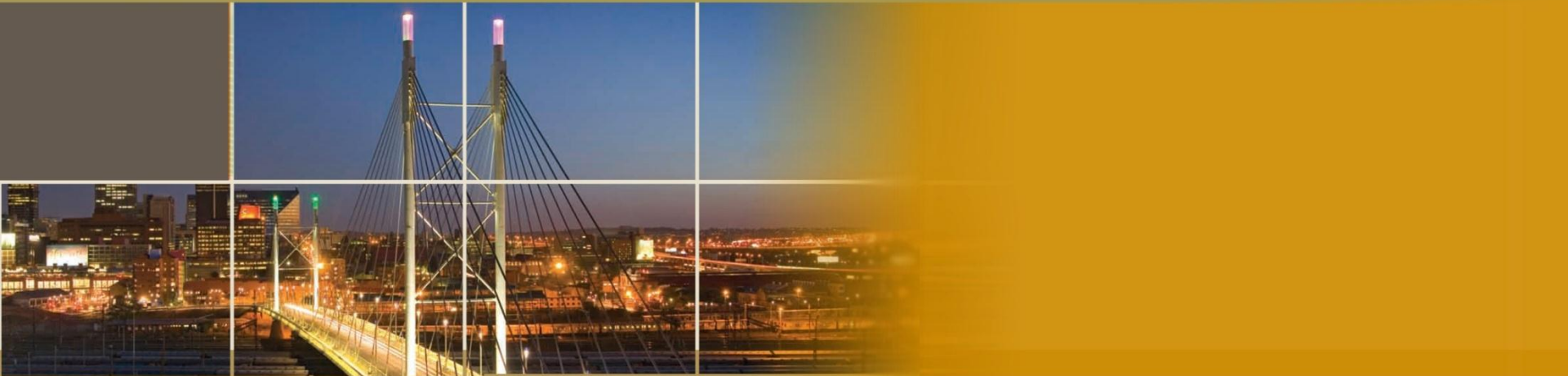




a world class African city



## **Water, Biodiversity and Open Space**

**Johannesburg Business Forum  
Environmental Sector  
November 2016**

## Vision

“Conservation of the City’s natural resources to ensure sustainable delivery of ecosystem benefits, and access for all citizens to safe, potable drinking water”

## Mandate and Objectives of the Unit

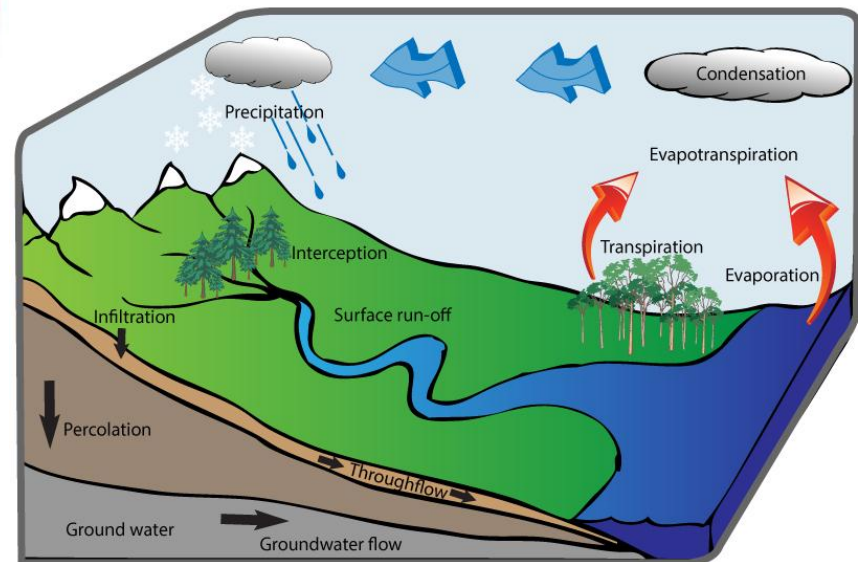
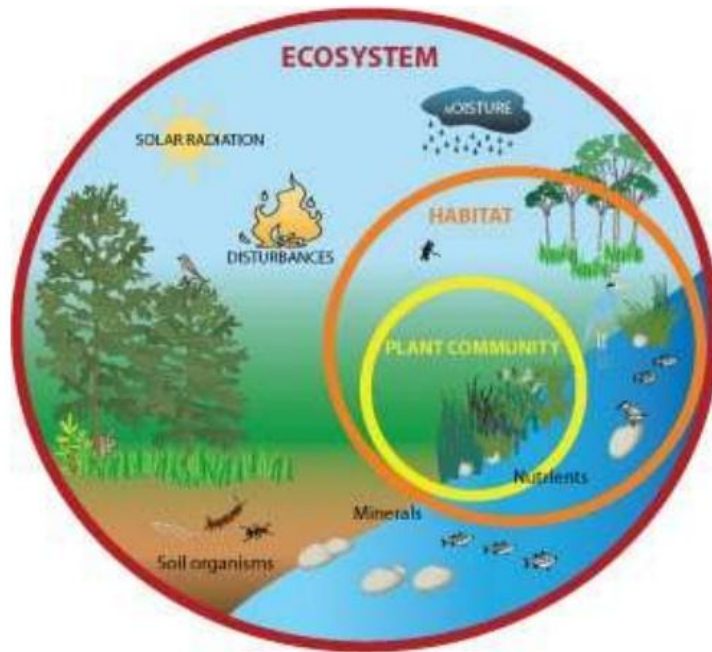
- Development and implementation of policies, strategies and regulatory instruments
- Protection of the City’s water catchments
- Biodiversity Protection and Open Space Planning
- Conservation of the City’s natural resources and associated ecosystem goods and services
- Regulation of water services supply to the citizens of the City of Johannesburg

through the development and implementation of policies, strategies, regulatory or enabling tools, and strategic programmes and projects.



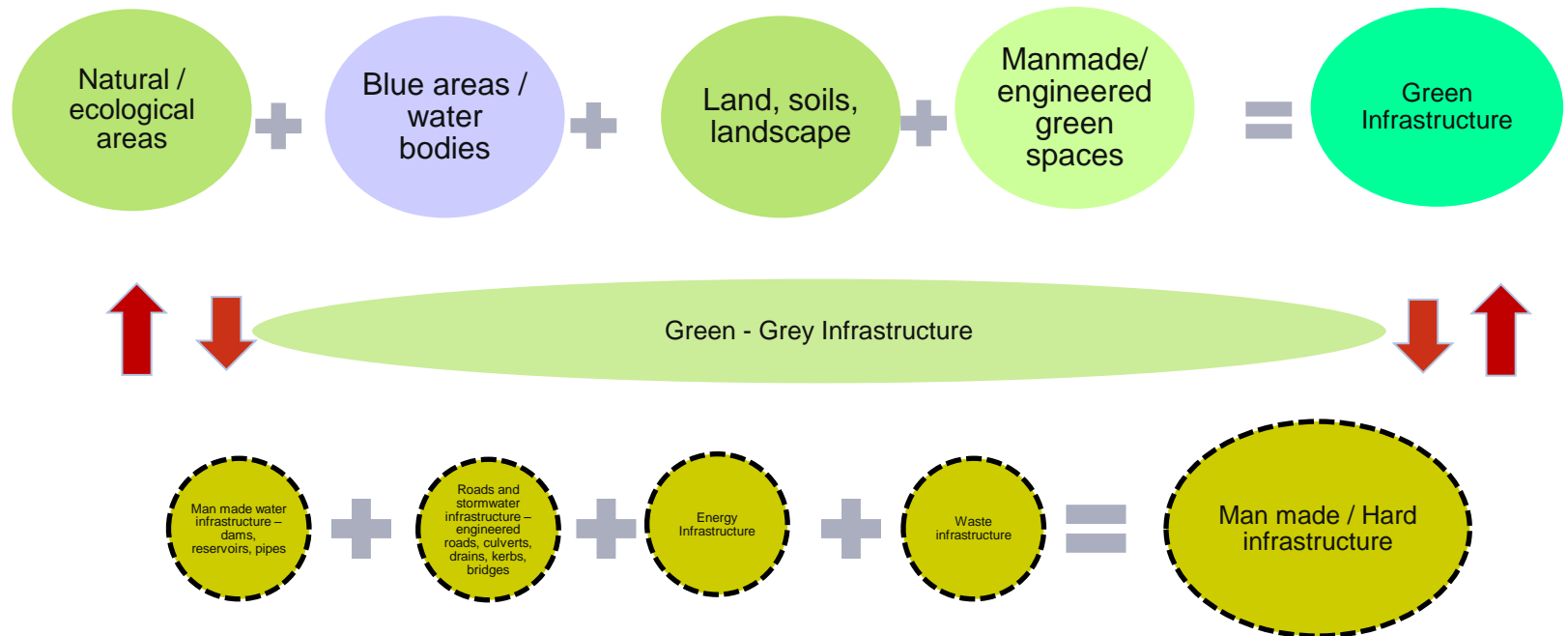
The Directorate is custodian of the City's Eco System

## THE ECOSYSTEM



# Water, Biodiversity and Open Space are the City's Life Support System

- Water, Biodiversity and Open Space can also be regarded as the City's 'Ecological Infrastructure'
- This is a network of multi functional green and blue natural resources
- Ecological infrastructure refers to natural ecosystems that deliver tangible services to people and underpins sustainable socio-economic development
- These are finite resources and cannot be replaced.
- An expanded definition which includes natural and complementary environmentally engineered infrastructure can be referred to a "Green Infrastructure"





# Water, Biodiversity and Open Space are the City's Life Support System

- ❑ Ecological infrastructure is essential for sustainable development and for the City to thrive (conservation of natural resources, healthy eco systems - SDGs)



- ❑ *“...While investments in built infrastructure have been ever-increasing, we have not been investing sufficiently in our ecological infrastructure...”*
- ❑ *Extract from Engineering news: “Studies show that strategic investment into a country's ecological infrastructure can enhance and extend the life of existing built infrastructure and reduce the need for additional human-made infrastructure, while offering considerable job-creation potential.”*
- ❑ *Extract from Sept 2016 GCRO research report “A Framework for a Green Infrastructure Planning Approach in the Gauteng City Region “...GI has the ability to alter the way in which urban landscapes are perceived and managed in the GCT and presents a planning opportunity to meet its developmental priorities.”*





- Supports human well being and liveable communities
- Promotes physical activity, health, and social inclusion
- Enables food production
- Supports a safe and secure city
- Promotes identity and psychological well being
- Preserves areas of scenic beauty and cultural value







- **Water is an essential input for economic development**
- **Open Space resources promotes investment through enhancing visual amenity**
- **Ecological infrastructure helps to protect man made infrastructure and reduce the need for costly man made infrastructure**
- **Green infrastructure solutions can be cheaper over the longer term**
- **The Green Jobs Report finds that the majority of the jobs related to the green economy are likely to emerge from natural resources management**
- **Natural resources underpin eco tourism**



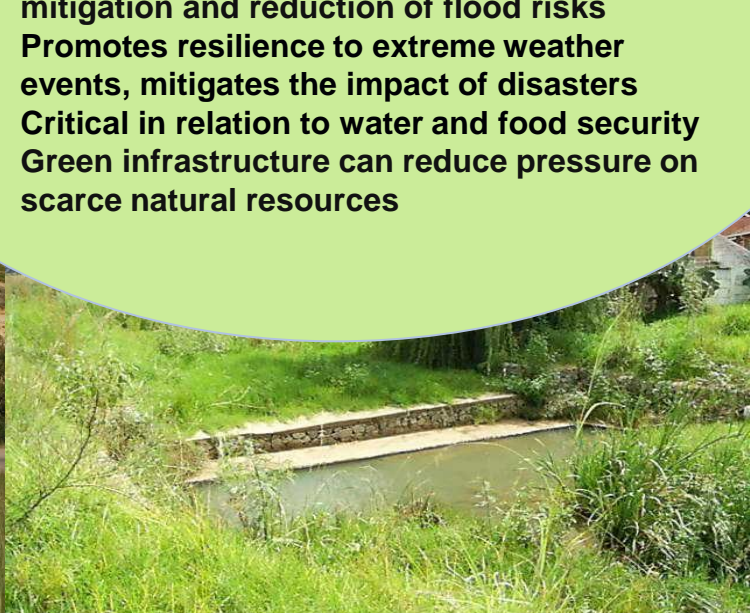


# Ecosystem services – Ecological

## Also climate regulation, adaptation, resilience



- **Secures critical habitats and ecological systems**
- **Improves microclimate and air and water quality, reducing ‘urban heat island’ effects**
- **Facilitates groundwater recharge and assist with filtration of pollutants**
- **Critical to sustainable urban drainage and mitigation and reduction of flood risks**
- **Promotes resilience to extreme weather events, mitigates the impact of disasters**
- **Critical in relation to water and food security**
- **Green infrastructure can reduce pressure on scarce natural resources**





# Water, Biodiversity and Open Space are fundamental to the developmental goals of the City

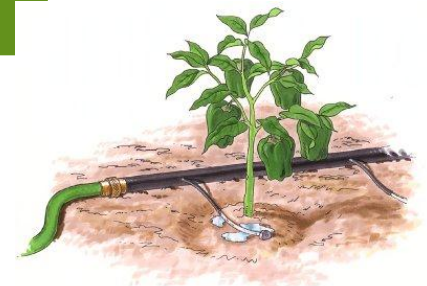
## Strategic Framework – GDS 2040 Outcomes



# Water, Biodiversity and Open Space are fundamental to the developmental goals of the City

Also fundamental to many of the GDS priorities which have been carried through into the IDP

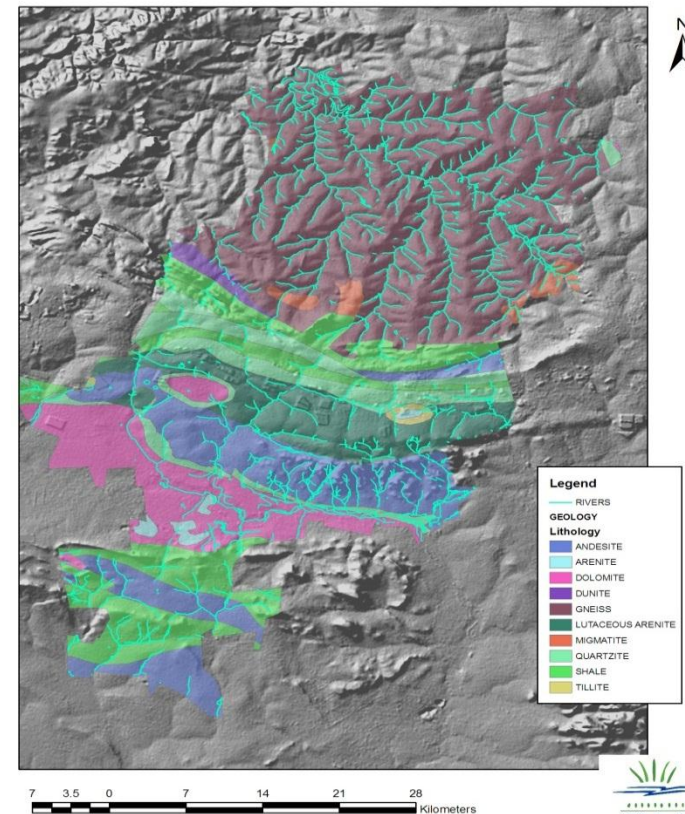
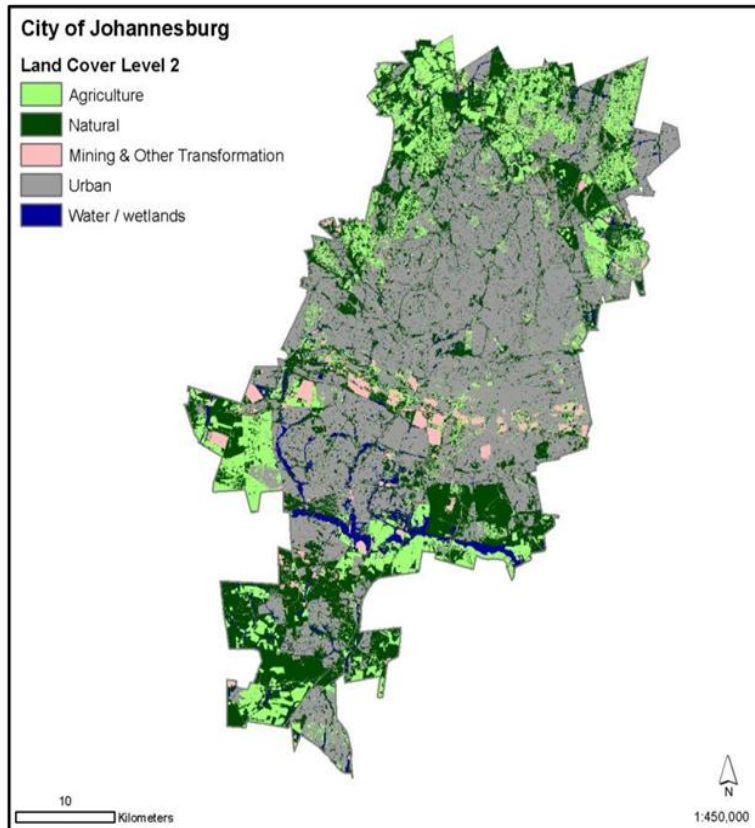
- Financial sustainability
- Climate Change and Resource Resilience
- Building Safer Communities
- Agriculture and Food Security
- Green Economy
- Smart City





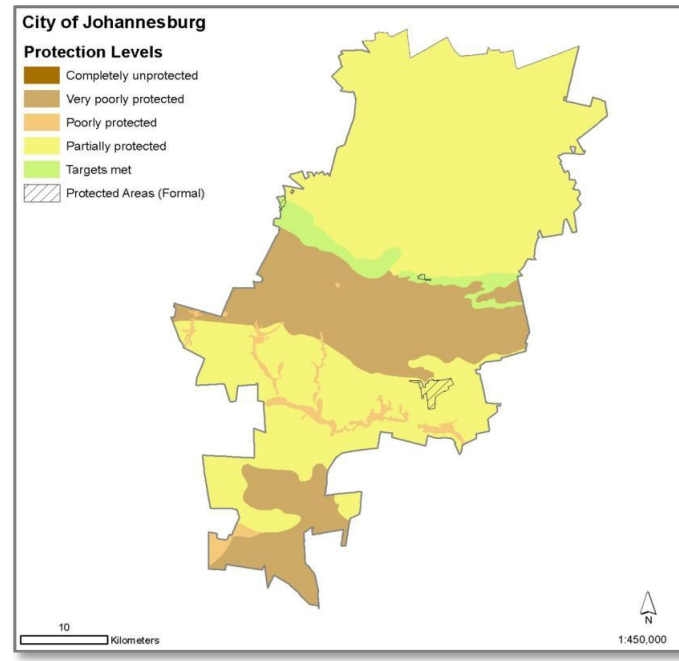
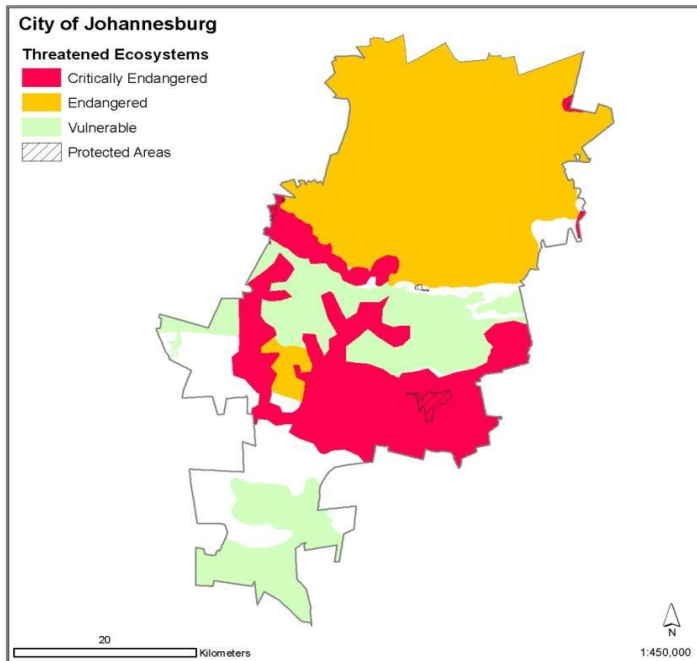
# Current trends – Water, Biodiversity and Open Space

- Urban development driving loss of biodiversity and conservation areas, degradation of open space and water resources
- Expansion of built up areas at the cost of natural open space and agricultural land
- Loss of habitats and ecosystem goods and services
- Less than a third of the City of Johannesburg is in a natural or near natural state (32%), with urbanization (48%), agriculture (16%) and mining (3%) together covering 68% of the City.
- Aquatic eco-systems are also under pressure, with 100% of wetlands types and 20% of river types in the City listed as threatened.



# Current trends – Water, Biodiversity and Open Space

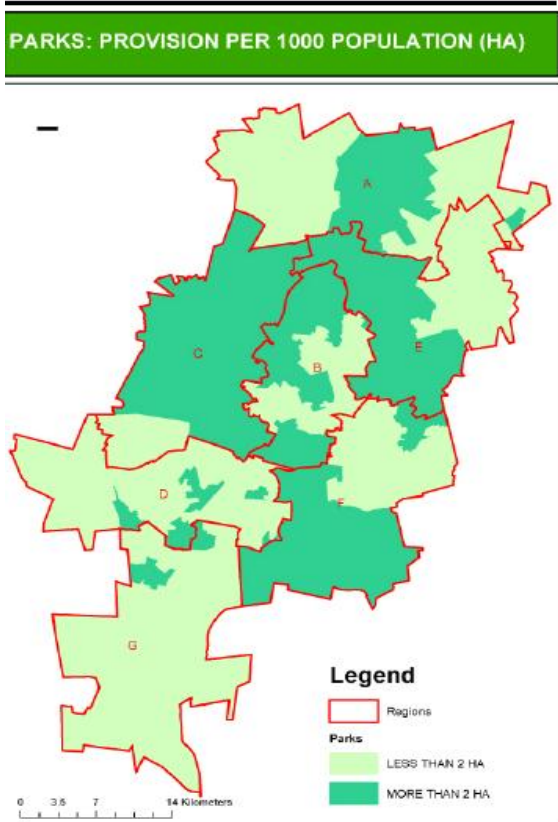
- The City of Johannesburg has high percentage of rare and threatened species and threatened ecosystems but these are disappearing rapidly and only a small percentage enjoys formal protection (less than 1%).
- Critical Biodiversity Areas cover 18% of the City of Johannesburg and Ecological Support Areas cover a further 16% of the City.
- Protected Areas cover less than 1% of the City of Johannesburg and one ecosystem is very poorly protected, two are poorly protected and five are partially protected.





# Current trends – Water, Biodiversity and Open Space

- Under provision of social open space in many regions when compared with desired standards
- Many open spaces and sites zoned for parks are not developed so not utilized and perceived as problem areas
- Not just about quantity but also connectivity and quality



- Scarcity of water supply
  - Water scarce country and region
  - Growing demand exceeding supply
  - Inadequate management of total water balance

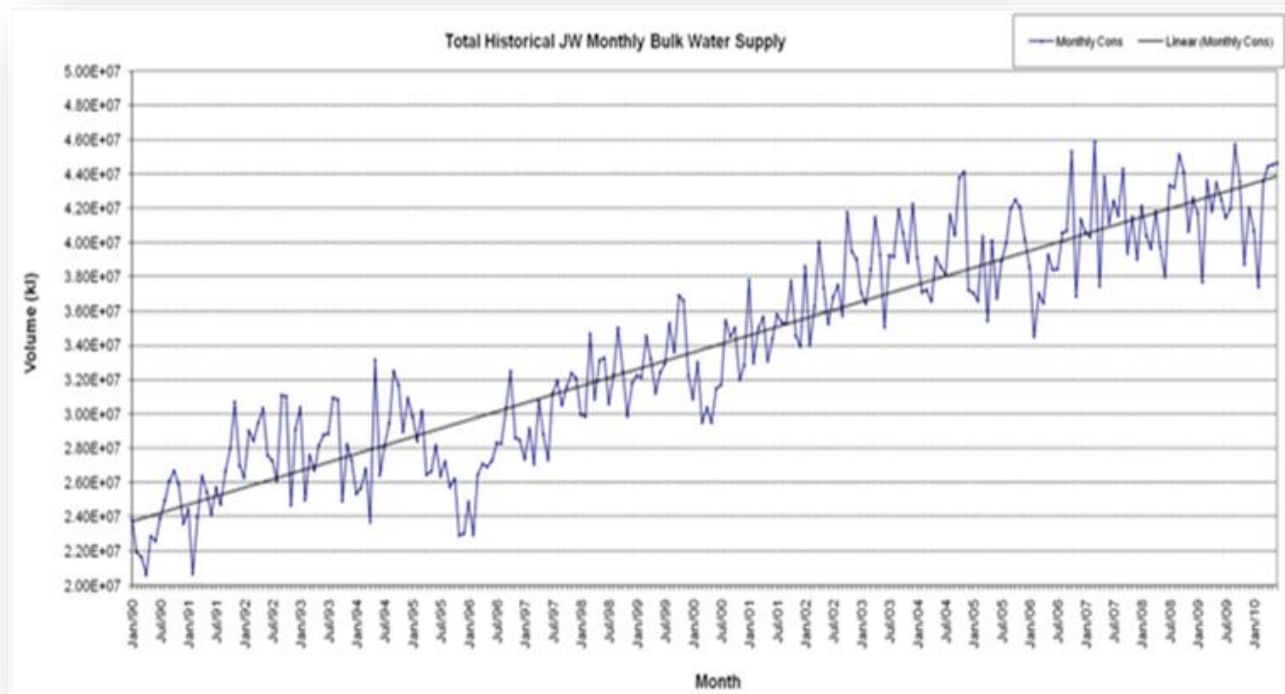


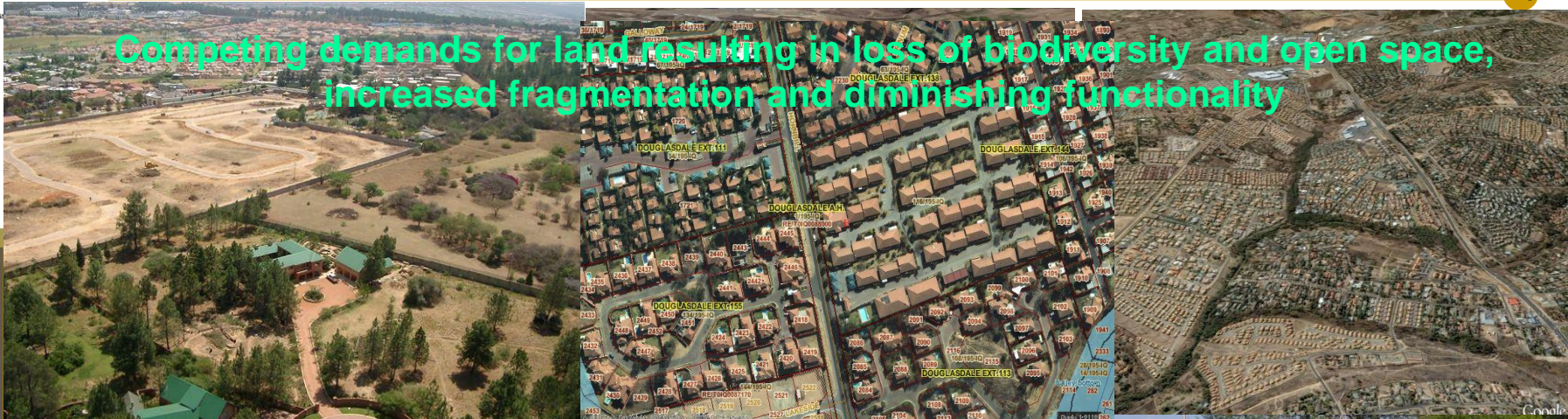
Figure : JW bulk water purchases trend



# Challenges – Water, Biodiversity and Open Space

## Loss of Eco system services

Competing demands for land resulting in loss of biodiversity and open space, increased fragmentation and diminishing functionality



Limited resources for park development, maintenance and securing of open spaces and conservation areas



Management challenges – alien and invasive species, uncontrolled burning/ increased fire frequencies, illegal dumping, illegal business and trading activities





# Challenges – Water, Biodiversity and Open Space

## Loss of Eco system services

Poor Surface Water Quality and River Health  
Deteriorating aquatic eco systems  
Groundwater contamination  
Threats to human health

Pollution to watercourses from failing WWTW,  
ageing infrastructure, sewer spills, illegal  
discharges, informal activities, mining, landfills.





# Challenges – Water, Biodiversity and Open Space

## Loss of Eco system services

Loss Morphological stability and hydrological functionality

Development over natural drainage and recharge areas, encroachments into flood plains, river flow modification, inadequate management of stormwater and urban drainage

Erosion, bank collapse, channelling. High rates of sedimentation,





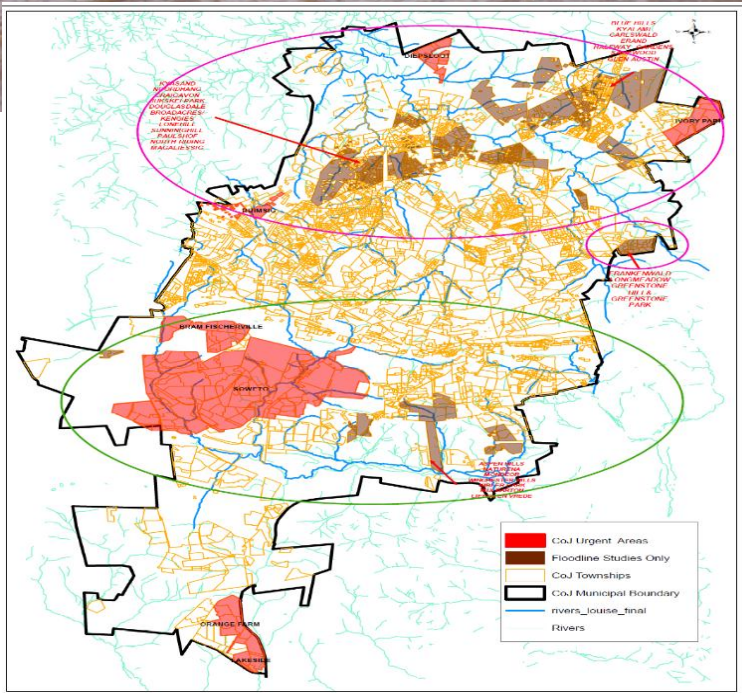
# Challenges – Climate Change Impacts



Change impacts and risks  
 More intense storm events  
 Drought and Flooding  
 Loss of species diversity

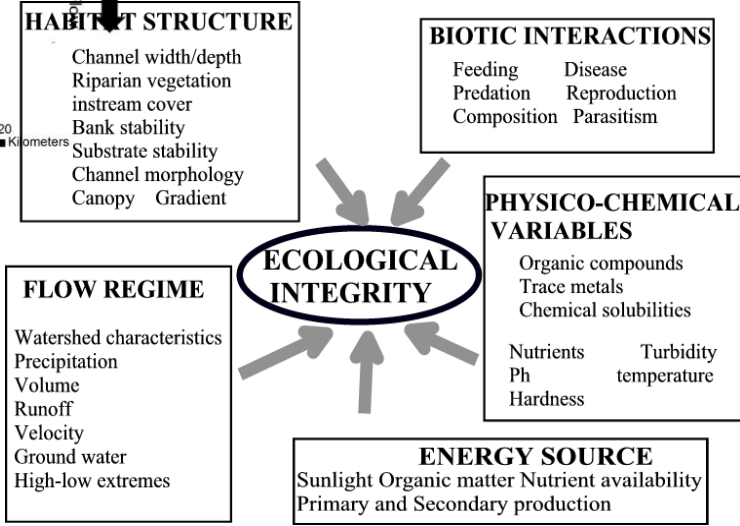
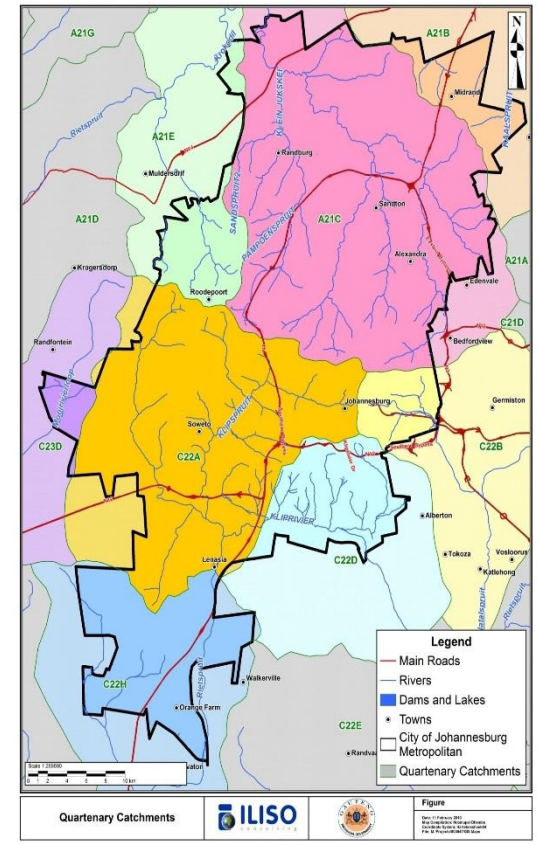
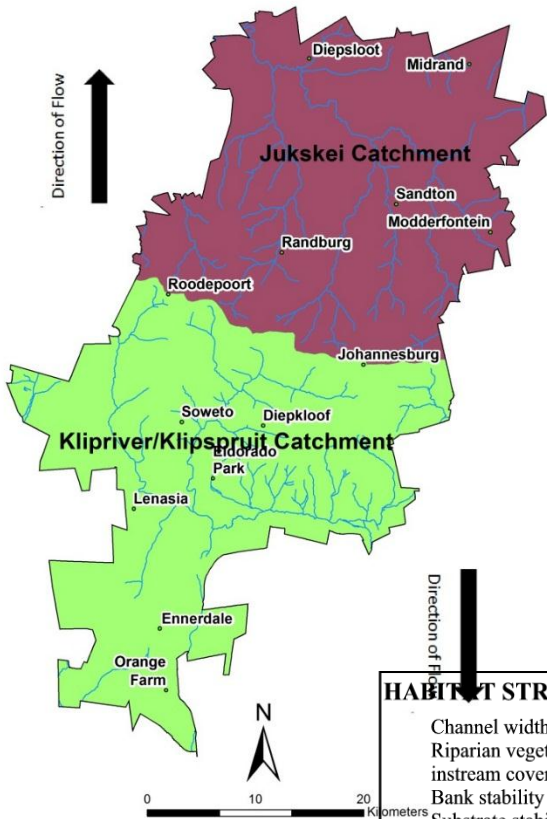


As **climate change** alters temperature and weather patterns, it will also have impact on plant and animal life. Both the number and range of species, which define **biodiversity**, are expected to decline greatly as temperatures continue to rise. ...





# Johannesburg's catchments – State of Rivers as an indicator

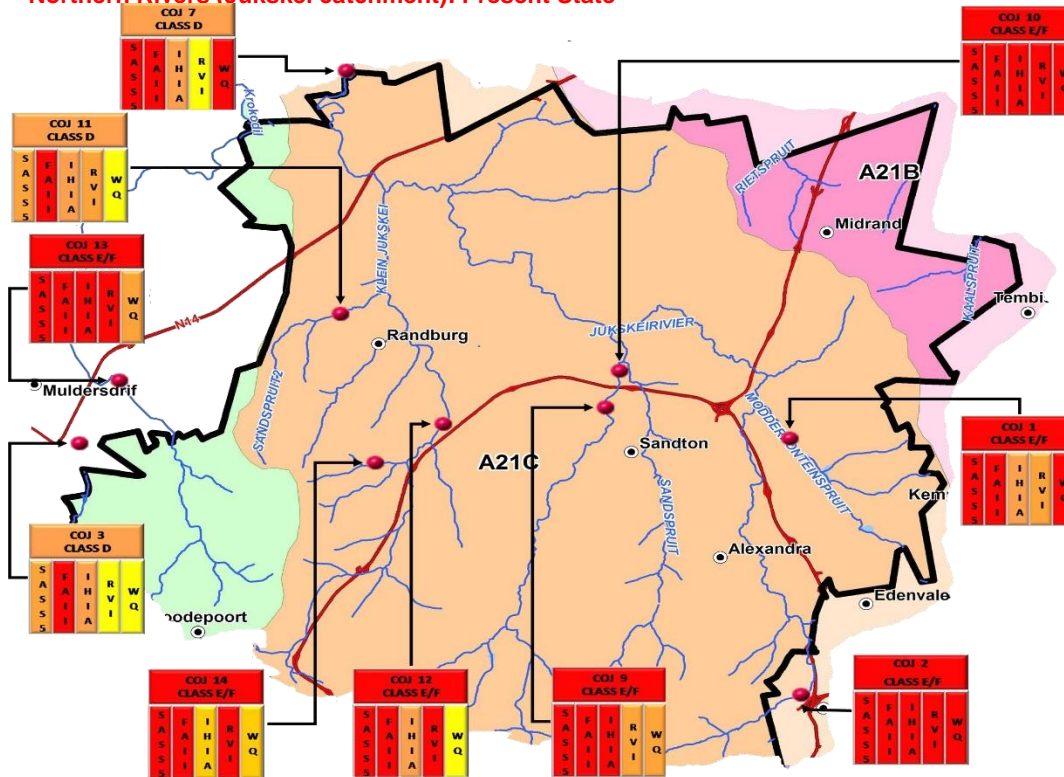


## Situation Analysis(2010 Assessment)

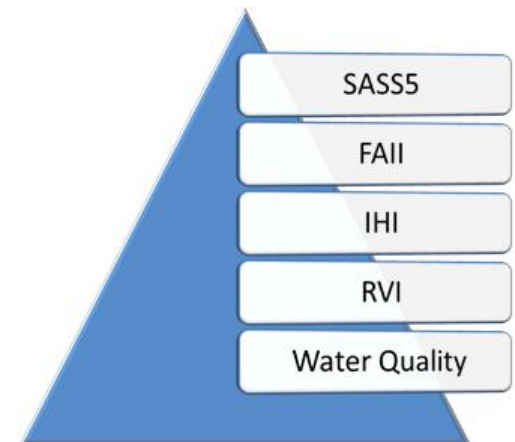
What informs problem statement: Facts & Figures –

### State of River

#### Northern Rivers (Jukskei catchment): Present State



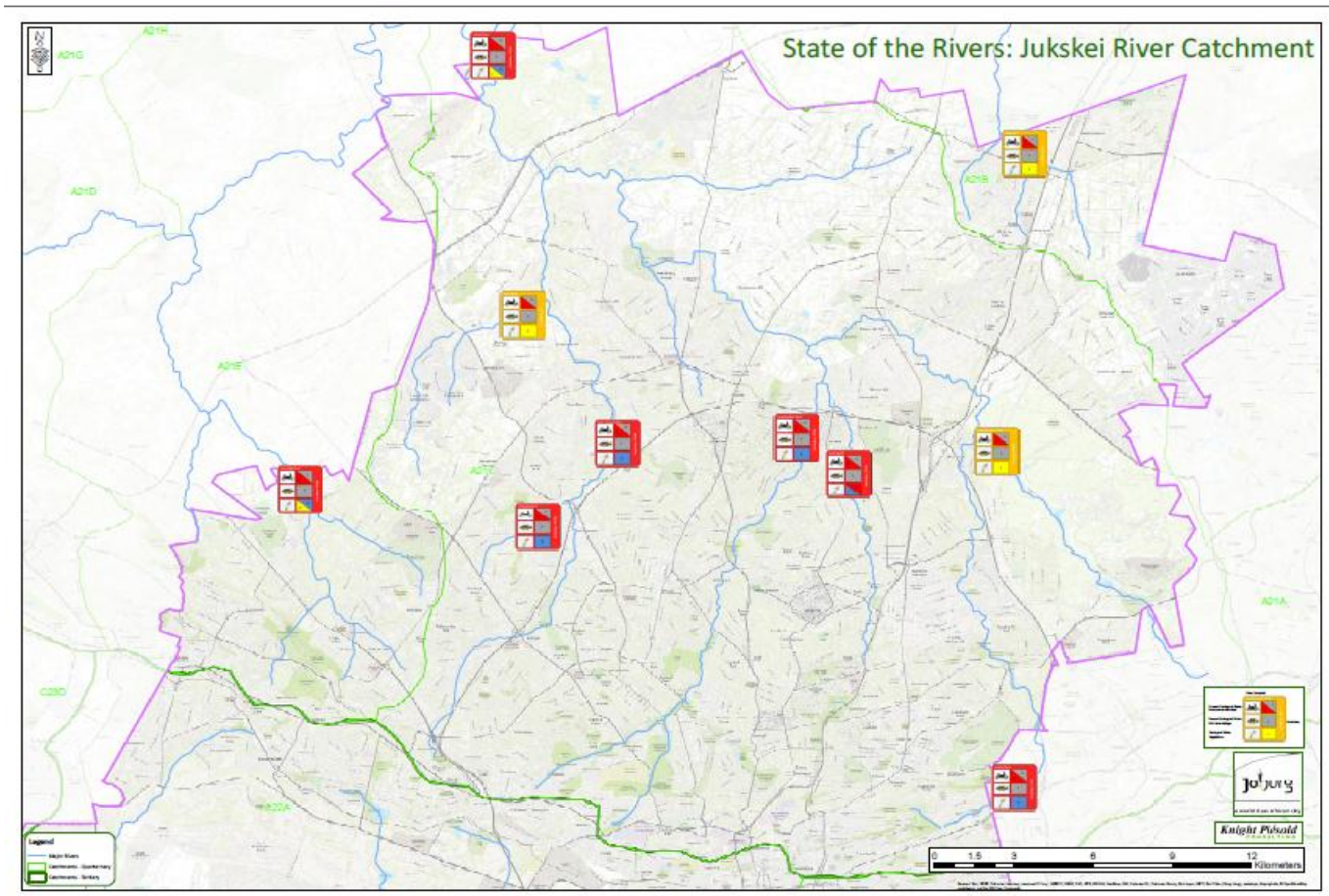
CLASS	DESCRIPTION
A	Unmodified, natural
B	Largely natural, few modifications
C	Moderately modified
D	Largely modified
E	Extensively modified
F	Critically modified





## Situation Analysis - 2015/16 Assessment

Slight deterioration - All rivers classified as D (largely modified), E (extensively modified), and F (critically modified)



## Some achievements to date

### Water Resource Management

- Data and monitoring – Surface Water Monitoring Programme, State of Rivers Reports
- Rehabilitation and management of Water Management Units to improve rivers, wetlands and impoundments (10 WMU in Klip Catchment, 8 WMU in Jukskei Catchment) through:
  - Monitoring of water quality and River Health Assessment
  - Preparing water quality management plans
  - Controlling effluent discharges, actions to minimise the effects of pollution
  - Rehabilitation projects (Capex) (eg. Bruma Lake)
  - River clean ups (Jozi@work programme)

### Biodiversity Management

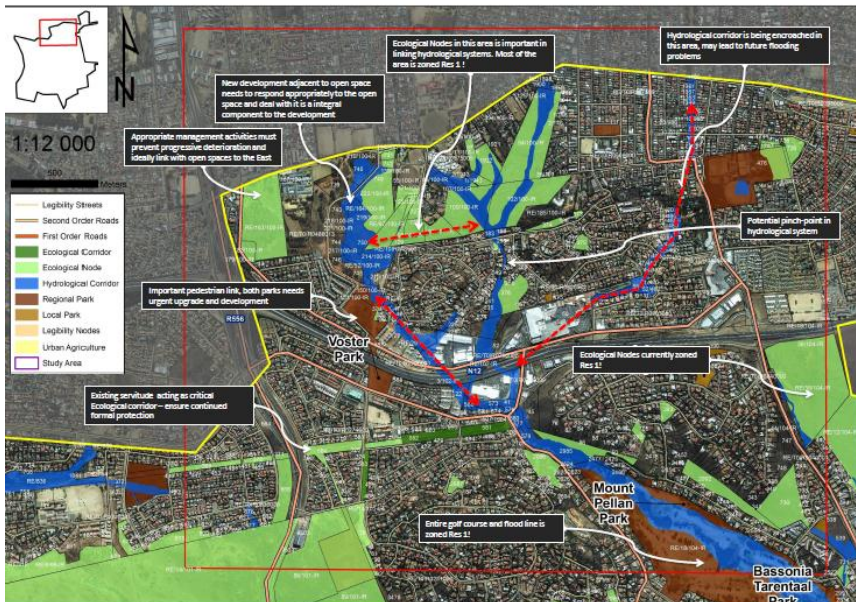
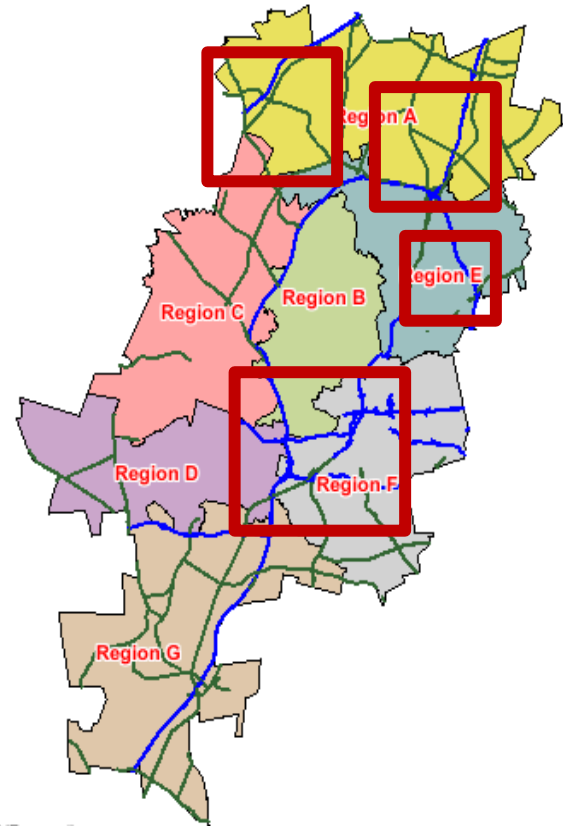
- Bio Regional Plan – identification of CBAs ESAs, promulgation process initiated
- Proclamation of Protected Areas
- Alien Invasives Control Strategy, species control
- Clearing of alien invasive plants (Jozi@work programme)

### Open Space Planning

- Developing data resources – Wetland audits, JMOSS, Updating of flood lines
- Policies and Strategies – Catchment Management Policy, Wetland Protection and Management Plan, Open Space Framework
- Regulatory instruments – Storm Water By Laws and Storm Water Design Manual, JBEGS
- Enabling instruments - Green Servitudes (secure green infrastructure on private land, enable expenditure of public funds on private land, secure critical biodiversity, secure necessary adaptation corridors in support of species adaptation)
- Open Space Plans (Bassonia, Ruimsig, Kyalami, Linbro Park)
- Regularizations of council owned open spaces
- Ongoing input into applications for major developments



# Some achievements to date



3(Joburg), 2000(AOC/Emoyeni)

# What do we want to achieve going forward ?

- ❑ **A water secure and resilient city**
  - Water conservation and demand management
  - Plan for a water sensitive City
  - Sustainable management of water balance and water cycle
  
- ❑ **Achieve improved river health – all rivers to be Class C and D**
  - Planning for well managed catchments – develop and implement Catchment Management Plans for all catchments
  - Rehabilitation - develop and implement rehabilitation plans for all WMUs
  - Manage and maintain
  - Regulate, monitor and enforce
  
- ❑ **Conserve the City's natural assets (including Critical Biodiversity Areas and Ecological Support Areas)**
  - Inventory of natural assets
  - Proclamation of Protected Areas (existing and new areas to be identified)
  - Implementation of Ecological Management Plans
  - Alien and invasive plant control, Species Management
  
- ❑ **Conserve a multi functional network of green infrastructure and open space**
  - Develop and implement Greening Strategy for the City
  - Optimise Green Infrastructure opportunities
  - Ensure adequate and equitable access to social open space for all communities
  - Achieve full coverage of Open Space Plans for the City and ensure application of OSP provisions within spatial planning and development processes
  - Promote Sustainable Urban Drainage and Water Sensitive Urban Design paradigms and implementation of the new Storm water Design Manual provisions – consider storm water as a resource
  - Conserve critical hydrological processes within the landscape





## Authorities and SOEs

- South African National Biodiversity Institute
- Gauteng Department of Agriculture and Rural Development (GDARD)
- Department of Environmental Affairs (DEA)
- Department of Water and Sanitation (DWS)
- Department of Minerals (DMR)
- South African National Biodiversity Institute (SANBI) – including Working for Wetlands
- Catchment Management Forums (Klip, Hennops, Rietspruit, Jukskei)
- Water Research Commission
- NPO's (WESSA, EWT, Birdlife Africa, Greenhouse Project)
- Inter-governmental forums on Acid Mine Drainage
- Cross boundary initiatives (Centurion Lake, Kaalspruit)
- CSIR – research studies
- Wits, UJ, GCRO, UFS – research studies
- Gauteng Wetland Forum

## COJ Partners

- Johannesburg City Parks and Zoo
- Johannesburg Roads Agency
- Johannesburg Water
- Pikitup
- Development Planning
- Environmental Health
- Johannesburg Property Company

- Limited local research for application of green infrastructure solutions
- Paradigm and Concept of Green Infrastructure approaches, Water Sensitive Urban Design, Water Sensitive Cities, is not well understood
- Limited expertise in private and public sectors in respect of hydrological engineering
- Cross sectoral integration is difficult to achieve
- Resistance to change – both from professionals and operational (eg. Depots)
- Overlapping mandates – difficult for the public to know who to approach
- Compliance monitoring is weak – rely on complaints from public and often transgressions already advanced
- Resources for securing and managing land – need for new funding models
- Land ownership – limited control over use of private land





# Collaboration with private sector – existing initiatives and future opportunities

27

- River and Wetland Rehabilitation – Rotary project, Residents Associations initiatives, Businesses adopting rivers through MOU arrangements, offset arrangements
- Park management and maintenance – community initiatives, business partnerships, custodial agreements (eg. Kaalfontein, Paulshof, Bruma, Little Falls)
- Golfing sector – water conservation and re-use, opportunities for enhancement of habitat
- Ridge protection – partnerships with residents
- Greening, regeneration and urban agriculture projects – collaboration with business
- Water quality improvement and water conservation – technological innovation partnerships
- Biodiversity protection – collaboration with residents associations and environmental groups eg. Glen Austin Bullfrog Pan, Boskruin Koppie, stewardship agreements
- Alien invasive plants clearing, species control
- Community advocacy groups
- Eco tourism possibilities
- Innovative funding mechanisms
- Best practice demonstration projects

