Durban Research Action Partnership

UKZN – eThekwini Municipality
Global Environmental Change Research Programme
Annual Report

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Comments:

Durban Research Action Partnership
for Biodiversity, Climate and People
An Embedded Researcher approach to integrate climate information into decision making in southern African cities

Lulu van Rooyen, Anna Taylor, Kornelia Ipinge, Brenda Mwalukanga, Hecrálito Mucavele, Rudo Mamombe, Sandra Zenda & Alice McClure
Why a monitoring programme?

1. ...based on baseline data and knowledge generated through D’RAP

- Quantifying ecological restoration
- Nutrient cycling & remote sensing
- Mammal diversity in D’MOSS
- Biodiversity and novel ecosystems
- Success of tree planting
- Seedling recruitment and productivity
- Floristic studies of the KZNSS
- Spatial and temporal fire assessment
- DNA barcoding of Araneae
- Testing water quality using miniSASS
- Cultural ecosystem services

- Carbon sequestration
- Soil Green House gas emissions
- Small mammal diversity and diet
- Soil biodiversity in restoration
- Organic chemical pollutants
- Chromoleana odorata growth
- Invertebrate bioindicators
- Forest bird diversity, D’MOSS
- Vervet monkeys in eThekwini
- Bracken fern cover
- Woody-herbaceous ratio
Why a monitoring programme?

1. ...based on baseline data and knowledge generated through D’RAP

2. ... monitoring to track the effect of climate change on biodiversity

“... the programme has started generating baseline biodiversity data to monitor the long-term effects of climate change ...”
Broad steps followed

1. Literature review on existing monitoring programmes
2. Network building and stakeholder engagements. Locating and exploring existing biodiversity monitoring initiatives in the City
3. Workshops
4. Developing the framework
5. Specialist and focal group meetings
6. Prioritising focal areas of monitoring
7. Developing indicators
Long-term biodiversity monitoring – Process

STEP 1: Defining the aim (WORKSHOP)
Agreement on an aim and objectives for the monitoring, by all stakeholders
Agreeing on the approach

STEP 2a: Evaluation of monitoring indicators (WORKSHOP)
1. Biodiversity elements
   - Plant species
   - Mammal species
   - Range shifts, community composition, phenological changes, migration changes
   - Insects
   - Avian species

2. Ecosystem processes
   - Aquatic ecosystems
   - CO2 flux
   - Ecosystem sensitivity, range shifts, threats; temperature, water flow, sedimentation, invasive encroachment,
   - Biome ranges
   - Invasive species

3. Climate change tracking
   - Weather station data

STEP 2b: Site selection (WORKSHOP)
- Protected Areas
- PA’s, D’MOSS, Tribal land
- All

STEP 3: Data collection logistics (WORKSHOP)
Costs, intensity, periodicity
Viable methods?
Municipality technical assistant/university students/citizen science

STEP 4: Housing (WORKSHOP)

STEP 5: Awareness raising (WORKSHOP)

STEP 6: Implementation (November 2018)
High level aim development: “To supply data ... on important biodiversity trends relating to global change threats such as climate- and anthropogenic environmental change ...”

Several parallel streams of data entering a centralized database

A visible platform, which collates various streams of data for users

Flexibility and adaptability

Must be embedded in the EPCPD by building monitoring staff capacity

Trend identification, with external partnerships driving the resulting research

Draw and build on various partnerships

Include citizen science, green job creation

Proper Data Management
Draft Framework

AIM

Overarching aim for the monitoring system

Desirable outcomes for the City

Desirable outcomes for natural capital

Monitoring Programmes - each guided by a protocol document with own context, objectives and character

Sets of themes for indicators

Human outcomes

Human use/benefits

Sustainability

Resilience

Integrity

Draft Framework
To supply data to the EPCPD ... on important biodiversity trends relating to global change threats such as climate- and anthropogenic environmental change.
EPCPD Biodiversity Strategy

4. Durban’s Biodiversity Strategy: S.M.A.R.T. Objectives

Objectives are realistic targets for a work area.

To ensure that the DBSAP is meaningful and effective, the S.M.A.R.T principle (SPECIFIC, MEASURABLE, ATTAINABLE, RELEVANT, TIME-BOUND) has been applied when defining objectives for broad work areas. These are, however, high level objectives and greater detail will be found in specific strategies and project plans.

<table>
<thead>
<tr>
<th>Goal</th>
<th>Objectives</th>
<th>Responsible</th>
<th>IPP Indicator</th>
<th>Outcome Indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Spatial Planning</td>
<td>To identify biodiversity priority areas and incorporate these into spatial and strategic planning processes</td>
<td>Biodiversity significant areas will be identified based on the best available science by updating the Systematic Conservation Assessment and a revised Critical Biodiversity Area map will be produced. Following the update of the SCA layers, the Systematic Conservation Planner and Regional Coordinator will update the D’MOSS layers using the output of the revised SCA and initiate the approval processes by advertising, engaging the public, and submitting a report to council.</td>
<td>Systematic Conservation Planner / Regional Coordinator</td>
<td>‘Are we doing our work’</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>Status indicator: Biennial - SCA updated - Critical Biodiversity Area map produced</td>
<td>- Amount of hectares added - Sensitive habitat extent</td>
</tr>
</tbody>
</table>

- xxx nr of adverts
- xxx nr of public engagements
- report submitted to council
<table>
<thead>
<tr>
<th>Goal</th>
<th>Objective</th>
<th>Data to support this objective</th>
<th>Potential Indicator</th>
<th>What does this measure?</th>
</tr>
</thead>
</table>
| GOAL 3: MANAGEMENT To increase the area under management and management effectiveness of areas identified for biodiversity conservation and the supply of ecosystem services. | Undertake effective control of biological invasions by preventing new invasions and managing existing invaded areas as per the Invasive Alien Species Strategy. | - Prioritised site surveys  
- CRP site data (Buffelsdraai)  
- FISC site data  
- WfE site data                                                                 | Nr. of, and nature of responses to, identified emergent species per year  
Amount of budget (finances) secured from Municipal Treasury, allocated to IAS control, factored against levels of invasions on all managed sites, in a financial year  
Amount of cleared invaded areas per year as a % of invaded areas on managed sites  
Rate of invasion vs rate of clearance/control. | The rate of emergent species per year, and the REB’s response to it.  
The realistic IAP control capabilities of the branch  
Success of REB’s clearance strategy  
The condition of grasslands under IAP invasions, woodification and urbanization pressures.  
The realistic management of habitats with the resources available in a municipality. |
|                                                                       | Undertake fire management of prioritised land parcels every financial year.                                                                                                                                | - VCA data.  
-Prioritised site surveys  
-Historical burn data                                                                 | Change in veld condition (grass condition, fuel potential, erosion, veld states, and woody and -grass densities) over time with adapted fire application  
Rates of woody encroachment. | Densification pressure under CO₂ increase  
The integration of biodiversity, social accountability, and economic development |
Way forward and learnings

• Combining the ‘strategy monitoring’ and the larger framework
• Aligning the indicators to existing global indicators: Biodiversity Indicators Partnership, Convention of the Biological Diversity, NBSAP, GEOBON Essential Biodiversity Variables and SANBI’s NBAs and monitoring
• For it to be embedded capacity (data manager) has to be developed in the EPCPD
• Identifying the requirements for database infrastructure and capacity
• More capacity – budget, expert support, personnel, partnerships. How to find the path of least resistance
• TD processes take time - be realistic