI MUNICIPALITY
ENVIRONMENTAL PLANNING & CLIMATE PROTECTION DEPARTMENT
BIODIVERSITY | CLIMATE | PEOPLE

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Biodiversity is the term used to describe the variety of life on Earth and all natural processes. This includes ecosystem, genetic and cultural diversity, and the connections between these and all species, including humans. Ecosystem services are the benefits provided by healthy biodiversity to all living things. There is growing recognition of the value of ecosystem services to human well-being in terms of health, social, cultural and economic needs. Read more about ecosystem services on pages 6 and 7 of this report.

INTRODUCTION

The intention of State of Biodiversity reporting is to present qualitative and quantitative data which describe the status of biodiversity and ecosystem services in Durban, to highlight key threats to this biodiversity and to record actions aimed at protecting and managing biodiversity. These reports are produced annually and this is the eThekwini Municipality's seventh State of Biodiversity Report. This report collates data relevant to the 2014/2015 municipal financial year[1] and also takes a closer look at the growing science of Restoration Ecology, with a specific focus on the work of one of the Environmental Planning and Climate Protection Department's (EPCPD) newest branches – the Restoration Ecology Branch.

[1] A municipal year starts on 01 July and ends on 30 June.

1 ECOSYSTEM SERVICES PROVIDED BY DURBAN'S NATURAL ENVIRONMENT

The Economics of Ecosystems and Biodiversity (TEEB) Initiative has indicated that investment in ecosystem conservation and restoration must be made in order to support key development goals such as food and water security, waste treatment as well as climate change mitigation and adaptation. These essential services upon which humans depend for basic needs are detailed below.

A Food production:
e.g. fish, crops and fruit

B Waste treatment:
e.g. removal and breakdown of excess nutrients in wetlands, detoxification of air pollution by vegetation

C Water supply:
supply, storage of water e.g. by rivers and wetlands

D Disturbance regulation:
e.g. flood control, drought recovery

E Cultural:
aesthetic, educational, spiritual and scientific use

F Recreation:
e.g. eco-tourism, sports, fishing and swimming

G Raw materials:
e.g. fuel, craftwork and building materials

H Pollination:
movement of pollen by certain species (e.g. bees) to enable plant reproduction

I Biological control:
control of pests e.g. spiders controlling mosquito populations

J Refugia:
habitat for resident or migrant populations e.g. nurseries for fish

K Nutrient cycling:
capture, storage and processing of nutrients e.g. nitrogen fixation

L Soil formation:
e.g. weathering of rock by water

M Climate regulation:
e.g. control of temperatures and wind reduction

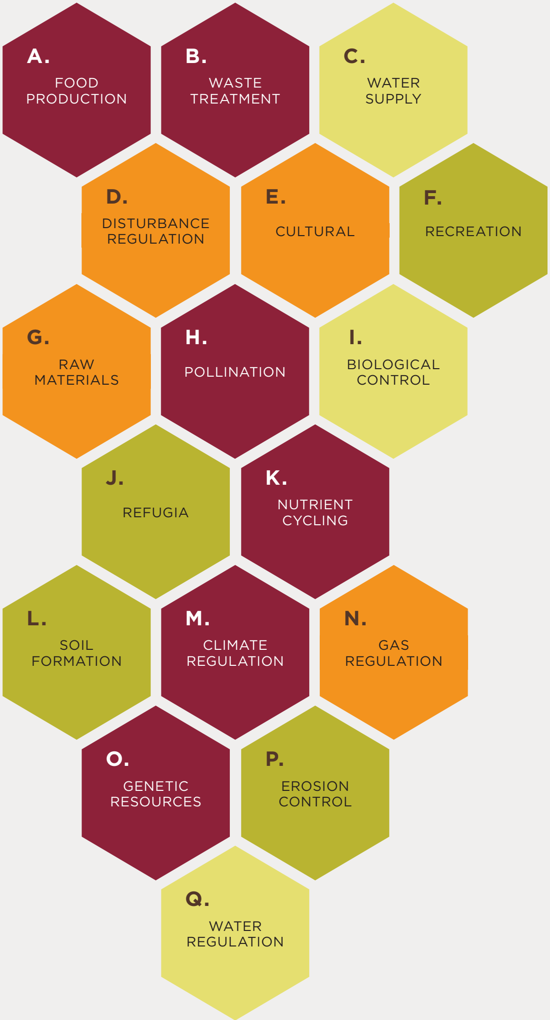
N Gas regulation:
control of the chemical composition of the atmosphere

O Genetic resources:
unique biological materials and products e.g. plant and animal medicines

P Erosion control:
storage of soil within an ecosystem e.g. wetlands

Q Water regulation:
control of water flow e.g. capture and release of water by vegetated landscapes for urban use

> "Biodiversity is life.
> Biodiversity is our life"


A.
FOOD PRODUCTION
B.
WASTE TREATMENT
C.
WATER SUPPLY
D.
DISTURBANCE REGULATION
E.
CULTURAL
F.
RECREATION
G.
RAW MATERIALS
H.
POLLINATION
I.
BIOLOGICAL CONTROL
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REFUGIA
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SOIL FORMATION
M.
CLIMATE REGULATION
N.
GAS REGULATION
O.
GENETIC RESOURCES
P.
EROSION CONTROL
Q.
WATER REGULATION

2 PROFILE OF DURBAN

TABLE 1 KEY STATISTICS
Key statistics describing Durban in 2014/2015[2]

Municipal area	2 297 km^2 (1.4 % of KZN)
Population	3.48 million
Population growth rate (2012 – 2013)	1.3 %
Percentage of people in poverty	32 %
Rate of urbanisation	82.8 %
Total exports	R 47.7 billion
Total imports	R 79.8 billion
Largest sectors	Manufacturing, tourism, finance and transport
GVA[3]	R 188.6 billion
GDP[3]	R 210.1 billion
Unemployment rate	20.6 %
Human Development Index	0.68

[2] *Denny Thaver, Global Insight/Economic Development & Investment Promotion Unit/Procurement & Infrastructure: Development Engineering, eThekwini Municipality*

[3] *Gross Value Added (GVA) is the value of all goods and services produced in an area or sector of an economy and is used in the estimation of Gross Domestic Product (GDP). The Gross Domestic Product (GDP) is the total value of all goods and services produced within the economy in a given period.*

> “ Here is the means to end the great extinction spasm. The next century will, I believe, be the era of restoration in ecology. ”
>
> *- E.O. Wilson*

THE ERA OF RESTORATION IN ECOLOGY

Can we repair some of the damage humans have done to ecosystems and biodiversity? Ecological restoration seeks to do just that.

Since the 1800s, human-induced changes to the global environment have caused a significant decline in biodiversity worldwide and driven changes in the global distribution of species – now referred to as the “Sixth Extinction.” In many instances, traditional methods of protection and management are not sufficient to ensure the continued survival of species, habitats, and ecosystems. Restoration ecology, a science that emerged as a separate field in ecology in the 1980s, looks at renewing and restoring ecosystems that have been degraded or destroyed by human activities to a stable, healthy and sustainable state. It is the practice of employing human intervention and action for conserving biodiversity and ecological integrity. Examples of ecological restoration include the active management of habitat for species e.g. burning of grasslands or removal of invasive alien species, and creation of new habitats in areas that may have been historically transformed for farming and other human activities e.g. replanting forests or recreating wetlands.

This report takes a look at some of the ecological restoration that is being done in Durban, specifically at the work of the newest branch of the Environmental Planning and Climate Protection Department – the Restoration Ecology Branch.

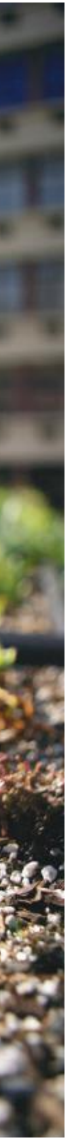
3 THE NATURAL ENVIRONMENT

South Africa is the third most biodiverse country in the world[4] and Durban contains:

- Three of the country's eight terrestrial biomes, namely, savanna, forest and grassland;
- Eight broad nationally recognised vegetation types. These are:
  - Eastern Valley Bushveld,
  - KwaZulu-Natal Coastal Belt,
  - KwaZulu-Natal Hinterland Thornveld,
  - KwaZulu-Natal Sandstone Sourveld,
  - Ngongoni Veld,
  - Scarp Forest,
  - Northern Coastal Forest and,
  - Mangrove Forest;
- Over 2 200 plant species, 520 species of birds, 37 species of amphibians, 69 species of reptiles, 80 terrestrial mammal species, and 25 invertebrate species endemic to KZN[5]
- 97 kilometres of coastline with a diversity of beach types and productive rocky shores;
- 17 river catchments and 16 estuaries;
- 4 000 kilometres of rivers; and
- An open space system of approximately 74 500 ha (approved 2010/2011), representing almost a third of Durban's total municipal area.

[4] *Conservation International - www.conservation.org*

[5] *Many species' records predate the 1990s and, as such, are not an accurate representation of current diversity. This highlights the need for more comprehensive studies of Durban's fauna and flora.*



NOVEL ECOSYSTEMS VERSUS NATIVE PURITY

Earth's ecosystems have been drastically altered by humans to the extent that this era is often referred to as the Anthropocene. Impacts on global climate systems, invasive alien species, land transformation, and the disruption of the global nitrogen cycle have increased the prevalence of ecosystems that differ significantly in composition and/or function from present and past systems. These 'novel ecosystems' are characteristic of human dominated landscapes, represented by unique plant and animal communities that have been purposely or accidently created by humans as nature accounts for human-induced changes and constantly reorganises itself. Examples include the range of various green forms—cultivated ornamental exotics, invasive alien species, hybrids and more.

Controversy exists on how and whether to manage these novel ecosystems i.e., while the conservation of indigenous species is important, is it viable, in dynamic and rapidly evolving urban areas, to insist on indigenous biodiversity above all else? Is it realistic to continue to strive to return habitats to their historic, indigenous assemblages? Or is it better to look at the functions of ecosystems—both indigenous and introduced?

On the one hand, it has been found that exotic species are often prominent in novel urban ecosystems and can underpin a range of ecosystem services. However, these same species, if they outcompete and eradicate indigenous species can negatively impact ecosystem service functioning. Some commentators believe that it would be irresponsible not to take a firm and vigilant approach to invasive species in cities whereas others believe that native purity is unattainable and unrealistic and novel ecosystems and the biodiversity therein should be appreciated for the niches they have created.

4 INDICATORS

4.1. Total area of D’MOSS

The Durban Metropolitan Open Space System (D’MOSS) is a system of green open spaces incorporating areas of high biodiversity value (private and public owned) linked together in an ecologically viable network of open spaces and is composed of a variety of habitat types (Figure 1). In 2014/2015 D’MOSS comprised ~74 500 ha of open spaces, representing one third of the eThekwini Municipal Area. The latest, still to be adopted, version of D’MOSS is a sector plan and a spatial layer, based on a systematic conservation planning approach, which identifies key areas which are selected to ensure representation and persistence of biodiversity and the supply of ecosystem services.

D’MOSS is incorporated into the city’s Integrated Development Plan, associated Strategic Development Framework, regional Spatial Development Plans and into the municipal Town Planning Schemes as a controlled development layer.

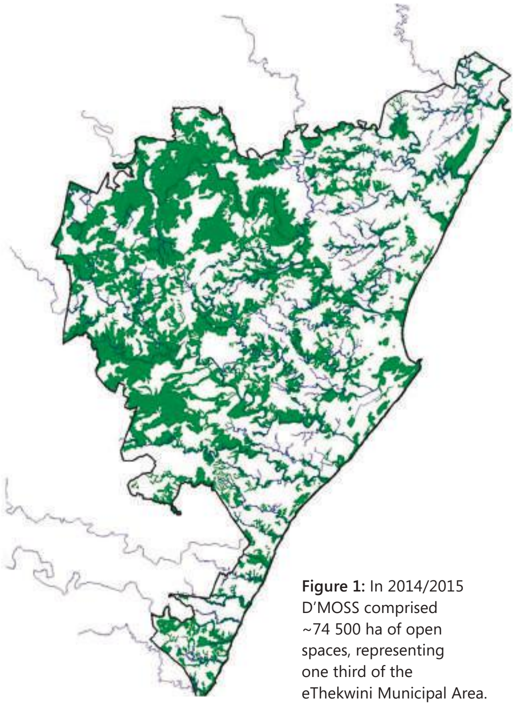


Figure 1: In 2014/2015 D’MOSS comprised ~74 500 ha of open spaces, representing one third of the eThekwini Municipal Area.

PLACE-MAKING IN PARKS

The role of green-space in creating a socially cohesive society

Increasingly, studies have shown that in addition to maintaining biodiversity and ecosystem services, green open spaces can also contribute to community and personal wellness in a variety of ways. For example, well managed green open spaces have been shown to lower crime by helping people unwind thus reducing aggression, and by bringing people together outdoors, increasing surveillance and discouraging criminals. Recent work by UN Habitat on public space has prompted the City of Durban to get involved with the development of a new Global Toolkit on Public Space and to transform policy into practice through catalytic place-making projects.

One example is the green-place development work along Mfundi Mngadi Drive in KwaMakhutha, a project spear-headed by the municipality's Parks, Recreation and Culture Department (PLCD). This arterial road running through the KwaMakhutha township contained a range of activities but lacked green open space. Instead, it was overgrown, alien infested, and was primarily used for unsightly litter disposal. After the identification of key nodes along the road that would provide the biggest 'bang for buck', several projects were initiated e.g. the conversion of a muddy dustbowl at a key intersection using minor earthworks and indigenous landscaping, removal of alien vegetation of the road verges followed by indigenous tree planting, and transformation of a vacant plot of land into a usable park. This forms part of a new and exciting approach to creating vibrant people-centered public places that have a socially cohesive purpose and aim to improve the lives of the poor and marginalised by positively transforming suburbs and old township areas that may have previously been starved of greening.

Given that public space should be at the heart of cities, the PLCD's belief is that place-making represents an exciting new development in Public Horticulture and re-valuing the meaning of greenspace in urban environments.

Original article compiled by: PLCD. Edited by: Natasha Govender (EPCPD).

4.2. Percentage of D'MOSS that is protected

In 2014/2015, only a small portion **(~10 %)** of D'MOSS enjoyed some form of protection (Table 2). This includes various categories of protection: proclaimed and unproclaimed private or public nature reserves; properties that have been purchased through the eThekwini Municipality's environmental land acquisition programme; sites where sensitive portions have been protected by non-user conservation servitudes (NUCS) during the development approval process; and sites that have been rezoned to conservation. It is the aim of the EPCPD to continue to increase the area of D'MOSS that is formally protected to ensure that Durban's biodiversity is protected into perpetuity.

TABLE 2 AREA OF D'MOSS THAT IS PROTECTED
Including categories of protection

	Hierarchical classification (ha)[6]	Totals per category (ha)
Private Conservation Area	357	398
Special Rating Area	191	215
NUCS	824	828
Private Conservation Area/Municipal Nature Reserve	118	118
Acquisition	106	546
State Owned Nature Reserve	2089	2089
Council Owned Nature Reserve	1216	1766
Conservation Zone	3	3
Environmental Conservation Reserve	964	1624
Proclaimed Nature Reserve	1146	1146
TOTAL PROTECTED	**7014**	

[6] *The hierarchical classification was defined to categorise the various levels of protection from least protected (a private conservation area that may not have legislated protection) to a formally Proclaimed Nature Reserve (protected in terms of the National Environmental Management Protected Areas Act, (Act No. 57 of 2003). The ultimate goal would be to increase the area of proclaimed nature reserves within Durban thus affording these areas the highest level of protection available in South Africa.*

4.2.1. Land Acquisition

In some restricted instances, threatened or important areas are protected through acquisition. This is achieved by either: a) purchasing the property from the owner at an agreed upon value or b) property owners donating their land to the eThekwini Municipality. In 2014/2015, **98.5 ha** of land were acquired by the Environmental Planning and Climate Protection Department (EPCPD) for environmental conservation.

4.2.2. Nature Reserve proclamation

EThekwini Municipality is currently collaborating with KZN Wildlife to proclaim ten municipal nature reserves in terms of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003). The areas to be proclaimed have varying levels of legal protection ranging from none to zoned Public Open Space, whilst there are a small number of sites 'zoned' Environmental Conservation Reserve. The formal protection afforded by the proclamation of these reserves will ensure the conservation of the sites, will allow their areas to be included in calculating national and provincial statistics for the conservation status of vegetation types and should assist with attracting more resources for the management of the protected areas. In 2014/2015, significant progress was made in the proclamation of the **210 ha** Roosfontein Nature Reserve. The "Intention to Declare" the Proclamation of Roosfontein was advertised for public comment by the MEC for Environmental Affairs and following the completion of the public process the necessary documents have been submitted for signature and gazetting. This is a huge win for conservation, not only for Durban but also for the province of KwaZulu-Natal.

4.3 Percentage of D'MOSS that is managed

Rapid urbanisation of cities increases the fragmentation of landscapes making management interventions in natural areas even more important. This management may take the form of the removal of invasive alien species, periodic burning of grassland habitats, removal of litter from streams, prevention of illegal harvesting of species etc. The management of D'MOSS in the eThekwini Municipal area is undertaken by various departments and agencies and overall, **~8.6 %** of D'MOSS was categorised as formally managed in 2014/2015.

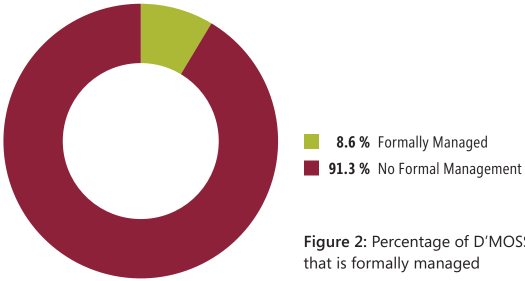


Figure 2: Percentage of D'MOSS that is formally managed

4.4 Species abundance

KWAZULU DWARF CHAMELEON

Bradypodion melanocephalum is a regionally endemic chameleon and its range is restricted to the coastal belt of KZN. The two vegetation types inhabited by this chameleon are North Coast Grassland and South Coast Grassland, both of which are classified as Critically Endangered. These vegetation types have been largely transformed by sugarcane cultivation, urbanisation and timber farming. The population of the KwaZulu Dwarf Chameleon is therefore threatened with extinction, although its IUCN Red List status has not yet been finalised.

In 2002, Ezemvelo KZN Wildlife initiated the monitoring of this species at two localities in Durban i.e. Chameleon Park and a plot of land within D'MOSS next to the Edwin Swales Business Park on Bellair Road.

Biodiversity Targets

To conserve three viable free-living sub-populations of the population of the KwaZulu Dwarf Chameleon in perpetuity the following are required:

1. At least three viable sub-populations of 7 000 adults each conserved across the range of the coastal population.
2. A viable sub-population conserved at Chameleon Park and connected D'MOSS areas.
3. A total of 100 adults conserved at Chameleon Park and the D'MOSS area adjacent to Edwin Swales Business Park.

Kwazulu Dwarf Chameleon
photo by Tyrone Ping

> "There has been a further decline in this species in 2014/2015. "

Summary

The total number of KwaZulu Dwarf Chameleons at Chameleon Park is lower than the conservation target for this species and also significantly lower that the previous year's estimate (Figure 3).

It is therefore critical that appropriate management actions at Chameleon Park are implemented if this species is to survive.

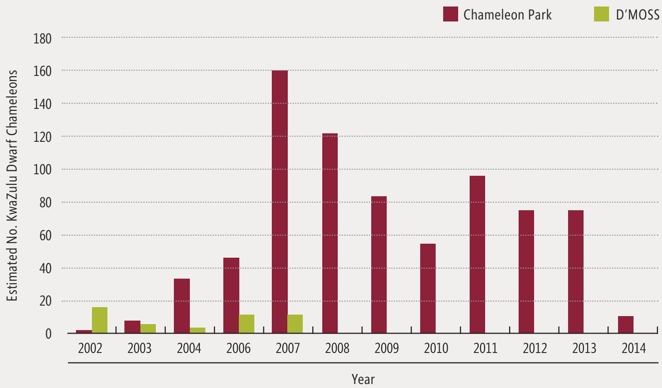


Figure 3: Estimated number of KwaZulu Dwarf Chameleons at Chameleon Park. Counts at the D'MOSS strip were suspended in 2007

Key Management Actions

A management intervention that was concluded in 2014/2015 was the rezoning of Chameleon Park from Public Open Space to Environmental Conservation Reserve (ECR). Below are some of the controls associated with this rezoning to ECR:

An ECR refers to publically owned land dedicated to the conservation and management of natural areas of land and/or water for the ecosystem services that the areas provide and the biodiversity which these areas support. Within an ECR, unless with the prior written authorisation from the Deputy Head: EPCPD:

- No earthworks, sand winning, mining, development or the erection of any structure, including but not restricted to buildings, fencing, swimming pools, wastewater and storm water infrastructure (including evapo-transpiration areas for on-site sanitation), roads, tracks, driveways, walking or cycling trails, or dams, shall be permitted,
- No landscaping or planting of any vegetation, unless it is a requirement for the rehabilitation of the environment in terms of a management plan agreed to with the municipality, shall be permitted;
- No harvesting, collecting, cutting, hunting or otherwise damaging of flora or fauna and soil and water resources, shall be permitted;
- No vehicles, motorised or non-motorised, other than on established roads, driveways or tracks, shall be permitted, and
- No pets or other domestic animals shall be permitted.

It is hoped that the controls afforded by the ECR would protect this important species and facilitate appropriate management interventions.

4.5. Threats to Biodiversity in Durban

Some of the major threats to biodiversity include:

- Transformation of natural areas (habitat destruction, degradation and fragmentation);
- Introductions of invasive alien species;
- Over-exploitation (e.g. harvesting and sandmining);
- Pollution and diseases; and
- Human-induced climate change.

Due to the lack of quantitative data relating to many of these threats, this report will only focus on transformation, invasive alien species and climate change. As more information becomes available, these will be included.

4.5.1 How much land has been transformed?

Transformed areas are those areas that have been altered dramatically from their natural state by human activities. This is one of the single greatest threats to biodiversity as it implies habitat loss, habitat degradation and fragmentation of natural areas. Transformation reduces the ability of ecosystems to deliver goods and services. In Durban, scientifically-derived conservation targets for 13 of the city's vegetation types indicate that six (highlighted in red) of these are in all likelihood beyond the natural threshold required for long-term survival (Table 3) because they have been irrevocably altered from their natural state.

Figure 6: In 2014/2015 53 % (~122685 ha) of the eThekwini Municipal Area was classified as transformed.

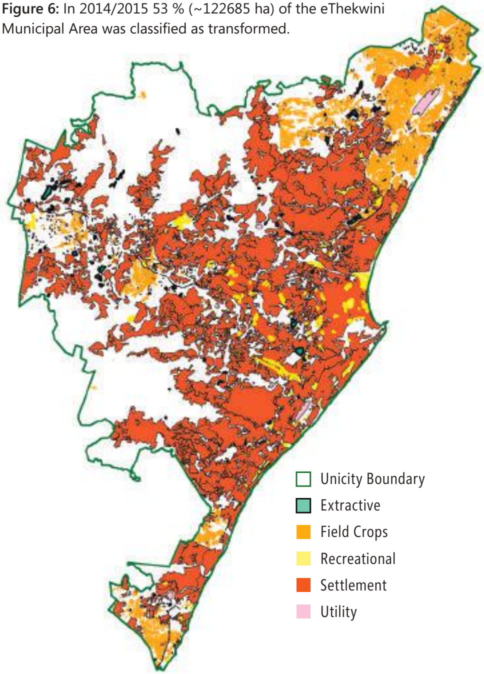


TABLE 3 VEGETATION TYPES

Targets and deficits for 13 vegetation types in Durban

Vegetation Types (Boon 2014)	Original Extent (ha)	Target (% Of Original)	Area Required To Meet Target (ha)	Area Remaining (ha)	Percentage Remaining
Coastal Forest and Grassland mosaic	20690	71.69	14833	1691	8
Dune Forest	2041	69.2	1412	585	29
Eastern Scarp Forest_above450	1432	61.61	882	2736	191
Eastern Scarp Forest_below450	2978	61.61	1835	8262	277
Eastern Valley Bushveld	59870	25	14968	26924	45
Grassland_othergeology_above450	6568	25	1642	1661	25
Grassland_othergeology_below450	46060	25	11515	912	2
KZNSS_above450	32540	25	8135	6873	21
KZNSS_below450	34070	25	8518	2933	9
Mangroves	492	100	492	73	15
Sub-tropical Dune Thicket	192.3	100	192	192	100
Sub-tropical Seashore Vegetation	16	100	16	16	100
Swamp Forest	55	100	33	55	100

Coastal Forest and Grassland mosaic (Boon 2014) = Northern Coastal Forest (Scott-Shaw & Escott 2011); Grassland_othergeology_below450 (Boon 2014) = Indian Ocean Coastal Belt Grassland (Scott-Shaw & Escott 2011); Grassland_othergeology_above450 (Boon 2014) = Ngongoni Veld and KZN Hinterland Thornveld (Scott-Shaw & Escott 2011). Vegetation types that were split based on the 450 m altitudinal break were assigned the same target, with the intention of accounting for the floristic differences across the altitudinal divide. Where percentage remaining exceeds 100 % of the original extent, the are of the vegetation type has increased. Where percentage remaining equals 100 %, it was not possible to estimate the original extent.

PALM-NUT VULTURE
to take centre stage at Bulwer Park

The Vulturine Fish Eagle, also known as the Palm-nut Vulture *(Gypohierax angolensis)*, is found in the forests and savanna areas of Sub-Saharan Africa, usually near water, and specifically, in areas where date and raffia palms can be found. It is common in north eastern parts of KZN and has been increasingly spotted in Durban flying in the vicinity of water bodies (such as the Umgeni Estuary) and in areas that contain mature Raffia palm trees. Unlike most birds of prey, the Palm-nut Vulture's primary food source is plant matter, in particular, the fleshy husks of the Raffia palm fruits, however, they are also often seen feeding on fish, crabs, amphibians and molluscs.

A large scale, public art sculpture of a Vulturine Fish Eagle will be installed in Bulwer Park, to repurpose non-compliant goods (materials that have not met the manufacturing standards) as innovative art making materials, educate the public on the dangers of non-compliant goods, and add to the public art offerings for the general public.

Funded by the Community Murals Project Trust – City Beautifications Project, the sculpture will depict a Vulturine Fish Eagle, wings spread, 'landing' on a circular concrete pedestal. The size of the sculpture will be approximately seven metres wide and five metres high.

Benefits of this project include:

- Beautification of public space by providing for artistically credible, aesthetically pleasing, interesting and informative public art
- Engaging with issues and challenges surrounding conserving biodiversity and the services it provides, specifically that of rare, vulnerable, and endangered species
- Creating a space for dialogue and debate surrounding the proliferation of non-compliant, often illegally imported contraband consumer goods
- Empowering local KZN artists, crafters and arts practitioners, and enabling income generation
- Attracting visitors to Bulwer Park, both residents and tourists

Original article compiled by: PLCD
Edited by: Natasha Govender (EPCPD)

> Unlike most birds of prey, the Palm-nut Vulture's primary food source is plant matter, in particular, the fleshy husks of the Raffia palm fruits.

POTENTIAL THREAT
Two Melastomataceae species naturalised in eThekwini

The South African National Biodiversity Institute's Invasive Species Programme (SANBI ISP) targets alien invasive species that have not yet reached their full invasive potential, i.e. populations that are relatively small/localised compared with established invaders. The benefit of this "nip-it-in-the-bud" approach is to aim for eradication and reduce the long-term management costs of invasive alien species.

Melastoma malabathricum (Indian rhododendron) and *Tibouchina urvileana* (glory bush) have both been widely used for traditional medicine and horticultural activities, but have become invasive in other parts of the world due to their adaptive life strategies. These include vegetative growth coupled with efficient seed dispersal, often aided by ants and birds.

Naturalised populations of both species have been detected in South Africa and the SANBI ISP is currently assessing the invasive risk of these species and would be grateful for reports of naturalised populations. *Melastoma malabathricum* (Indian rhododendron) is a large multi-stemmed shrub or small tree (<5 m) native to tropical and subtropical regions of South East Asia. It has naturalised in the islands of Hawai'i, O'ahu and Kaua'i and is of particular threat in wetlands. SANBI ISP are aware of one naturalised population in Kloof.

It can be identified by:

- Leaves with five indented parallel veins, and finely hairy, fig-shaped fruit which burst open to release numerous orange seeds, and large flowers comprising five lilac petals.

Tibouchina urvilleana (glory bush) is a shrub native to the rainforests of Brazil. It has naturalised in New Zealand, Hawai'i and in the Caribbean (Jamaica and Puerto Rico). In eThekwini naturalised populations exist in Westville and Hillcrest. This species can be identified by:

- Large bluish purple flowers (five petals), small fig-shaped fruits, soft and velvety leaves with five parallel veins, and square stems which are un-winged.

A closely related species, *T. granulosa* (purple glory tree) is also known to have naturalised in the Pennington area on the KZN south coast, and can be distinguished by its leathery leaves and square stems which are winged. For more information or should you see this plant, please report your sighting to invasivespecies@sanbi.org.za

Article compiled by: Reshnee Lalla and Thabiso Cele, both of SANBI.

M. malabathricum:
Large flowers comprising five lilac petals.

M. malabathricum:
Leaves with five indented parallel veins and are finely hairy.

M. malabathricum:
Fig-shaped fruit which burst open to release numerous orange seeds.

T. urvilleana:
Large, bluish purple flowers.

4.5.2 Invasive alien species (IAS)

Invasive alien species are plants, animals, pathogens and other organisms that are not indigenous to an ecosystem, and which are capable of spreading naturally (often rapidly) into natural or semi-natural habitats. They can cause economic or environmental harm or can adversely affect human health. In particular, they impact adversely upon biodiversity, causing the decline or elimination of indigenous species through competition, predation, or transmission of pathogens, and the disruption of local ecosystems and ecosystem functions.

TABLE 4 AN AUDIT OF ETHEKWINI NURSERIES

Number of NEMBA* listed species observed per nursery audit from 2005 to 2015

Park	Number Of NEMBA Listed Species Observed								
	2005	**2006**	**2007**	**2009**	**2011**	**2012**	**2013**	**2014**	**2015**
Botanic Gardens A (cultivation/storage)	-	-	-	15	11	19	5	**3**	**7**
Botanic Gardens B (production/display)	8	10	9	13	11	13	3	**5**	**3**
Botanic Gardens C (sales)	3	6	6	1	5	7	7	**9**	**7**
Bridgevale Nursery (production/display)	18	26	21	23	22	29	22	**19**	**17**
Randles Nursery A (production/display)	29	26	-	-	6	7	9	**4**	**4**
Randles Nursery B (decorative)	-	-	-	-	-	10	5	**2**	**2**
Farewell Nursery (cultivation/storage)	13	25	21	27	23	25	12	**9**	**9**
Hillary Nursery (production/display)	14	29	29	33	32	32	27	**17**	**19**
Amanzimtoti Nursery (cultivation/storage)	16	26	30	26	22	28	11	**5**	**13**
Silverglen Medicinal Plant Nursery (cultivation/storage)	4	20	14	20	9	21	19	**8**	**9**
Buffesldraai Storage Nursery A (EPCPD reforestation programme)	-	-	-	-	12	18	18	**12**	**12**
Buffesldraai Storage Nursery B (EPCPD reforestation programme)	-	-	-	-	-	-	-	**8(new)**	**10**

Invasive Alien Plant Removal at Rainbow Drive grassland, Crestview

A two hectare portion of KZN Natal Sandstone Sourveld grassland located between Rainbow Drive and Parkview Drive in Crestview was purchased through the eThekwini Municipality's environmental land acquisition programme in 2014. This vegetation type is home to a rich and diverse range of grassland species but is under major threat from development. Thirty percent of this particular acquired grassland site was infested with invasive alien plants, predominantly *Plectranthus comosus, Duranta erecta, Canna indica, Rubus cuneifolius, Tecoma stans, Melia azedarach, Pinus sp, Acacia mearnsii, Schinus terebinthifolius, Chromolaena odorata, Solanum mauritianum, Hedychium* sp., *Cinnamomum camphora, Morus alba, Tithonia oliversifolia* and *Senna didymobotrya*. Invasive alien management was conducted on the site through the Outer West Parks Alien Eradication Programme.

TABLE 5 AN AUDIT OF ETHEKWINI PARKS

Number of NEMBA* listed species observed per park audit from 2008 to 2015

Nursery	Number Of NEMBA Listed Species Observed				
	2008	2010	2013	2014	2015
Memorial Park	11	9	9	**8**	**13**
Town Park	12	15	8	**7**	**3**
Japanese Gardens (Sarnia)	20	25	26	**16**	**12**
Japanese Gardens (DBN North)	34	39	38	**36**	**29**
Sunningdale Ponds	19	17	23	**23**	**20**
Phoenix Plaza	5	14	14	**10**	**11**
How Long Park	10	16	19	**13**	**11**
Amanzimtoti Bird Park	17	25	21	**16**	**15**
Havenside Park	19	23	22	**21**	**18**
Gugu Dlamini Park	3	1	2	**2**	**2**

**NEMBA: National Environmental Management: Biodiversity Act (2004)*

DURBAN INVASIVES WEBSITE

One of the most effective ways to reduce the proliferation of invasive alien species is to detect and control their infestations, before they become too widespread. To do this, the Environmental Planning and Climate Protection Department (EPCPD) of eThekwini Municipality initiated the Early Detection and Rapid Response (EDRR) Project. This led to the launch of the Durban Invasives website **(www.durbaninvasives.org.za)** in 2013, which allowed for the reporting of selected invasive alien plant (IAP) species, as are featured on the website's target list. Partner organisations operating within eThekwini Municipality use data from the website to guide simultaneous targeted IAP control efforts. The website is now a successful platform for sharing field observation data and updating the status of different target species, for control and research purposes. Website visitors are able to access information on IAPs listed on the website, but have to register as 'spotters' should they wish to report a sighting.

Currently, the website has 87 registered spotters and 25 target species. The website is growing in popularity, with both a 22 % increase in web sessions from last year, and a 52 % increase in the amount of time people spend on the site. User login is up 144 % indicating new spotter registrations, and sighting reports have increased by 500 % since last year. The five species most reported are: *Parthenium hysterophorus, Campuloclinium macrocephalum, Triplaris americana, Furcraea foetida* and *Lilium formosanum*. According to statistics captured from the website developer, the website is accessed from a range of devices (desktop, mobile, tablet), but laptops remain the most popular.

4.5.3 Climate change

In Durban, the following changes have been projected to occur:

- Increases in temperature of 1.5-2.5 °C by 2045-2065 and 3-5 °C by 2081-2100. Rainfall in Durban is projected to increase in the future (up to an additional 500 mm by 2081-2100). The distribution and variability of this rainfall will change; with rainfall events becoming more erratic.
- The sea level along the Durban coastline is rising at present by 2.7 cm every decade. Projections indicate that this rate is likely to accelerate in the future.
- Due to these changes in temperature and rainfall, the bio-climatic envelopes (distributions of plants and animals based on climatic variables) in which the fauna and flora of Durban exist could shift. This places additional pressure on Durban's biodiversity.

4.6. Responses to threats

4.6.1. Greenhouse Gas inventory

A Greenhouse Gas (GHG) Emissions Inventory for the eThekwini Municipality has been compiled for the 2013 calendar year and was made available in the 2014/2015 municipal financial year. The inventory identifies the sources of GHG emissions from both the government and community sectors within the eThekwini Municipal Area. The eThekwini Municipality has compiled the Emissions Inventory to help plan climate change mitigation strategies within the Municipality.

The total greenhouse emissions recorded for entire eThekwini Municipal Area was **28, 741, 558 tCO²e** for 2013 (Figure 5), a slight decrease in emissions compared to 2012. The largest contribution to this footprint was transportation (38 % of the total GHGs) followed closely by Industry emissions (32 %). Local government emissions accounted for 5 % of the total emissions for the eThekwini Municipal Area.

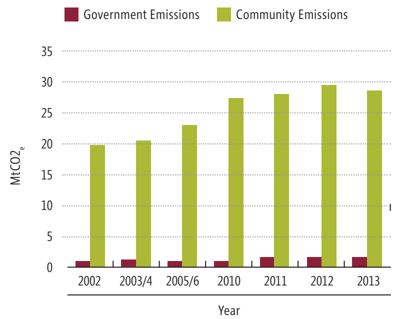


Figure 5: Emissions data for the eThekwini Municipality (tCO2e) from 2002 to 2013

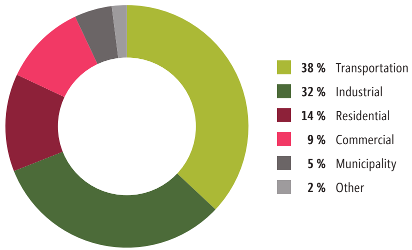


Figure 6: Carbon emissions by sector

WORKING ON FIRE goes from strength to strength

Working on Fire (WoF) is a sustainable development programme which aims to alleviate poverty and develop skills by employing people to manage aspects of the environment with a strong education and training component.

The WoF programme applies fire, during the dry season, as a tool to manage grasslands and to control invasive alien plants (IAPs). In addition, WoF also includes the control of IAPs on high priority biodiversity sites through manual, chemical and/or mechanical clearing. The 2014/2015 year was a successful year for WoF, with targets met in all areas. A total of 39 296 m of tracer belts were applied to prevent arson fires from burning properties. A dedicated Early Detection & Rapid Response team (EDRR) dealt with the emerging weed - *Lilium formosanum* or Formosa Lily - in several areas in the eThekwini Municipality. One major challenge experienced during this financial year was the Working on Fire contract coming to an end during the middle of the dry/burning season. This created a high risk situation for the eThekwini Municipality due to the potential for several high fire-risk properties being exposed to arson fires.

A further success was achieved in the ongoing research on the control of Bracken fern (an indigenous fern which has been removed from the list of protected ferns as it encroaches into, and transforms grasslands). Trials were conducted on various sites (Nkuthu Valley; Giba Gorge; Springside; Edgecliff & High Meadow) and research findings revealed that Bracken fern can best be controlled by hand-pulling at 8-week intervals.

4.6.2. Restoration Ecology

The Restoration Ecology Branch of EPCPD was established in 2011 in response to the realisation that restoration of urban open space ecosystems was fast becoming a priority in cities across the globe. Of particular concern were the observed negative impacts of climate change, habitat fragmentation, nutrient enrichment and ecosystem transformation by invasive species. It became clear that cities would need to learn to recognise, understand and then develop management plans for a suit of novel ecosystems, while at the same time conserving existing biodiversity present within the relevant established vegetation types. It was recognised that innovative approaches would be required to ensure that natural corridors and open spaces remain optimally functional and are able to deliver important environmental services to a growing population.

An approach was adopted that allowed for training and development of local people and small businesses, to implement the required management interventions. This included the control of invasive alien plant species, planting of indigenous vegetation, as well as fire control in grassland areas. This approach has allowed eThekwini Municipality to deliver on job creation and skills development imperatives, while simultaneously ensuring maintenance of healthy ecosystems. Three large-scale programmes, namely the Working for Ecosystems, Working on Fire, and Community Reforestation Programmes were established. These are now integral to the work undertaken by the Restoration Ecology Branch.

The ground-breaking and transformative approaches adopted have demonstrated how the Municipality can protect biodiversity, adapt to climate change, and optimise sustainable green job creation. As a means to test and reflect on these methods, ongoing research associated with the range of projects is underway (read more on Page 32). It is anticipated that this research will allow the Restoration Ecology branch to achieve a foresighting function that ensures optimal ecosystem management regardless of future challenges. This will be achieved through: 1) developing and implementing policies, plans & projects, for biodiversity & climate protection, 2) ensuring optimal and appropriate environmental asset management, 3) undertaking research to improve ecosystem restoration and sustainability, and 4) optimising co-benefits relating to skills development and job creation.

In the 2014/2015 municipal financial year, the Restoration Ecology Branch of the EPCPD had a budget of **R 15 467 262.00** allocated to invasive alien plant control and a further **R 17 657 674.00** for reforestation. The management of natural areas allows for a unique opportunity to address one of the biggest threats to biodiversity i.e. poverty.

TABLE 6 ALIEN PLANT CONTROL

Breakdown of EPCPD Invasive alien plant control for the 2014/2015 municipal financial year

Programme	Working On Fire	Working For Ecosystems
Total area of IAP control	1 991.9 ha	2 952.8 ha
- Initial	1 070.7 ha	121.3 ha
- Follow-up	442.4 ha	2 831.5 ha
- Maintenance	478.8 ha	n/a
- Burning	266.7 ha	n/a
Training Courses	15	68
Training Person Days	270	1 064
Total Jobs Created	60 (36 % women)	307 (65 % youth, 30 % women)
Total Person Days	26 560	24 946
Budget	**R 7 783 804.00**	**R 7 754 968.32**

The information presented on pages 28–35 has been compiled by the Restoration Ecology Branch of the EPCPD.

WORKING FOR ECOSYSTEMS

The key objective of the WfE programme is the control of invasive alien plants (IAPs) in key catchment areas, through the involvement and employment of local community members. Implementation of the WfE programme is on-going and although there were some minor challenges in 2014/2015, success was achieved throughout the year. Below are some of the highlights of the year.

- The WfE programme has a strong focus on SMME development and a total of 14 fully black-owned small businesses were supported and received continuous mentoring.
- Research within the WfE programme progressed very well on three fronts, namely: 1) value-added industries such as the production of biochar, 2) remote sensing of invasive alien species and 3) sustainable learning pathways linked to the Expanded Public Works Programmes and other job creation opportunities in order to strengthen the development of green jobs.
- The programme established and maintained important partnerships with other stakeholders, i.e. Working for Water, DUCT, SANBI, SANParks etc., who are also involved in IAP clearing.
- Of notable interest, was a community from Stockville in Ward 10 that made a request to WfE to assist in IAP clearing in their area. Although this came as an ad-hoc request, the programme was able to extend its services into Stockville and the site will be managed on a continuous basis.
- The WFE programme also responded to a site management request at Treasure Beach where there was a need to control indigenous and alien invasive species that were encroaching on the Treasure Beach grassland.

There are currently 14 SMME's developed and contracted to Working for Ecosystems, demonstrating how biodiversity conservation and management can contribute positively to socio-economic upliftment.

4.6.3. Reforestation

The EPCPD has partnered with the Wildlands Conservation Trust in order to restore selected indigenous forest areas in the EMA. The reforestation programme has adopted the Community Ecosystem-Based Adaptation (CEBA) model, which demonstrates the strong and vital link between socio-economic upliftment and biodiversity conservation, enhanced ecosystem functioning and carbon sequestration. 'Treepreneurs' propagate trees at their homesteads, through the Indigenous Trees for Life Programme developed by Wildlands Conservation Trust. Treepreneurs then trade their trees for basic food items, clothes, building materials and even school fees. 90 % of people who now benefit from this project were earning wages below the poverty line, and are therefore some of the most vulnerable communities in the country. Many of these Treepreneurs are women and children, unemployed adults, and pensioners.

TABLE 7 REFORESTATION

Reforestation projects for the 2014/2015 municipal financial year

Combined Statistics for Buffelsdraai and iNanda Mountain	
Total Permanent Jobs	94
Total Temporary Jobs	61
Total Part-Time Jobs	4
Active Treepreneurs	674
Area Planted	**137 ha**
Trees Planted	**138 378**
Budget	**R 11.4 million**

CREATING ENVIRONMENTAL CHAMPIONS

One of the many inspirational stories that have emerged since the inception of the reforestation programme is that of Melta Majola, a treepreneur for the Buffelsdraai Community Reforestation Project. Melta has been working on the project since 2009. She lives with her two grandchildren, caring for them following the death of her son and daughter-in-law. Through this project she has learnt to collect seed from the wild on her own, growing seedlings for the reforestation project. The sales of these trees complements the money she receives from her pension grant and she has been able to better support her family in this manner. Through the project she has been able to buy an electric stove, making her home safer, and she is also able to buy groceries from the trees sales. This frees up her pension grant which she then uses for school fees and transport for her grandchildren. During a recent visit, Melta's home tree nursery had a stock of approximately 1 200 ready-for-sales trees which were valued at ~R 7 000. Melta has indicated that she appreciates the knowledge of indigenous plants that she has gained through this programme. Melta is also involved in recycling and grows her own vegetables - a true Greenpreneur.

4.6.3.1. Community Reforestation Research Programme

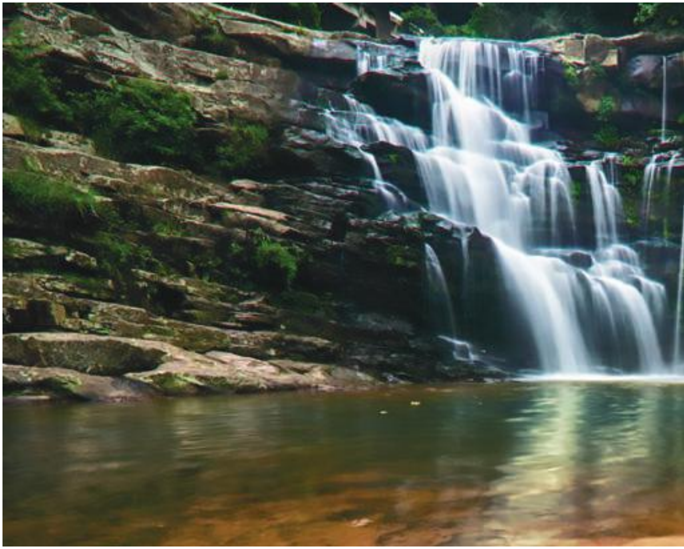
The Community Reforestation Research Programme is a joint initiative between the eThekwini Municipality (EM) and the University of KwaZulu-Natal (UKZN) under the Durban Research Action Partnership (D'RAP). The partnership was developed to advance knowledge in biodiversity conservation and management within the context of global environmental change. The programme not only aims to generate much-needed knowledge to assist managers in the Municipality in making biodiversity and conservation decisions, but also to build capacity by employing interns and supporting student research activities at the university. Such novel institutional partnerships are important for generating knowledge and learning so as to address the gap between scientific research, policy development and management within a local government setting.

The programme is facilitated by the eThekwini Municipality, in particular the Environmental Planning and Climate Protection Department (EPCPD), the Research Chair in Land Use Planning and Management at UKZN, along with researchers from various other disciplines at UKZN. The research programme focuses on all sites where community reforestation is taking place (Buffelsdraai, Inanda and Paradise Valley). This complex research programme uses the principles of transdisciplinary research. In essence, this involves identifying and framing a common research problem, integrating knowledge from various disciplines and developing products for decision-making and science.

Since the inception of the programme in July 2014, there are a total of 12 students enrolled in the reforestation research partnership, including 10 MSc's and 2 PhD students who are fulfilling the key research areas. These include researching the socio-ecological benefits of the activities within the project, using a research-based approach for developing a long-term monitoring programme and assessing the impacts of climate change on the project.

Some of the research topics include:

- Quantifying ecological restoration success
- The role of naturally functioning ecosystems in improving in-stream water quality in urban areas
- Examination of community engagement and responsiveness to conservation practices: A case study of Buffelsdraai site
- Testing the utility of DNA barcoding in South African Hemiptera: Using eThekwini as a case study
- Assessing Greenhouse Gas Emissions and Soil Carbon Sequestration in Buffelsdraai reforestation sites and Wetlands
- Using remote sensing to monitor the change in surface air temperature over different vegetation growths at Buffelsdraai
- A cost-benefit analysis of the eThekwini Municipality Community Reforestation Programme and the impact of the programme on rural household welfare
- Assessing Greenhouse Gas Emissions and Soil Carbon Sequestration in Buffelsdraai reforestation sites and wetlands



RESEARCH SPOTLIGHT
Quantifying the benefits of ecological restoration

Lutendo Mugwedi is a PhD candidate at the University of KwaZulu-Natal, Pietermaritzburg. He is investigating the potential of ecosystem restoration to enhance biodiversity conservation and ecosystem services provision, thus increasing climate change mitigation and adaptation within the eThekwini Municipal area. The aims of his study are as follows:

1) To identify degraded sites that can be prioritised for restoration to improve biodiversity conservation and ecosystem services provision. This section will use a spatial conservation planning framework - Zonation software,

2) To identify the optimal allocation of restoration resources to different restoration actions under different environments to improve biodiversity conservation, ecosystem services provision and employment. This section will use a conservation planning framework - RobOff software, and

3) To assess the restoration success of the Buffelsdraai Landfill Site Community Reforestation Project. This will be achieved by assessing three ecological attributes, viz. vegetation structure, species diversity and ecological processes under differently aged restoration plantings.

Lutendo will continue to look into ecological aspects within the Reforestation Programme focusing on the other reforestation sites (Paradise Valley and iNanda Mountain).

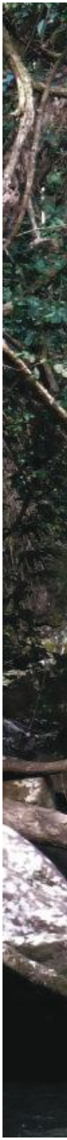
Lutendo Mugwedi

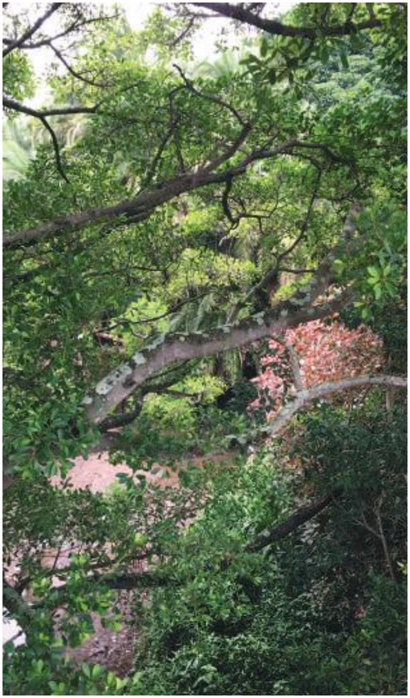
RESEARCH SPOTLIGHT: Kholosa Magudu

The role of naturally functioning ecosystems in improving in-stream water quality in urban areas

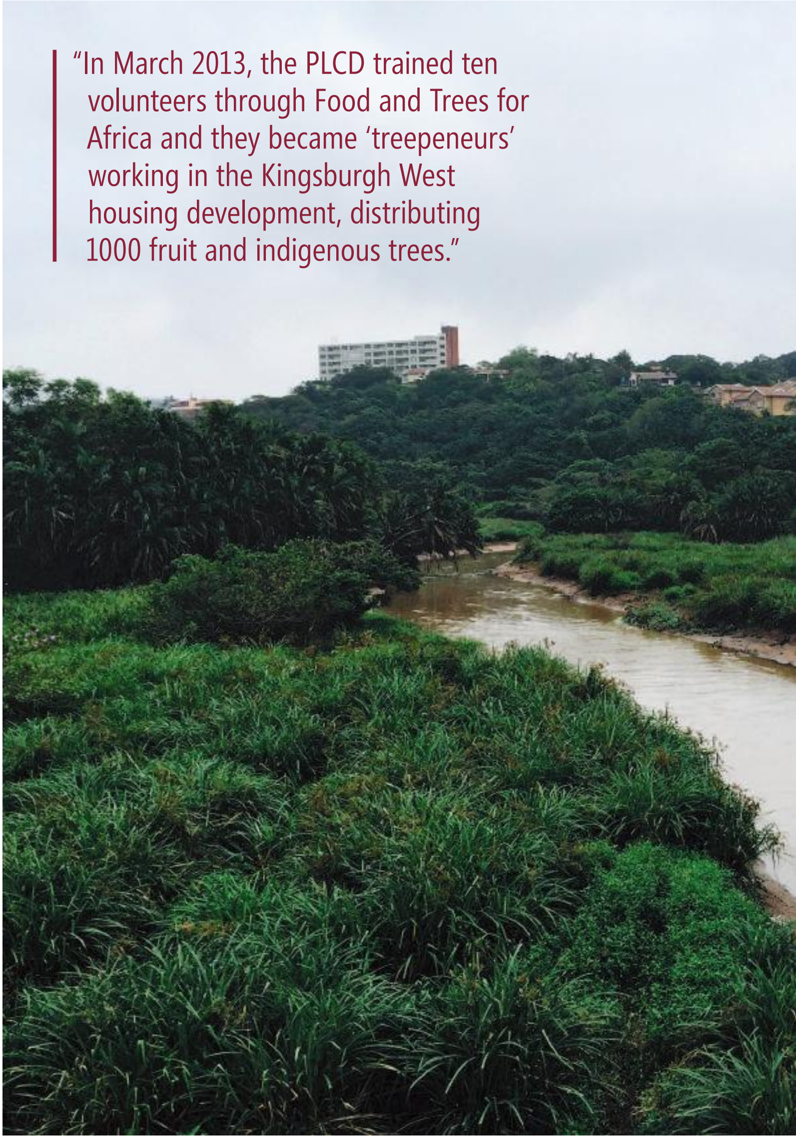
Kholosa Magudu is currently undertaking her MSc research at the University of KwaZulu-Natal, Pietermaritzburg. Her project explores the effect of restoring riparian habitats across three study sites: Buffelsdraai, Paradise Valley and Krantzkloof Nature Reserve (Molweni River) which is a reference site in this study. Kholosa utilises water quality tools such as mini SASS, diatoms, and water clarity to test the water quality in rivers. Her project aims to: a) measure the effect of land-use/ reforestation on the ability of a river system to restore itself, b) monitor the biological water quality using mini SASS and diatom-based indices, and c) assess the condition of the river system using the Index of Habitat Integrity. Her results have demonstrated an improvement of water quality at sampling sites situated below a recently restored habitat. She will require further sampling in order to assess the changes in water quality across a gradient of land use intensity.


Kholosa Magudu





"In March 2013, the PLCD trained ten volunteers through Food and Trees for Africa and they became 'treepeneurs' working in the Kingsburgh West housing development, distributing 1000 fruit and indigenous trees."



CYENZA GROUP
Volunteer park development

In 2012, the eThekwini Municipality was approached by members of the public to initiate an alien clearing project along a stream that feeds into the Little Amanzimtoti River in the iLovu area. These individuals were encouraged to join the DSW Adopt A Spot programme and became a recognised group of volunteers. The Parks, Recreation and Culture Department (PLCD) was approached with a request for assistance with the project, resulting in a partnership being formed. The PLCD provided basic training on invasive alien plants and methods of control. Following this, extremely dense Category 1 infested areas along the Little Amanzimtoti was cleared.

In March 2013, the PLCD trained ten members through Food and Trees for Africa to become 'treepeneurs' working in the Kingsburgh West housing development, distributing 1 000 fruit and indigenous trees. The new housing development was constructed on former sugar cane fields and lacked indigenous flora.

The Cyenza group are passionate and proactive individuals and in 2015 were engaged by the Department of Public Works as part of their Expanded Public Works Programme for a period of 12 months. This engagement provided the group with some funding and they were sponsored a container as a base from which to work. Their recent successes include clearing 0.5 ha of a 2 ha site of invasive alien species and distributing a further 100 trees to 50 newly built houses in the Kingsburgh West RDP housing development. The PLCD will be using funds won at the Arbor City awards to further develop the park to be enjoyed by the community growing adjacent to it.

TABLE 8 TREE PLANTING

Tree planting by eThekwini Parks, Leisure and Culture Department

AREA / LOCATION	NO. OF TREES PLANTED			SPECIES
	INDIGENOUS	EXOTIC	FRUITS	
Hambanathi Entrance	52		6	*Harpehyllum, Antidesma, Protornus*
Sommerset	20			*Syzygium cordatam, Harpephyllum caffrum, Mimosups caffra*
Buffelsdale Entrance	15			*Harpehyllum caffrum*
Mt Edgecombe	10			*Millettia grandis, Halleria elliptica*
Cnr Genazzano & Ushukela	54			*Ficus natalensis, Erythrina caffra*
Saratoga Park	6			*Antidesma venosum*
Verulam-Cornubia Daylee	10			*Erythrina caffra*
King Bhekuzulu Road	30			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Emachobeni Main Road	40			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Sipho Siwela Road	90			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Campells Town Playlot	15			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Stonebridge Drive	20			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Longberry Playlot	10			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Hexham Playlot	8			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Toledo Park Playlot	5			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Westham Playlot	7			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
JG Champion Road	5			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Unifern open space	8			*Trichilia dregeana, Millettia grandis, Syzygium cordatum*
Ntuzuma F - Umbalane Road	20			*Erythrina caffra, Harpehyllum caffrum, Celtis africana*
Ntuzuma A - Mpangele Road	10			*Erythrina caffrum*
	13			*Harpehyllum caffrum*

AREA / LOCATION	NO. OF TREES PLANTED			SPECIES
	INDIGENOUS	EXOTIC	FRUITS	
Newlands East Drive	150			*Herpephyllum caffrum*
New West Secondary	30			*Heteropyxis natalensis*
Hillcrest Bowling Club	35			*Ficus natalensis, Trchelia dregeana, Rauvolfia, Caffira, Bridelia micrantha*
Hammarsdale Police Station	2			*Heteropyxis Nalansis*
	1			*Sysgium Cordatum*
Hillcrest Police Station	2			*Terminalia phaneoplebia*
Mophela Cemetery-Sankontshe	17			*Combretum erythrophyllum, Antidesma venosum, Terminalia phaneoplebia, Mimusops obovata, Kigelia africana*
Cnr Pioneer and Old Main Roads, Kloof	48			*Trichilia dregeana, Bridelia micrantha, Protorhus longifolis Calodendrum capense, Erythrina lysistemon, Carissa macrocarpa, Aloe arborescens*
Cliffdale Christian Centre	3			*Indigofera jucunda, Trichilia dregeana, Celtis africana, Terminalia phanerophlebia, Ficus lutea, Combretum erythrophyllum, Halleria lucida*
7 Umbulane Road, Everton	2			*Protorhus longifolia*
Trees planted on verge	4			*Trichilia dregeana, Terminalia phanerophlebia, Combretum erythrophyllum, Celtus africana*
Rainbow Park new housing development	16			*Citrus, Papaya, Avo (Persea) Mangifera, Cussonia spp, Deinbollia oblongifolia, Olea europaea, Heteropyxis natalensis, Calpurnia aurea*
R603 to Cyenza Park	36			*Harpehyllum caffrum, Erythrina caffra / lysistemon, Chionanthus peglerae, Olea africana*
Cnr R603 - Rainbow New Park	25			*Erythrina lysistemon, Acacia robusta, Deinbollia oblongifolia, Acacia xanthophloea, Cussonia sphaerocephala, Aloe barberae, Trichilia dregeana*
Cnr Long Acres and King Bhekuzulu	8			*Erythrina lysistemon, Trichilia dregeana, Antidesma venosum, Ficus natalensis, Protorhus longifolia*
Lewis Drive, Amanzimtoti	15			*Combretum kraussii*
Lovu C Street 510223				*Erythrina lysistemon*
Amanzimtoti Circus Site	15			*Syzygium cordatum, Rauvolfia caffra, Trichelia dregeana, Harpehyllum caffrum, Ekebergia capensis, Croton gratissimus, Heteropyxis natalensis*

AREA / LOCATION	NO. OF TREES PLANTED			SPECIES
	INDIGENOUS	EXOTIC	FRUITS	
Lovu C - Rainbow Park	25			*Acacia xanthophloea, Acacia robusta, Cussonia sphaerocephala, Harpehyllum caffrum, Aloe barbarae, Erythrina caffra*
Kingsburgh West - Long Acres	40			*Ficus lutea, Combretum kraussii, Erythrina caffra / lysistemon*
Adams Pavilion	200			*Ficus natalensis, Acacia robusta, Ficus lutea, Warburgia salutaris, Celtis africana, Chionanthus peglerae, Margaritaria discoidea, Calodendrum capense, Olea europaea* subsp. *africana, Harpehyllum caffrum, Croton sylvaticus, Rauvolfia caffra, Commiphora harveyi*
Beach Rd, Amanzimtoti Beach	16			*Mimusops caffra, Sideroxylon inerme*
Hutchison Park behind Tennis Courts	20			*Podocarpus latifolius, Oxyanthus pyriformis, Garcinia gerrardii, Halleria lucida, Bersama lucens, Cryptocarya woodii*
Mfundi Mngadi Rd, KwaMakhutha	55		25	*Cussonia spicata, Chionanthus peglerae, Celtis africana, TrichIlia dregeana, Milletia grandis, Erythrina caffra, Erythrina lysistemaon, Acacia xanthaphloea, Aloe barberae, Olea europaea* subsp. *africana, Ficus lutea, Citrus, Papaya*
Amanzimtoti Beach picnic site	8			*Mimusops caffra, Allophylus natalensis,*
Road 8, Ezimbokodweni	5			*Erythrina lysistemon*
Prince Mcwayizeni Road (350), Mangosuthu Highway (400), Avenue East (15), Ocean Terrace (35), Outer Circuit (13) and Dakota facilities (11)	824			Various
Chesterville - Lafarge Ridgeview Quarry	40			Various
In and Around District 8: Bayview, Shallcross Rd, Woodhurst Park, Kharwastan, Mobeni Heights, Bellair, Havenside, Burlington Heights, Lamontville High, High Terrace, Croftdene Drive	840			Various
Milky way	35			*Ficus natalensis, Trichilia dregeana, Rauvolfia caffra, Bridelia micrantha*
Kwandengezi CBD	3			*Trichilia dregeana*
Grass hopper Park	3			*Erythrina lysistemon*
Kwandengezi CBD	20			*Aloe arborescens*
Klaarwater CBD	35			*Ficus natalensis, Trichilia dregeana, Rauvolfia caffra, Bridelia micrantha*

AREA / LOCATION	NO. OF TREES PLANTED			SPECIES
	INDIGENOUS	EXOTIC	FRUITS	
Klaarwater Depot	6			*Trichilia dregeana*
St Wendolins Sport Field	4			*Erythrina lysistemon*
Umbhedula Sports Field	20			*Aloe arborescens*
Milky Way, Marian Ridge	165			*Erythrina caffra*
Mountbatten Drive	77			*Harpephyllum caffrum, Erythrina lysistemon*
Whittaker Avenue	27			*Erythrina lysistemon*
Winchester	20			*Erythrina lysistemon*
Gladys Manzi, Albert Park, Victoria Park, Shepstone Road, Morningside	67	9		*Terminalia phanerophlebia, Trichilia drageana, Erythrina caffra*
Verges: Special service: TAFTA: Amaoti, John Dunn House, St Martins, Outspan, Tafta Park, Robert Storm House, Tafta on Ridge, Tafta Lodge, Ocean View, Lucas Gardens	10			*Vepris lanceolata*
Botanic Gardens: Lake Extension	10		39	*Chionanthus peglerae, Margaritaria discoidea, Syzygium guineense, Calodendrum capense, Harpephyllum caffrum, Citrus bearss* (lime), *Citrus reticulate* (mandaline), *Citrus reticulate* (sotsuma), *Dovyalis caffra* (kei apple), *Litchi chinensis, Persea americana, Leonotis leonurus, Dombeya cymosa* (smooth wild pear), *Inhambanella henriquessii, Harpephyllum caffrum, Macadamia ternifolia, Strychnos minor, Musa ocuminata, Citrus sinensis* (naval orange), *Citrus sinensis* (valencio), *Mangifera indica* (mango), *Moringa oleifera* (moringa), *Passiflora quadranguralis* (granadilla)
TOTALS	**3445**	**9**	**110**	

This is the eThekwini Municipality's seventh State of Biodiversity report. The next report will be for the 2015/2016 municipal financial year and will be produced in December 2016.

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