12th National Biodiversity Planning Forum

23 – 26 June 2015

Salt Rock Hotel and Beach Resort, KwaZulu-Natal

Programme overview: Tuesday 23 June 2015	
Time	**Venue: Salt Rock Hotel and Beach Resort**
11:00 – 13:00	REGISTRATION
13:00 – 14:00	LUNCH
Time	**Venue: Marlin Room**
14:00 – 14:10	Welcome and introduction
14:10 – 14:20	Purpose of the Forum and programme overview
14:20 – 14:55	Keynote address: Five Futures: interpreting the IPCC scenarios in a local context (Professor Bob Scholes, Wits)
14:55 – 15:30	Keynote address: The Phakisa MPA journey: 21 new Marine Protected Areas on the map! (Dr Kerry Sink, SANBI)
15:30 – 16:00	TEA
16:00 – 17:30	National highlights, new projects and updates
Time	**Venue: Royal Palm Room**
17:30 – 19:00	Official welcome by SANBI CEO, **Dr Tanya Abrahamse** Interactive poster and exhibition display sponsored by the SANBI Invasive Species Programme **Please bring posters, maps, brochures and other printed material you would like to display**
19:00	DINNER

Programme overview: Wednesday 24 June 2015	
Time	**Venue: Marlin Room**
08:30 – 10:00	Plenary: Integration of biodiversity planning into the Strategic Integrated Projects (SIPs): Electricity Grid Infrastructure
10:00 – 10:30	**GROUP PHOTO** AND TEA
10:30 – 12:00	Plenary: Integration of biodiversity planning into the Strategic Integrated Projects (SIPs): Shale Gas Development
12:00 – 13:00	LUNCH
Time	**Venue: Marlin Room**
13:00 – 15:30	Plenary: Protected area expansion
15:30 – 16:00	TEA

Time	**Venue: Marlin Room**	**Venue: Royal Palm Room**
16:00 – 17:30	SPLUMA National Land Use Classification	Guidelines for invasive species management plans
17:30 – 19:00	Networking opportunity and informal discussions	
19:00	DINNER	

Programme overview: Thursday 25 June 2015			
Time	**Venue: Marlin Room**		
08:30 – 10:30	Plenary: Ecosystem classification and mapping		
10:30 – 11:00	TEA		
Time	**Venue: Marlin Room**		
11:00 – 13:00	Plenary: Assessing and mapping ecological condition		
13:00 – 14:00	LUNCH		
Time	**Venue: Marlin Room**	**Venue: Royal Palm Room**	
14:00 – 15:30	Maximising the application value of the National Land Cover 2013/14 (NLC 2013/14) data	Strengthening the science-policy interface for effective planning: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)	
15:30 – 16:00	TEA		
Time	**Venue: Marlin Room**	**Venue: Sails Room**	**Venue: Royal Palm Room**
16:00 – 17:30	Maximising the application value of the National Land Cover 2013/14 (NLC 2013/14) data (session continued)	Setting targets for species in biodiversity plans	Strengthening the science-policy interface for effective planning: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (session continued)
17:30 – 19:00	Evening discussion: brainstorming on novel datasets for biodiversity planning		
19:00	DINNER		

Programme overview: Friday 26 June 2015		
Time	**Venue: Marlin Room**	**Venue: Royal Palm Room**
08:30 – 10:30	Implementing biodiversity plans: case studies, lessons and challenges	Identifying priority ecological infrastructure in the uMngeni River catchment
10:30 – 11:00	TEA	
Time	**Venue: Marlin Room**	**Venue: Royal Palm Room**
11:00 – 12:30	Implementing biodiversity plans and accessing biodiversity data	Innovative approaches and methodologies
Time	**Venue: Marlin Room**	
12:30 – 13:00	Evaluation, thanks and close of 2015 Forum	
13:00	LUNCH	

Session descriptions and presentations: Tuesday 23 June 2015	
Plenary session: Welcome and opening	
Venue: Marlin Room	
Facilitator: Deshni Pillay	
14:00 – 14:10	Welcome and introduction (**Kristal Maze**, SANBI)
14:10 – 14:20	Purpose of the Forum and programme overview (**Tammy Smith**, SANBI)
14:20 – 14:55	Keynote address: Five Futures: interpreting the IPCC scenarios in a local context (**Professor Bob Scholes**, Wits)
14:55 – 15:30	Keynote address: The Phakisa MPA journey: 21 new Marine Protected Areas on the map! (**Dr Kerry Sink**, SANBI)
15:30 – 16:00	TEA
Plenary session: National highlights, new projects and updates	
Venue: Marlin Room	
Facilitator: Deshni Pillay	
Description This session includes a series of presentations providing updates on national initiatives and processes including highlights of some of the key biodiversity planning achievements over the past year. Some of these presentations provide an introduction to more detailed discussion sessions later in the Forum programme.	
16:00 – 17:30	1. Biodiversity planning highlights 2014-15 (**Tsamaelo Malebu**, SANBI) 2. National Biodiversity Assessment 2018 (**Andrew Skowno**, SANBI) 3. Building biodiversity data infrastructure for science and decision-making (**Brenda Daly**, SANBI) 4. National Land Cover 2013/14 (NLC 2013/14) to inform DEA's operational requirements (**Nicolene Fourie**, DEA) 5. SANBI's Invasive Species Programme: taking the NEMBA regulations forward (**Philip Ivey**, SANBI) 6. Introduction to ecosystem accounts (**Mandy Driver**, SANBI)
Poster and exhibition session	
Venue: Royal Palm Room	
Facilitator: Kristal Maze	
17:30 – 19:00	Official welcome by SANBI CEO, **Dr Tanya Abrahamse** Interactive poster and exhibition session sponsored by the SANBI Invasive Species Programme **Please bring posters, maps, brochures and other printed material you would like to display**
19:00	DINNER

Session descriptions and presentations: Wednesday 24 June 2015
Morning sessions (08:30 – 12:00)
Plenary session: Integration of biodiversity planning into the Strategic Integrated Projects (SIPs)

Venue: Marlin Room

Facilitator: Jeffery Manuel

Description

The Department of Environmental Affairs has initiated Strategic Environmental Assessments (SEAs) to support the implementation of some of 18 Strategic Integrated Projects (SIPs) as identified by the Presidency. The SIPs cover a range of economic and social infrastructure projects across all nine provinces. SANBI and the CSIR, together with the Council of GeoScience, have been appointed by DEA to develop the SEAs for a number of the SIPs. This session will focus on the integration of biodiversity planning information into the SEAs for Electricity Grid Infrastructure, Wind and Solar Energy, as well as the recently launched SEA for Shale Gas Development. The session will:

- highlight the data used for each SIP analysis
- highlight the anticipated data needs for future SIPs
- reflect and discuss data input layers that have been available and what can/should be done as a community to improve these input layers
- reflect and discuss the outputs produced or planned outputs for future SIPs.

08:30 – 10:00	1. Background and update on the SEA for the Electricity Grid Infrastructure (**Wisaal Osman**, CSIR) 2. Detailed presentation on Electricity Grid Infrastructure analyses (**Fahiema Daniels**, SANBI) 3. The Wind and Solar SEA analyses, focusing on the biodiversity component (**Lydia Cape-Ducluzeau**, CSIR)
10:00 – 10:30	**GROUP PHOTO** AND TEA

Plenary session: Integration of biodiversity planning into the Strategic Integrated Projects (SIPs)

Venue: Marlin Room

Facilitators: Anthea Stephens and Jeffery Manuel

Description

This is a continuation of the previous session with a focus on the biodiversity component of the SEA for Shale Gas Development, which was launched recently.

10:30 – 12:00	1. Outline of the Shale Gas SEA multi-author process with a focus on the biodiversity component (**Luanita van der Walt**, CSIR) 2. Planned analyses for the biodiversity component: improving our taxonomic understanding; and landscape level scenario analysis (**Jeffery Manuel**, SANBI) 3. Open discussion session for feedback/recommendations/comments to the project team. The scope of the discussion will cover the approach, data, analyses, technical and consultation processes, as well as stakeholders relevant to the SEA.
12:00 – 13:00	LUNCH

Session descriptions and presentations: Wednesday 24 June 2015	
Afternoon session (13:00 – 15:30)	
Plenary session: Protected area expansion	
Venue: **Marlin Room**	
Facilitator: Kristal Maze	
Description The National Protected Area Expansion Strategy is currently being updated and the focus of this session will be on how to build the NPAES up from existing provincial spatial priorities as well as other national spatial priorities identified in marine, estuarine and freshwater environments. The session will start with inputs from a number of provinces on identifying spatial priorities for expansion, achieving protected area targets and sustaining these investments. These inputs will be followed by an open discussion session to get agreement on the way forward for incorporating provincial spatial priorities (including marine, estuarine and freshwater) into the revised NPAES as well as agreement on an initial approach to dealing with gaps, overlaps and alignment issues.	
13:00 – 13:50	1. The Business Case for Biodiversity Stewardship (**Mandy Driver**, SANBI and **Kevin McCann**, Wildlands Conservation Trust) 2. Reflecting on the history of the Mpumalanga Protected Area Expansion Strategy: lessons learnt and revising the spatial assessment (**Brian Morris** and Mervyn Lötter, MTPA) 3. One approach to generating wilderness zones in protected areas (Ian Rushworth, Sonja Krüger and **Boyd Escott**, Ezemvelo KZN Wildlife) 4. HELP WANTED: in meeting our protected area targets (**Kerry Maree**, Genevieve Pence and Kerry Purnell, CapeNature) 5. Supporting biodiversity planning with sustainable financing strategies: our best planning can come to naught if provincial agencies can't fund the implementation of biodiversity plans (**Andrew Purnell,** NCC Environmental Services)
13:50 – 14:00	SHORT BREAK
14:00 – 15:30	6. Expansion of the protected area in the declared Karoo Central Astronomy Advantage Area (Square Kilometer Array) in Carnarvon, Northern Cape (**Thivhulawi Nethononda**, DEA) 7. Unlocking obstacles in the Phakisa expansion of South Africa's Marine Protected Areas (**Tsamaelo Malebu**, **Siyasanga Miza** and Kerry Sink, SANBI) 8. National Protected Area Expansion Strategy: how should we build a national PAES from the bottom up? (**Stephen Holness** and **Andrew Skowno**, ECOSOL GIS)
15:30 – 16:00	TEA

Session descriptions and presentations: Wednesday 24 June 2015	
Afternoon parallel sessions (16:00 – 17:30)	
Parallel session 1: SPLUMA National Land Use Classification	
Venue: Marlin Room	
Facilitator: Anthea Stephens	
Description	
The Spatial Planning and Land Use Management Act (No 16 of 2013) (SPLUMA) will be implemented from the 1st of July 2015. One of the tools which are being developed to aid in its implementation is the National Land Use Classification System (NLUC), which seeks to standardise land use categories for the entire country. Some initial thinking has been done about the conservation-related land use categories and the aim of this session is for the biodiversity planning community to discuss which of these categories should be incorporated into the NLUC.	
16:00 – 17:30	1. Brief background to SPLUMA and the proposed conservation related land use classes (**Sagwata Manyike**, SANBI) 2. Incorporation of biodiversity information into the municipal land use schemes (**Felicity Elliott** and Boyd Escott, Ezemvelo KZN Wildlife) 3. Inputs highlighting experiences from other provinces e.g. Western Cape Presentations to be followed by discussion on the proposed conservation-related land use classes.
17:30 – 19:00	Networking opportunity and informal discussions
19:00	DINNER
Parallel session 2: Guidelines for invasive species management plans	
Venue: Royal Palm Room	
Facilitators: Philip Ivey and Alex Marsh	
Description	
In accordance with the Invasive Species Regulations published in terms of the Biodiversity Act the Minister must develop guidelines for the development of monitoring, control and eradication plans for listed invasive species. These guidelines are currently being developed through the Environmental Programmes Branch of DEA. This session will discuss how the guidelines being developed for the invasive species monitoring, control and eradication plans need to speak to biodiversity plans and other land use planning tools and frameworks. The session will include discussion on how eradication plans should be informed by Critical Biodiversity Areas and the level of integration required between biodiversity plans and eradication plans.	
16:00 – 17:30	Workshop on the development of guidelines for invasive species management plans
17:30 – 19:00	Networking opportunity and informal discussions
19:00	DINNER

Session descriptions and presentations: Thursday 25 June 2015
Morning sessions (08:30 – 13:00)
Plenary session: Ecosystem classification and mapping

Venue: Marlin Room

Facilitator: Fahiema Daniels

Description

The National Biodiversity Assessment (NBA) 2018, which follows the NBA 2011 and the National Spatial Biodiversity Assessment (NSBA) 2004, is currently underway. NBA 2011 identified strengthening and formalizing the National Ecosystem Classification System as a priority. This session will look at various aspects of ecosystem classification in the different environments. Included in this session will be an open discussion on the National Vegetation Map to raise issues and ideas to improve and strengthen the quality of the product for users and as an input layer in the NBA 2018.

08:30 – 10:30	1. Overview of session and progress with the National Ecosystem Classification System (**Andrew Skowno,** SANBI)
	2. National Vegetation Map of South Africa, Lesotho and Swaziland: building the map for 2017 (open discussion) (**Anisha Dayaram**, **Andrew Skowno** and **Les Powrie,** SANBI)
	3. Distribution of wetland vegetation types, their conservation importance and their ecological drivers in South Africa (**Erwin Sieben** and Hlengiwe Mtshali, University of Free State and Matthew Janks, Rhodes University)
	4. Refinement of spatial data on wetlands for the Mpumalanga Highveld region (**Namhla Mbona**, SANBI)
	5. Progress in marine ecosystem classification, mapping and targets: testing the boundaries (**Kerry Sink**, SANBI and Natasha Karenyi, SANBI and University of Cape Town)
	6. Identifying micro-estuaries within KwaZulu-Natal Province, South Africa (**Ayanda Mnikathi** and Boyd Escott, Ezemvelo KZN Wildlife and Azrah Essop, Gauteng Department of Agriculture and Rural Development)
10:30 – 11:00	TEA

Plenary session: Assessing and mapping ecological condition

Venue: Marlin Room

Facilitator: Mandy Driver

Description

Spatial data on ecological condition is fundamental to biodiversity assessment and planning. To date, the assessment of ecological condition has been approached differently in different realms. The aim of this session is two-fold:

- to share information about approaches and methods used to date in the different realms (terrestrial, freshwater, estuarine, coastal and marine), and to explore whether there are lessons that could be shared across realms
- to discuss a proposed set of ecological condition categories and definitions, and to explore the potential for consistency across realms in this regard

Session descriptions and presentations: Thursday 25 June 2015
Morning sessions (08:30 – 13:00)
Plenary session: Assessing and mapping ecological condition

11:00 – 13:00	1. Session introduction and proposed ecological condition classes (**Mandy Driver**, SANBI) 2. Overview of the Department of Water and Sanitation's system of Present Ecological State categories for **rivers** (**Mandy Driver**, SANBI) 3. River disturbance index as an approach to assessing and predicting ecological condition of **rivers** (**Boyd Escott**, Ezemvelo KZN Wildlife) 4. Approaches and methods for assessing ecological condition of **wetlands** (**Heidi van Deventer**, CSIR) 5. Mapping ecological condition in the **marine** environment using pressures and habitat-specific impacts (**Kerry Sink**, SANBI) 6. Mapping degradation in the **terrestrial** environment: methodology and results from the LADA (Land Degradation Assessment in Drylands) National Assessment for South Africa (**Lehman Lindeque**, DAFF) 7. What is 'natural': mapping ecological condition in the **terrestrial** environment and possible approaches for a terrestrial ecosystem condition assessment in the NBA (**Andrew Skowno**, SANBI)
13:00 – 14:00	LUNCH

Afternoon parallel sessions (14:00 – 15:30)
Parallel session 1: Maximising the application value of the National Land Cover 2013/14 (NLC 2013/14) data
Venue: Marlin Room
Facilitator: Stuart Martin
Description
Land cover data is a crucial reference dataset that informs a wide variety of activities ranging from environmental planning and protection, development planning, economic development, compliance monitoring and enforcement. The workshop will provide an overview of the NLC 2013/14 data products as well as focus on the potential of the dataset in providing information in support of decision-making.

14:00 – 15:30	Workshop on maximizing the application value of the NLC 2013/14 (**Stuart Martin**, GeoTerra Image (Pty) Ltd)
15:30 – 16:00	TEA

Session descriptions and presentations: Thursday 25 June 2015
Afternoon parallel sessions (14:00 – 15:30)
Parallel session 2: Strengthening the science-policy interface for effective planning: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
Venue: Royal Palm Room
Facilitators: Carmel Mbizvo, Luthando Dziba and Kiruben Naicker
Description
IPBES was established in April 2012, as an independent intergovernmental body open to all member countries of the United Nations with the overall objective to provide policy relevant knowledge on biodiversity and ecosystem services to inform decision making. IPBES provides a conceptual framework recognized by both the scientific and policy communities to synthesize, review, assess and critically evaluate relevant information and knowledge generated worldwide by governments, academia, scientific organizations, non-governmental organizations and indigenous communities. This session will provide an overview of IPBES and discuss the IPBES Capacity Building Programme and the Africa Regional Assessment Process and Knowledge, Information and Data Strategy and Action Plan.

14:00 – 15:30	Workshop on strengthening the science-policy interface for effective planning
15:30 – 16:00	TEA

Afternoon parallel sessions (16:00 – 17:30)
Parallel session 1: Maximising the application value of the National Land Cover 2013/14 (NLC 2013/14) data (session continued)
Venue: Marlin Room
Facilitator: Stuart Martin
Description
This session is a continuation of the previous session (see description above).

16:00 – 17:30	Workshop on maximizing the application value of the NLC 2013/14 (**Stuart Martin**, GeoTerra Image (Pty) Ltd)

Session descriptions and presentations: Thursday 25 June 2015	
Afternoon parallel sessions (16:00 – 17:30)	
Plenary session 2: Setting targets for species in biodiversity plans	
Venue: Sails Room	
Facilitators: Domitilla Raimondo and Lize von Staden	
Description	
The setting of species targets in biodiversity planning and assessment still lags behind the setting of ecosystem targets. In addition, there is a misalignment in current target-setting practices between species and ecosystems. This workshop will review current methods for species target-setting as well as some key alternative methods from the scientific literature. It will also present, for discussion, a proposed outline of methods for setting species targets.	
16:00 – 17:30	1. Inputs from provinces on how species targets are currently set in biodiversity plans e.g. Free State, KwaZulu-Natal 2. Summary of existing publications that set targets for species in biodiversity plans (**Lize von Staden** and **Domitilla Raimondo**, SANBI) 3. Important challenges to be taken into account and a suggested framework for setting targets for species in South Africa (**Lize von Staden, Domitilla Raimondo** and **Dewidine von der Colff**, SANBI) Discussion on suggested framework
Plenary session 3: Strengthening the science-policy interface for effective planning: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) (session continued)	
Venue: Royal Palm Room	
Facilitators: Carmel Mbizvo, Luthando Dziba and Kiruben Naicker	
Description	
This will be a continuation of the previous session (see details above).	
16:00 – 17:30	Workshop on strengthening the science-policy interface for effective planning
Evening discussion	
Venue: To be confirmed	
Facilitators: Philip Desmet and Nicolene Fourie	
17:30 – 19:00	Brainstorming on novel datasets for biodiversity planning
19:00	DINNER

Session descriptions and presentations: Friday 26 June 2015
Morning parallel sessions (08:30 – 10:30)
Parallel session 1: Implementing biodiversity plans: case studies, lessons and challenges

Venue: Marlin Room

Facilitator: Budu Manaka

Description

This session includes submitted presentations that focus on the implementation of biodiversity plans and will highlight some of the opportunities created and the challenges experienced. The session will provide a platform to discuss issues raised and generate user feedback for biodiversity planners and implementers to consider as they develop strategies to implement biodiversity plans further.

08:30 – 10:30	1. Developing products to support implementation of Mpumalanga Biodiversity Sector Plan and bioregional plans within Mpumalanga (**Mervyn Lötter**, MTPA)
	2. Progress with the Waterberg District Municipality Bioregional Plan and lessons learnt (**Philip Desmet**, ECOSOL GIS)
	3. The Ekurhuleni Metropolitan Municipality (EMM) experience on the compilation of the bioregional plan and the mainstreaming thereof in the Spatial Development Frameworks (SDFs) (**Elsabeth van der Merwe**, Ekurhuleni Metropolitan Municipality)
	4. Update on planning and implementation in the City of Cape Town (**Julia Wood**, Pat Holmes and Cliff Dorse, City of Cape Town)
	5. Incorporating the Garden Route Biodiversity Sector Plan 2010 into the Knysna Municipality Integrated SDF 2015 (**Maretha Alant** and Johan Baard, SANParks)
	6. Evaluating the impact of CBA maps (**Sam Lloyd**, Imperial College London)
10:30 – 11:00	TEA
Parallel session 2: Identifying priority ecological infrastructure in the uMngeni River catchment	

Venue: Royal Palm Room

Facilitators: Pearl Gola, Gary de Winnaar and John Dini

Description

Through funding from the Green Fund, the University of KwaZulu-Natal, in partnership with the South African National Biodiversity Institute (SANBI), is undertaking a project to assess whether the challenge of sustaining good quality water delivery in the uMngeni River catchment can be achieved through investment in ecological infrastructure. The initial results from the mapping and modelling completed for the upper uMngeni to date will be presented at this workshop, together with proposed methods for prioritising key ecological infrastructure, for further discussion.

08:30 – 10:30	Workshop on identifying priority ecological infrastructure in the uMngeni River catchment
10:30 – 11:00	TEA

Session descriptions and presentations: Friday 26 June 2015
Late morning parallel sessions (11:00 – 12:30)
Parallel session 1: Implementing biodiversity plans and accessing biodiversity data

Venue: Marlin Room

Facilitator: Jeffery Manuel

Description

This session includes submitted presentations that focus on the implementation of biodiversity plans and will highlight some of the opportunities created and the challenges experienced. The session will also focus on accessing biodiversity data and will provide an opportunity for participants to feedback and provide suggestions on BGIS in order to help guide the planned infrastructure development.

11:00 – 12:30	1. Implementation of Critical Biodiversity Areas in the landscape: beyond legislated protected areas (**Rhett Smart**, CapeNature) 2. Biodiversity offset implementation in the Western Cape: policy vs practice (**Alana Duffell-Canham**, CapeNature) 3. Sub-national implementation: a tale of four cities (**Russell Galt**, SANBI) 4. Accessing biodiversity data (**Fhatani Ranwashe**, SANBI) 5. BGIS: the road ahead (**Sediqa Khatieb**, SANBI)

Parallel session 2: Innovative approaches and methodologies

Venue: Royal Palm Room

Facilitator: Kagiso Mangwale

Description

This session includes a series of submitted presentations dealing with technical issues related to approaches and methods for biodiversity assessment and planning.

11:00 – 12:30	1. The role of resource directed measures in biodiversity conservation (**Catherine Pringle**, Institute of Natural Resources) 2. Systematic land-cover change in KwaZulu-Natal, South Africa (**Debbie Jewitt**, Ezemvelo KZN Wildlife; Peter Goodman; Barend Erasmus, Wits University; Tim O'Connor, SAEON and Ed Witkowski, Wits University) 3. The 2014 North West Biodiversity Sector Plan (**Ray Schaller**, North West Department of Rural, Environment and Agricultural Development and Phillip Desmet, ECOSOL GIS) 4. Challenges incorporating new land-use practices in the wildlife industry into biodiversity planning processes (**Lizanne Nel**, SA Hunters and Game Conservation Association and Andy Blackmore, Ezemvelo KZN Wildlife) 5. National Red Listing and spatial data: an untapped frontier to estimate extinction risk (Matthew Child and **Harriet Davies-Mostert**, Endangered Wildlife Trust; and Domitilla Raimondo, SANBI) 6. The value of marine spatial planning to assist in the development of biodiversity management plans for marine ecosystems (**Millicent Makoala** and Zintle Mapekula, DEA O&C)

Session descriptions and presentations: Friday 26 June 2015	
Close of Forum	
12:30 – 13:00	Evaluation, thanks and close of 2015 Forum, Jeffery Manuel and Tammy Smith (SANBI)
13:00	LUNCH

Keynote addresses

Five Futures: interpreting the IPCC scenarios in a local context

R.J. (Bob) Scholes
Global Change and Sustainability Research Institute, University of the Witwatersrand; bob.scholes@wits.ac.za

Planning over timeframes of decades to centuries requires a view on how the future may evolve. Since this is unpredictable beyond a few years, the technique of generating plausible and internally-coherent scenarios is used. Scenarios developed for different purposes usually share an underlying core of shared assumptions around population, politics and economy. As a result, it is often possible to identify scenario 'archetypes'. This makes it possible to borrow the scenario work done for one purpose (e.g. climate projection) and adapt it for another (e.g. biodiversity planning). The Intergovernmental Panel on Climate Change has conducted a state-of-the-art global scenario exercise over the past several years. The scenario narratives and the detailed modelled datasets on issues including population, economics, climate, technology and land use that flow from them, are about to be published. The five IPCC scenarios will be presented, and interpreted through a biodiversity impact lens.

A second technical challenge in the scenarios business is to 'scale' scenarios between global and local. The IPCC scenarios were constructed by making shared assumptions at global scale (as informed by the narratives), modelling GDP, population and technology individually for every country in the world and then summing the results up to global scale. It is useful to perform downscaling as well: given these global and regional assumptions, how might they interact with trends and policies at national scale?

The Phakisa MPA journey: 21 new Marine Protected Areas on the map!

Kerry Sink
South African National Biodiversity Institute (SANBI); k.sink@sanbi.org.za

Phakisa is a Sesotho word meaning "accelerate" or "hurry up". Operation Phakisa is a Presidential Initiative to unlock South Africa's Ocean Economy. The initiative aims to fast track economic development particularly in the oil and gas, maritime manufacturing, and aquaculture sectors but this is enabled through projects to strengthen ocean governance, planning and protection. This presentation provides an overview of the high speed journey of the Marine Protected Area (MPA) Initiative, one of ten projects developed by the Marine Protection Services and Governance Lab of Operation Phakisa. This initiative seeks to expand South Africa's mainland MPA estate from the current 0.4% of our marine territory to at least 5% through the proclamation of 21 new MPAs. The presentation is a reflection of the six week intensive lab process, the ten years of work, the ten systematic marine biodiversity plans and assessments that underlie the proposed network, and the ten months following the lab. An overview of the lab methodology is shared and key enabling factors, main challenges and some critical success factors are distilled to support application of this approach in other biodiversity sector work. The main objectives of the network are showcased through an introduction to a few of the iconic new proposed MPAs. Looking ahead, key steps in the realisation of the significant opportunities provided by this unique initiative are emphasised.

Plenary session: National highlights, new projects and updates

Biodiversity planning highlights 2014-15

Tsamaelo Malebu
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Each year we highlight the biodiversity planning achievements across the country over the past year, together with related policy processes. This presentation will showcase some of the successes over the year and indicate where additional presentations and further discussions on these highlights will happen in the programme over the course of the week.

National Biodiversity Assessment 2018

Andrew Skowno
South African National Biodiversity Institute (SANBI);
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The National Biodiversity Assessment is becoming a familiar milestone for South Africa's biodiversity planning community. The third NBA, which is now underway, is scheduled to be completed in 2018 and builds on the content and approach of the 2004 and 2011 editions. The story of the NBA is very closely linked to the Biodiversity Planning Forum - it's been a standing program item since 2004. The flow of ideas from the broad Biodiversity Planning Forum into the NBA, and *vice versa* is a real biodiversity success story.

For the first time SANBI has a dedicated team consisting of a Lead Scientist, Project Coordinator and Junior Scientist to implement the NBA

2018; but work of this nature will always be a collaborative effort, relying on expertise and contributions from many sectors and institutions.

The governance structures and time frames for the NBA will be presented and discussed, followed by a brief overview of some of the envisaged content and proposed new analyses and ideas.

Building biodiversity data infrastructures for science and decision-making

Brenda Daly
South African National Biodiversity Institute (SANBI); b.daly@sanbi.org.za

The South African National Biodiversity Institute's (SANBI's) legal mandate includes the requirements to proactively harness, organise, refine, synthesise and manage biodiversity information and knowledge. SANBI performs this function not only with the information and knowledge generated within the Institute but also from its partner organisations. The information is critical to inform science-based policy development as well as to support responsible and accountable land-use planning and decision-making practices.

While data quality impedes use, infrastructure shortcomings, capacity limitations and project sustainability often represent barriers for making data openly accessible. A detailed stakeholder engagement process to initiate the process of working with partners to develop a shared vision and framework was undertaken – and included an international Architecture Workshop in 2013, numerous internal SANBI workshops and discussions, and a Biodiversity Information Management Forum (BIMF) in 2013. Following this process SANBI is implementing an integrated biodiversity information system so as to achieve SANBI's strategic targets. The envisaged outcome is an integrated national biodiversity information system that builds on established protocols and services to enable pervasive access to, and coordinated sharing of, biodiversity data.

The presentation will provide an overview of SANBI's data infrastructures (historical and recent core investments) and SANBI's 2-year data infrastructure horizon.

National Land Cover 2013/14 (NLC 2013/14) to inform DEA's operational requirements

Nicolene Fourie

Enterprise Geospatial Information Management (EGIM), Department of Environmental Affairs (DEA); nfourie@environment.gov.za

The Department of Environmental Affairs (DEA) has an array of legislation that governs its strategic direction and the associated operational activities. Access to and the use of current and historical land cover and land use data and information products is crucial for the execution of DEA's legislation mandate. This mandate is complex in as much as it transcends the different spheres of contentment and has an impact on the private sector activities.

The presentation will define the concept of land cover and land use data and provide an overview of DEA's environmental legislative requirements for the data. An introduction to the NLC 2013/14 dataset project will be given and the associated project deliverables will be unpacked with specific focus on the value that external users can derive from the project. In conclusion examples will be provided of the DEA's applications of the NLC 2013/14 dataset in its strategic and operational activities.

SANBI's Invasive Species Programme: taking the NEMBA regulations forward

Philip Ivey[1], Sabrina Kumschick[1,2], Phetole Manyama[1], Alex Marsh[1], Ingrid Nänni[1] and John Wilson[1,2]

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South Africa's rich biodiversity and ecological infrastructure are threatened by invasive species. To address this threat and ensure compliance with the Biodiversity Act and the new invasive species regulations, SANBI's Invasive Species Programme works with stakeholders in three key areas: 1) risk assessment; 2) development and implementation of management strategies for particular taxa; and 3) assistance with the development of management plans.

SANBI and partners collect and collate data for risk assessments that ensure scientifically robust decisions. A large part of SANBI's mandate is to detect new invasions, evaluate their risk and plan for eradication or management of the species. The Act requires that the minister ensure co-ordination of management programmes for invasive species. We are developing management strategies for all eradication targets and are involved with the development of strategies for other species.

All organs of state are required to prepare invasive species monitoring, control and eradication plans for land under their control. We are working with SANBI botanical gardens to develop their plans and are contributing to the dialogue around this with other organs of state. It is still not clear which entity will assist municipalities, but guidelines for management plans are being developed to simplify this task.

Introduction to ecosystem accounting

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National accounting measures how much is produced, consumed and invested in the economy. Its headline indicator, Gross Domestic Product (GDP), has widely recognised limitations, including that it measures only what is transacted in markets, and ignores social costs, environmental impacts and income inequality. Ecosystem accounting is a relatively new tool developed to address some of these limitations, through the systematic measurement of ecosystem assets, and the flows of services from ecosystems into economic and other human activity.

SANBI and Statistics South Africa (StatsSA) are pursuing a programme of work in ecosystem accounting, in partnership with the CSIR, Department of Water and Sanitation, Department of Environmental Affairs, Ezemvelo KZN Wildlife and others. This work feeds into a global project on Advancing Experimental Ecosystem Accounting, led by the United Nations Statistics Division (UNSD), in which South Africa is one of seven pilot countries.

Ecosystem accounting does not necessarily imply accounting for ecosystems in monetary terms, and need not involve valuation of ecosystems. In South Africa we are approaching ecosystem accounting from the point of view of physical accounting, drawing on the scientific building blocks that form the foundation of the National Biodiversity Assessment and translating these into an accounting framework, thereby generating information that can be used in a wider range of socio-economic contexts.

This presentation introduces key concepts in ecosystem accounting, highlighting their links with spatial biodiversity assessment and planning, and outlines South Africa's work in this exciting new field.

Abstracts: Wednesday 24 June
Plenary session: Protected area expansion

The Business Case for Biodiversity Stewardship

Mandy Driver[1] and Kevin McCann[2]

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The Business Case for Biodiversity Stewardship has been developed by the South African National Biodiversity Institute (SANBI) for the Department of Environmental Affairs (DEA). The focus of the report is on biodiversity stewardship as one key aspect of South Africa's biodiversity conservation effort, with the aim of making the case for increasing sustained investment in the biodiversity stewardship programmes in South Africa. The report also provides an overview of biodiversity stewardship in South Africa and provides a list of recommendations in order to maximise the potential of biodiversity stewardship.

Reflecting on the history of the Mpumalanga Protected Area Expansion Strategy: lessons learned and revising the spatial assessment

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Mpumalanga's Protected Area Expansion Strategy (MPAES) was developed in 2009. A biodiversity stewardship unit was established in the same year within the MTPA. Through collaboration with SANBI, WWF-SA, Birdlife-SA and the EWT, the province has made significant progress to expand the protected area system within the province. The grassland biome has been the area of focus for protected areas expansion over the last five years. From 2009 to date a total of 102 069 hectares have been added to the protected area system through the biodiversity stewardship programme. The MTPA is currently reviewing the provincial protected areas expansion strategy. The spatial priorities for protected areas expansion will also be reviewed and a slightly different approach implemented to that used in the 2009 MPAES. Key input layers will include wilderness zones, climate change priorities, Critical Biodiversity Areas, plant species not included under any existing protected area network, and hotspots for species of conservation concern. Given the current political framework within Mpumalanga, we exclude priority mining areas from our short term priorities to ensure we are able to meet targets.

One approach to generating wilderness zones within protected areas

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The mapping of a Wilderness Zonation within a protected area is based on the Recreational Opportunity Spectrum Zonation System where seven zones are allocated according to their proximity to and impact of external human disturbances. A practical, reproducible and objective method used to map Wilderness Zonation using Digital Terrain Models, point source data and remote sensing information to create an index of perceived impact using the UKhahlamba Drakensberg Park World Heritage Site (UDP WHS) as a test case will be presented. The index incorporates multiple land-use categories, each of which is subject to independently aligned distance thresholds which consider degrees of associated activity, light, noise and general pollution, as well as the scale of the land-use being considered. The applicability of this approach in informing protected area management plans, their associated buffer zonation's, as well as modelling predicted future impacts based on proposed development applications will be discussed.

HELP WANTED: in meeting our protected area targets

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By 2020, at least 17% of terrestrial and inland water areas and 10% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascape.

Although the semantics game may allow us to escape the gallows, the true intention of this target (i.e. to meaningfully safeguard, in perpetuity, a representative sample (17%) of all biodiversity contained within our custodianship, by the year 2020) remains a distant pipe-dream for the Western Cape Province.

According to our revised Western Cape Protected Area Expansion Strategy, we have already conceded to not meeting this target by 2020 but rather by 2030. Our strategy requires us to triple that achieved over the last five years in the following five years – and then again in the next two five-year cycles thereafter. The confirmed budget in place, however, allows us to deliver one third of what was achieved in the last five years, i.e. 14% of what we need to achieve.

We take an earnest look at how the province can meaningfully deliver on our political commitments and call on the audience to help answer the questions: Who are 'the powers' which require convincing in order to appropriately resource provincial expansion programmes; and how do we convince them?

Supporting biodiversity planning with sustainable financing strategies: our best planning can come to naught if provincial agencies can't fund the implementation of biodiversity plans

Andrew Purnell

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This presentation shares insights and lessons learned from the three year CapeNature project to 'Develop an Investment Business Case of the income generation potential of protected areas in the Western Cape'. The topics covered will include the key elements of the project which include: a) Identifying and prioritising all potential income streams, b) designing sustainable financing projects by linking income streams to specific protected areas, c) identifying and addressing internal skills and resource gaps, d) compiling full business plans and investment strategies for sustainable financing projects, e) supporting the organisation through the implementation of sustainable financing pilot projects.

The linkage between CapeNature's project and other related provincial and national initiatives in South Africa will be summarised. Insights will be shared that have a direct bearing on biodiversity planning. These include: the value of including or acquiring transformed land into the 'conservation estate' for the purpose of developing income generating infrastructure without impacting on core biodiversity areas, and the need for spatial sensitivity mapping that takes into consideration the full scope of potential income generation activities.

Finally the presentation will touch on some of the concerns raised by conservation managers about the negative impacts on biodiversity and ecosystem functioning that can arise from implementing income generating activities inside protected areas and how these risks can be mitigated.

Further insights can be found on the project blog:

http://www.ncc group.co.za/blog/2014/12/capenature project income generation sustainable financing protected areas

Expansion of the protected area in the declared Karoo Central Astronomy Advantage Areas (Square Kilometer Array) in Carnarvon, Northern Cape

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The Department of Environmental Affairs is investigating the possibility of expanding the protected area estate in the Northern Cape Province through the declaration of the Karoo Central Astronomy Advantage Areas as a protected area. The declared Karoo Central Astronomy Advantage Areas covers almost 10.5 million hectares and, if added to the protected area estate, will assist the country and department to fulfil both Outcome 10 targets and the National Protected Areas Expansion targets. The members of the Conservation Initiative Task Team are as follows: DEA, DST, DENC, SANParks, SKA and SANBI.

Unlocking obstacles in the Phakisa expansion of South Africa's Marine Protected Areas

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Initiative Eight of the Marine Protection Services and Governance Lab of Operation Phakisa aimed to create a Representative Marine Protected Area (MPA) Network. Over a six week period, the team collated more than 700 spatial layers to identify 21 new proposed MPAs covering approximately 7% of South Africa's mainland marine territory. Intensive stakeholder dialogue was a key feature during the six week lab process and the following eight months. This presentation uses five case studies to demonstrate key issues raised by stakeholders and the steps taken by the technical team to address these concerns. Challenges included overlap with highly prospective areas within petroleum leases, potential impacts on fishermen, inadequate protection of foraging areas of threatened penguins and turtles, and practical compliance and enforcement concerns. These were addressed through spatial analysis to improve the understanding of potential impacts on stakeholders, design adjustments and boundary revision informed by new information (where possible), and zonation of activities compatible with protection goals. Further challenges are anticipated and our experiences suggest that these are best addressed through continued meaningful stakeholder dialogue, the collection and application of science based advice and new innovations in marine spatial planning.

National Protected Area Expansion Strategy: how should we build a national PAES from the bottom up?

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Purpose of the session
The spatial planning for the previous National Protected Area Expansion Strategy 2008 was very much a top down process: at that time few provinces had a defined PAES or an established set of spatial priorities. However, we are now in the position where we have robust systematic assessments of spatial priorities for protected area expansion for many provinces (e.g. the Western Cape and Mpumalanga PAES presented as the lead into this session), as well as for marine environments, rivers and estuaries.

We are now busy with a National Protected Area Expansion Strategy 2015, and want to build the spatial priorities of this PAES up from the existing provincial and other priorities. However, this is not an easy task and there are many ways of dealing with issues. The NPAES team would like to facilitate an open discussion with all the provincial conservation planners, as well as the marine, estuarine and freshwater stakeholders in order to identify an appropriate approach to dealing with spatial issues in

the NPAES revision. This will also serve to strengthen the spatial components of the NPAES 2015 and ensure that provincial and other priorities are appropriately built into the national product.

Session outline

Introductions will be followed by a brief presentation outlining the update process for the National Protected Area Expansion Strategy 2015; the current suggested integration process for the PAES, and an outline of some of the initial key issues. Participants will have the opportunity to raise additional issues. Our anticipated themes include:

- How should we deal with areas where we don't have defined provincial spatial priorities;
- What happens where provincial priorities don't fully meet targets?
- What happens where various nationally identified priority areas (e.g. FEPA and priority estuaries) are not fully incorporated into provincial priorities?
- How should we align marine, estuarine and terrestrial priority areas?

Additional themes will evolve as the discussion progresses.

Anticipated outcomes

- Agreement on way forward for incorporating provincial and other spatial priorities (including marine, estuarine and freshwater) into the revised NPAES.
- Agreement on an initial approach to dealing with gaps, overlaps and alignment issues.

Parallel session: SPLUMA National Land Use Classification

Brief background to SPLUMA and the proposed conservation related land use classes

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The Spatial Planning and Land Use Management Act (No 16 of 2013) (SPLUMA) will be implemented from 1 July 2015. One of the tools which are being developed to aid in its implementation is the National Land Use Classification System (NLUC), which seeks to standardise land use categories for the entire country. These categories will then inform Land Use Schemes (zoning) and Spatial Development Frameworks. All municipalities are required to have a SPLUMA compliant Land Use Scheme within 5 years of the commencement of SPLUMA. Finalising conservation-related land use classes is difficult because biodiversity importance does not necessarily relate to a specific land use. SANBI, along with a few conservation agencies, have carried out some initial consideration on conservation-related land use classes. The aim of this session is for the biodiversity planning community to discuss which conservation-related land use categories should be incorporated into the NLUC. This session will begin with a brief background on SPLUMA and then proceed to explain some of the tools which have been developed to aid in its implementation. These tools include the Spatial Development Framework Guidelines, the Land Use Scheme Guidelines and the National Spatial Development Framework. The session will close with a discussion on the proposed conservation-related land use classes.

Incorporation of biodiversity information into the municipal land use schemes

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The Spatial Planning and Land Use Management Act (SPLUMA), which will commence on 1 July 2015, requires that land use schemes are extended over all land under municipalities by the year 2020. This means that such land use schemes will eventually be extended over what is currently considered as 'rural areas', namely the Act 70 of 70 agricultural and traditional areas. Many KZN municipalities during 2014/2015 have commenced with the development of these wall to wall schemes, which required input from Ezemvelo KZN Wildlife on the incorporation of biodiversity and the KZN Biodiversity Plan. Here we present the approach followed within KZN with regards to getting the Critical Biodiversity Areas and Ecological Support Areas into the wall to wall land use schemes.

Parallel session: Guidelines for invasive species management plans

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In accordance with the Invasive Species Regulations published in terms of the Biodiversity Act the Minister must:

(1)(a) develop guidelines for the development of Invasive Species Monitoring, Control and Eradication Plans for listed invasive species as contemplated in section 76;

(b) publish the guidelines contemplated in paragraph (a) on its website; and;

(c) review, at least every five years and, if necessary, amend the guidelines contemplated in paragraph (a).

(2) Management authorities of protected areas and organs of state in all spheres of government must submit their Invasive Species Monitoring, Control and Eradication Plans contemplated in section 76 of the Act and based on priorities identified through the guidelines to the Minister and to the Institute within one year of the publication of the guidelines contemplated in sub-regulation (1)".

These guidelines are currently being developed through the Environmental Programmes Branch at DEA. In accordance with law, they need to be finalised by October 2015, and implemented a year from then. At the 2014 Biodiversity Planning Forum a session was held to gather inputs on what needs to appear in the National Status Report, which will draw strongly from all eradication plans. This feedback has been sent through to the relevant consultant who is incorporating the feedback into the guidelines.

This session will discuss how the guidelines being developed for the Invasive Species Monitoring, Control and Eradication Plans need to speak to biodiversity plans and other land use planning tools and frameworks e.g. SDFs, IDPs, and the Spatial Development Frameworks arising from the Spatial Planning and Land Use Management Act that comes into effect on July 1 2015. Items for discussion include:

- How should the eradication plans be informed by Critical Biodiversity Areas?
- What level of integration is possible between biodiversity plans and eradication plans?
- What data exists that should inform the guidelines?

Discussions from the workshop will be channelled to those putting together the guidelines to ensure alignment.

Strategic management of cactus invasions in South Africa

Haylee Kaplan[1], Ana Novoa[2], Hildegard Klein[3], John Wilson[1,2], Lesley Henderson[3], Helmuth Zimmerman[4], Philip Ivey[1] and Brian van Wilgen[2]

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Cactus species are among South Africa's most widespread and damaging invaders. The 34 species known to be invasive in the region cause considerable economic, social and ecological impacts. Successful management of cactus invasions requires an integrated approach based on prevention, early detection and control. However, there are three major issues that need to be addressed in South Africa to overcome the unique management challenges which cacti pose. Firstly, some invasive cactus species are valued and much-utilized as commercial crops and ornamentals. This leads to conflicts of interest and if left unregulated can undermine management efforts. Secondly, cactus invasions are often difficult to control as there is no history of control on which to base best practice. Lastly, limited resources and a lack of strategic prioritisation has led to poor allocation of management efforts. In response to these and other issues, a national cactus working group was formed in 2012,

comprising all major stakeholders directly involved in cactus management and policy. A national strategy for managing cacti was developed by the cactus working group, in collaboration with external stakeholders such as cactus growers and horticulturists. The aim of this strategy is to reduce the negative impacts of invasive cactus species to a level where the benefits of having cacti in the country outweigh the losses. The three key strategic objectives are outlined and the future of cactus management in South Africa is discussed.

Initial efforts to developing national eradication plans for *Cytisus scoparius* (L.) Link *and Ulex europaeus* (L.)

Kanyisa Jama[1], Philani Mbatha[1], Syd Ramdhani[1], Sershen Naidoo[1] and John Wilson [1,2]

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Cytisus scoparius and *Ulex europaeus* are perennial leguminous shrubs native to Europe. The species were introduced to many countries, where they are now considered as serious weeds. In South Africa, *Cytisus scoparius* and *Ulex europaeus* are restricted to a few localities in KwaZulu-Natal and Eastern Cape. They are listed as category 1a on the NEMBA regulations, meaning an eradication plan needs to be developed and implemented. A study was initiated to investigate the invasiveness of *Cytisus scoparius* and *Ulex europaeus* in South Africa to guide the development of the eradication plan. Preliminary results from the study show that both species seem to have the potential to become invasive in South Africa if not controlled. The study has provided information on areas suitable for invasion and management options that will form the basis for future surveillance activities. Clearing operations will be implemented soon, and a long term management and monitoring plan is being developed concurrently.

Abstracts: Thursday 25 June 2015
Plenary: Ecosystem classification and mapping

National Vegetation Map of South Africa, Lesotho and Swaziland: building the map for 2017 (open discussion)

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The Vegetation Map team at SANBI would like to facilitate an open discussion with stakeholders that interact with the Vegetation Map in order to table potential issues and collate opinions and ideas which may further improve the quality and usability of the product. This will also serve to strengthen the quality of the Vegetation Map as an input into the National Biodiversity Assessment 2017/2018. Points raised during this open session will be tabled and discussed at the upcoming National Vegetation Map committee meeting in September/October 2015.

Introductions will be followed by a brief presentation outlining the purpose of the Vegetation Map of South Africa; the current process of submitting proposed changes to the map; the latest update (2012); and the current structure of the National Vegetation Map Committee. The broad themes for the open discussion session will then be presented. The themes include:
- The next version of VegMap (2016/2017);
- The Vegetation Map and land cover change;
- The subject of wetlands and forests within the Vegetation Map;
- The process for submitting proposed changes;
- The National Vegetation Map Committee.

Themes will evolve as the discussion progresses.

Anticipated outcomes
- Receive feedback on the current state of the Vegetation Map itself (e.g. identifying gaps) and appropriate ideas for future updates.
- Receive feedback about the current procedure for submitting changes to the Vegetation Map and use this feedback to improve the submission process.
- Include points raised by stakeholders in the agenda of the next National Vegetation Map Committee meeting in October 2015.
- Compile a candidate list for additional members to the current National Vegetation Map Committee.
- Continue and enhance collaboration within the Vegetation Map community.

Distribution of wetland vegetation types, their conservation importance and their ecological drivers in South Africa

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Wetlands are recognized as delivering important ecosystem services especially in the light of an impending water crisis in the country. For this reason, wetlands have played an important role in strategic conservation planning for the purpose of water resource management, but they also play an important role as habitats for biodiversity. The plants that make up the various vegetation types in wetlands form important components of this biodiversity and an overview of plant community composition and the physical environment of wetlands is a useful tool in the management of wetlands for biodiversity. For this reason, a database was set up with wetland vegetation data compiled from various historical studies and supplemented with additional fieldwork.

The final database that has emerged from this effort has a total of 5583 vegetation plots and is still growing. This dataset has been classified into 244 plant community types each of which can be recognized by a specific combination of indicator species and widespread species. Ordination diagrams produced by Canonical Correspondence Analysis outline the most important environmental factors that drive wetland community composition. The most species-rich wetland communities are found in the high mountains, the mistbelt region of KwaZulu-Natal and the renosterveld in the Western Cape. Some areas are very rich in community types, among them the Western Cape and Maputaland stand out.

Refinement of spatial data on wetlands for the Mpumalanga Highveld region

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Much funding and specialist time has already been invested by WRC, CSIR, DWA and SANBI in the collaboration that generated the Atlas of Freshwater Ecosystem Protected Areas in South Africa: maps to support sustainable development of water resources, and its supporting technical and implementation manuals. The National Freshwater Ecosystem Protected Areas (NFEPA) project was a tremendous step forward in consolidating existing knowledge and generating new knowledge on the distribution, type and condition of freshwater ecosystems. However, experience in using the maps has shown that there is room to improve the underlying data (particularly the wetland layers) used to identify the Freshwater Ecosystem Priority Areas (FEPAs). This has implications for the confidence that can be attached to the information on ecosystem typing, condition and threat status generated by the project. The NFEPA project team acknowledged that, being of a national scale, the datasets would not be completely accurate at fine scale and that there was an ongoing need to refine these datasets over time, using more localized approaches.

The Mpumalanga Highveld region of South Africa contains one of the highest concentrations of FEPAs in the country. The unique grassland and wetland association within the area is host to numerous threatened and conservation-worthy species and ecosystems. The area is also the source of several of the country's major rivers, which collectively contribute 26% of South Africa's natural mean annual runoff and 28% of its available water yield. Beneath the surface, the Mpumalanga Highveld straddles coalfields that are estimated to collectively contain 51% of national recoverable coal reserves.

Under the WRC, a project was initiated to groundtruth and refine the current data layers of the extent, distribution, condition and type of wetlands ecosystems in the Mpumalanga Highveld coal belt. This talk will discuss tools and the methods used for the groundtruthing process. It will also showcase the improved data products and some of the statistics arising from this work.

Progress in marine ecosystem classification, mapping and targets: testing the boundaries

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This presentation summarises the approach taken in the mapping and classification of marine ecosystems in South Africa and the first work in setting quantitative biodiversity targets for unconsolidated marine ecosystem types. The inaccessible, three dimensional, dynamic ocean environment poses many challenges which have been addressed through a range of approaches including biophysical seascape and biotope classifications, research to understand marine biodiversity surrogates, citizen science to map reefs and the use of species area curves to develop the first local biodiversity targets. The data-informed, expert-derived classification and map used in 2011 was reasonably well supported since fish, macrofauna and eipfauna data showed support for the divisions

involved and yielded better results than a purely physical data based approach. Progress since 2012 is reviewed and proposed methods, data sources and research opportunities to advance this work are identified. These include new approaches in habitat mapping, testing surrogacy through collaborative research cruises, co-operative work with offshore industries, and inclusion of data from the fisheries and petroleum government agencies. Priority habitat types for further work are discussed.

Identifying micro-estuaries within KwaZulu-Natal province, South Africa

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The mapping of estuaries in South Africa over the last 50 years has been largely neglected. The first attempts at moving beyond point localities at a local or provincial level within KwaZulu-Natal were in 2007. This was only completed nationally in 2011 with the release of the National Biodiversity Assessment. These various mapping scales, each using different reference datasets, have resulted in the adoption of different mapping methodologies. In 2013, Ezemvelo KZN Wildlife, with support from the KwaZulu-Natal estuarine community, initiated a programme to create a standardised reference dataset. This will reflect all estuarine types, updated names or historic vegetation extent, and previously unmapped micro-estuaries. The micro-estuaries were initially sited using GPS points; the 5m contour was used as the landward boundary and the Ezemvelo developed high tide line as the seaward boundary. Of the 189 mapped estuaries, 48 were tentatively identified as micro-estuaries following a groundtruthing exercise that referenced a pre-determined set of classification criteria. This is an on-going project and the criteria still have to be finalised.

Plenary session: Assessing and mapping ecological condition

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Spatial data on ecological condition is fundamental to biodiversity assessment and planning. To date, different approaches for assessing ecological condition have been used in different realms, and there has been no consistent set of ecological condition categories, terms and definitions. The aims of the session are to share information about approaches and methods used in the terrestrial, freshwater and marine realms; to explore whether there are lessons that could be shared across realms, while recognising that there is unlikely to be a one-size-fits-all approach; and to explore the potential for a consistent set of ecological condition categories and definitions across realms.

Background

Spatial data on ecological condition is fundamental to biodiversity assessment and planning, for example:

- Ecological condition is a crucial input layer for assessing ecosystem threat status, and can be important in assessing ecosystem protection level
- In selecting sites or features to meet biodiversity targets, we generally want to avoid those that are in poor ecological condition or where natural habitat has been lost outright
- In prioritising areas for investment in ecological infrastructure, ecological condition is often a crucial factor

To date, the assessment of ecological condition has been approached differently in different realms. For example:

- In the terrestrial realm, certain land cover classes are generally used as a proxy for outright loss of natural habitat. The issue of a consistent national method for assessing and mapping degradation (e.g. as a result of over-grazing or invasive alien plants) remains unresolved.
- For rivers, the Department of Water and Sanitation has a well-developed system of six ecological condition categories (A-F) based on a series of indicators linked to drivers of change and responses, which are scored based on the degree of modification from a natural reference state.
- For wetlands, there are methods for assessing the condition of individual wetlands. At the national level, the proportion of natural land cover in and around wetlands has been used to model wetland condition.
- For estuaries, the DWS system of A-F ecological condition categories is well developed. As for rivers, the assessment of condition is based on a series of indicators which are scored based on the degree of modification from a natural reference state.
- In the marine realm, ecological condition has been estimated through mapping the intensity of a range of pressures, scoring the degree of impact of each pressure on each ecosystem type to create a pressure-impact matrix, and using this information to map likely ecological condition (good, fair or poor).

In addition to multiple approaches to assessing and mapping ecological condition, there is also no consistent set of ecological condition categories, terms and definitions.

Session aims

The aim of the session is two-fold:

- to share information about approaches and methods used to date in the different realms (terrestrial, freshwater, estuarine, coastal and marine), and to explore whether there are lessons that could be shared across realms (while recognising that there is unlikely to be a one-size-fits-all approach)
- to discuss a proposed set of ecological condition categories and definitions (developed at the previous two Provincial & Metro Biodiversity Planning Work Sessions), and to explore the potential for consistency across realms in this regard

Presentations

- Session introduction and proposed ecological condition classes (Mandy Driver, SANBI)
- Overview of the Department of Water and Sanitation's system of Present Ecological State categories for **rivers** (Mandy Driver, SANBI)
- River disturbance index as an approach to assessing and predicting ecological condition of **rivers** (Boyd Escott, Ezemvelo KZN Wildlife)
- Approaches and methods for assessing ecological condition of **wetlands** (Heidi van Deventer, CSIR)
- Mapping ecological condition in the **marine** environment using pressures and habitat-specific impacts (Kerry Sink, SANBI)
- Mapping degradation in the **terrestrial** environment: methodology and results from the LADA (Land Degradation Assessment in Drylands) National Assessment for South Africa (Lehman Lindeque, DAFF)
- What is 'natural': mapping ecological condition in the terrestrial environment and possible approaches for a **terrestrial** ecosystem condition assessment in the NBA (Andrew Skowno, SANBI)

River disturbance index as an approach to assessing and predicting ecological condition of rivers

Boyd Escott

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The use of remote sensing data to inform levels of modification/anthropogenic impact within systematic conservation assessments is not new to systematic conservation planning. Primarily used within terrestrial assessments, and only to a marginal degree in aquatic assessments, this data is often used as an *in situ* informant of the nature of land-use impact on biodiversity. The River Disturbance Index (RDI) uses remote sensing data to inform riverine condition both within an individual catchment, but also through connected catchments thus building

downstream impacts into the optimisation process. It is for this reason that this approach is used by Ezemvelo KZN Wildlife as the aquatic environments equivalent of the terrestrial modification surface within both its estuarine and freshwater systematic conservation assessments. A new addition to this process however, is the development of a pressure surface which takes current temporal change into account, whilst also allowing for the development of a predicted pressure surface which will enhance the prioritisation process. This presentation will highlight the process used in the development of these decision support layers.

What is "natural": mapping ecological condition in the terrestrial environment and possible approaches for a terrestrial ecosystem condition assessment in the NBA

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One of the headline biodiversity indicators used in South Africa, ecosystem threat status, is based on our ability to confidently map the historical extent of a particular ecosystem (in this instance a vegetation type) and confidently determine the condition of the ecosystem. Ecosystem services and ecosystem accounting approaches also require information on the condition of habitats.

In a terrestrial environment for example, we can quite confidently state that the natural habitat in areas now under urban development has been lost. Things get a bit more complicated when habitat that was lost many years ago (through cultivation usually) gets a chance to grow back, forcing us to distinguish between pristine, old growth, or primary habitat, and secondary, near natural or recovering habitats. There are various ways to address this and the extent to which it occurs is relatively limited.

Assessing the condition of an ecosystem on a degradation scale or ecological intactness index across large parts of the country is an even

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more challenging task that requires deep understanding of each ecosystem and how it functions. In some ecosystems and regions there are well established degradation/condition mapping methodologies and spatial products - which are often agricultural in origin. Expanding this to a national coverage is a major goal of the NBA 2018. To achieve it we will need a major collaborative effort between ecologists, agricultural scientists, spatial analysts and remote sensing experts.

Parallel session: Maximising the application value of the National Land Cover 2013/14 (NLC 2013/14) data

Stuart Martin

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Land cover data is a crucial reference dataset that informs a wide variety of activities including environmental planning and protection, development planning, economic development, and compliance monitoring and enforcement. The National Land Cover 2013/14 (NLC 2013/14) dataset provides 72 land cover/land use classes at a 1:75 000 to 1:100 000 data application scale with features ranging from agriculture, forestry, vegetation and wetlands to mining and built up areas, to name a few.

The workshop will focus on two main areas of interest. The first component will provide an overview of the NLC 2013/14 data products and will include an introductory section defining the concept of land cover and land use data, and an overview of the development history of these datasets. This will include an explanation of the semi-automated land cover mapping methodology and the approach to developing the dataset based on Landsat 8 imagery.

The second half of the workshop will focus on the potential of the dataset in providing information in support of decision making. Applications of the dataset will be demonstrated and key applications will be discussed and presented.

This overview will assist users in positioning the NLC 2013/14 dataset, and will inform users of how the data was captured and can be used in support of operational, tactical and strategic decision making, policy formulation and the development of the necessary planning tools.

Parallel session: Strengthening the science-policy interface for effective planning: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

Carmel Mbizvo[1], Luthando Dziba[2] and Kiruben Naicker[3]

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A new platform has been established by the international community - the 'Intergovernmental Platform on Biodiversity and Ecosystem Services' (IPBES). IPBES was established in April 2012, as an independent intergovernmental body open to all member countries of the United Nations with the overall objective to provide policy relevant knowledge on biodiversity and ecosystem services to inform decision making. The members are committed to building IPBES as the leading intergovernmental body for assessing the state of the planet's biodiversity, its ecosystems and the essential services they provide to society.

IPBES provides a conceptual framework recognized by both the scientific and policy communities to synthesize, review, assess and critically evaluate relevant information and knowledge generated worldwide by governments, academia, scientific organizations, non-governmental organizations and indigenous communities. The four agreed functions include knowledge generation, assessment, policy support tools and capacity building. The implementation of the IPBES work programme involves a global pool of experts conducting assessments of such information and knowledge in a transparent and collaborative way. IPBES is unique in that it will aim to strengthen capacity for the effective use of science in decision-making at all levels. IPBES will also aim to address the needs of Multilateral Environmental Agreements that are related to biodiversity and ecosystem services, and build on existing processes ensuring synergy and complementarities in each other's work.

This session will include inputs and group discussion on:

- An overview of IPBES: Kiruben Naicker (DEA IPBES national focal point)
- Strengthening the Science-Policy Interface: IPBES Capacity Building Programme: Carmel Mbizvo (SANBI)
- Africa Regional Assessment Process and Knowledge, Information and Data Strategy and Action Plan: Luthando Dziba (CSIR)

Parallel session: Setting targets for species in biodiversity plans

Domitilla Raimondo and Lize von Staden

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The setting of species targets in biodiversity planning and assessment still lags behind the setting of ecosystems targets in terms of integrating planning targets with measuring of protection levels for all species, not just those that are of conservation concern. In addition, there is a misalignment in current target setting practices between species and ecosystems - ecosystem targets are set at representation levels (Critically Endangered thresholds), while species targets are set at persistence levels (Vulnerable thresholds). In this workshop session we will:

- Review the strengths and weaknesses of current species target-setting methods;
- Outline the requirements for an integrated system that would work for all species, ideally across terrestrial, marine and freshwater systems;
- Review some key alternative target-setting methods from the scientific literature;
- Present, for discussion, a proposed outline of methods for setting species targets that meet the requirements of an integrated system, as well as align more closely with the ecosystem approach to target setting.

Presentations

1. KwaZulu-Natal and Free State provinces - how species targets are currently set in biodiversity plans, Boyd Escott (escottb@kznwildlife.com) and Nacelle Collins (collinsn@detea.fs.gov.za)

2. Summary of existing publications that set targets for species in biodiversity plans, Lize von Staden (l.vonstaden@sanbi.org.za) and Domitilla Raimondo (d.raimondo@sanbi.org.za)

3. Important challenges that need to be taken into account when setting targets and a suggested framework for setting targets for species in South Africa, Lize von Staden (l.vonstaden@sanbi.org.za), Domitilla Raimondo (d.raimondo@sanbi.org.za) and Dewidine von der Colff (d.vandercolff@sanbi.org.za)

Parallel session: Implementing biodiversity plans: case studies, lessons and challenges

Developing products to support implementation of Mpumalanga Biodiversity Sector Plan and bioregional plans within Mpumalanga

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The implementation of the Mpumalanga Biodiversity Sector Plan (MBSP) is reliant on a range of supporting products that include both printed and electronic media. Bioregional plans are informed by the Biodiversity Sector Plan, and MBSP products support the implementation of bioregional plans.

The MTPA first focused on developing a range of products following the completion of the spatial biodiversity assessment to provide for the necessary contextual information, explain how the sector plan was developed, and the development of the supporting land-use guidelines. These products included the development of the: (1) MBSP Handbook; (2) MBSP Wallmap: (3) Technical document; (4) Online web app, (4) Mobile Android app (Mpumalanga Biodiversity Plan); (5) stand-alone GIS viewer and (6) shapefiles. After finalising the Sector plan, the MTPA developed the draft Gert Sibande Bioregional Plan. The proposed bioregional plan was informed by the Sector MBSP but content focused on information relevant to the district. Two additional products are being developed for implementation of the bioregional plans: GSBP User Guide and GSBP Wallmap. Positive feedback received from DMR and municipalities supports MTPA's investment into a range of products. MTPA acknowledge support of Grassland Programme and WWF.

Progress with the Waterberg Bioregional Plan and lessons learned

Philip Desmet[1], Deborah Vromans[2], Andrew Skowno[1], Stephen Holness[1] and Johan Kruger[3]
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The Limpopo Department of Economic Development, Environment and Tourism (LEDET) has embarked on a five-year process of converting the 2013 provincial conservation plan into district-level bioregional plans beginning with the Waterberg District. The process of developing the Waterberg Bioregional Plan (WBP) is nearing completion and the draft bioregional plan document is being reviewed by the Bioregional Plan Review Panel. Important lessons that we have learned from this process include:

1. The spatial dimension of the Map of Critical Biodiversity areas has been significantly altered to accommodate stakeholder inputs and concerns. These concerns relate mainly to reflecting existing zonation (e.g. core biodiversity areas and corridors) and information (e.g. game farms) reflected in sector planning tools such as the Waterberg Biosphere Reserve, EMF, and district and local SDFs. These issues could be pre-empted if all existing sector planning spatial data were better integrated when developing the provincial conservation plan. Unfortunately, the process of gathering this information is tedious and time consuming as no up-to-date repository for this information exists.
2. Stakeholder engagement was primarily aimed at district officials and NGOs. Uptake of the WBP could be improved by more effective targeting of local municipal officials whose responsibility it is to integrate the WBP into local SDFs.
3. The relationship between the WBP CBA map/land-use guidelines and SPLUMA is unclear and needs to be clarified.

The Ekurhuleni Metropolitan Municipality (EMM) experience on the compilation of the bioregional plan and the mainstreaming thereof in Spatial Development Frameworks (SDFs)

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Two Acts are applicable in this case

1. Spatial Planning and Land Use management Act, 2013 (SPLUMA)

2. National Environmental Management: Biodiversity Act, 2004 (NEM:BA)

In terms of SPUMLA, 2013, Sections 20 (2) states that:

"The municipal spatial development framework must be prepared as part of a municipality's integrated spatial development framework in accordance with the provisions of the Municipal Systems Act."

Section 21 (j) & (m) deal with the content of the SDFs with specific reference to the environment while Section 22(1) deals with the legal status of a SDF. In terms of the NEM: BA, 2004 Section 48, deals with bioregional plans and their status.

In 2010, Ekurhuleni Metropolitan Municipality (EMM), in partnership with the Gauteng Department of Agriculture and Rural Development (GDARD) and the South African National Biodiversity Institute (SANBI), embarked upon the development of a bioregional plan for Ekurhuleni. After the necessary consultation processes were followed and review by the Bioregional Plan Review Panel the final draft of the EMM Bioregional Plan was received in October 2014. The EMM Bioregional Plan was published for public comment on 31 March 2015.

EMM City Development in 2014 embarked on the development of 6 Regional Spatial Development Frameworks (RSDs). As part of the development of the RSDFs the various EMM environmental plans including the bioregional plan were consulted and used to supply baseline information for the SDFs.

The presentation will deal with:

- The challenges experienced in the bioregional planning process and lessons learned;
- The need for buy in from other sister departments; and
- The benefits of mainstreaming the bioregional plan through the SDFs.

Update on planning and implementation in the City of Cape Town

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The City of Cape Town (CCT) is located within a global biodiversity hotspot. In order to secure this biodiversity for future generations and ensure that IDP objectives are met, the latest biodiversity planning methods and tools need to be applied. The systematic biodiversity plan for CCT (Biodiversity Network), incorporated as the CBA map in the draft Cape Town Bioregional Plan, is a key informant in the Cape Town Spatial Development Framework, Environmental Management Frameworks (EMFs) and Spatial District Plans (SDPs), and helps to guide development towards a sustainable city. This paper serves to give:

1. An update on the current status of biodiversity planning in the City of Cape Town
2. The details and issues surrounding the approval process for the Cape Town Bioregional Plan.
3. The importance of locating the current BioNet (Cape Town's systematic biodiversity plan) within a MOSS system.

Incorporating the Garden Route Biodiversity Sector Plan 2010 into the Knysna Municipality Integrated SDF 2015

Maretha Alant[1] and Johan Baard[2]

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The entire Knysna Municipality is located in the Garden Route National Park (GRNP) buffer zone and mainstreaming biodiversity and climate change adaptation into the Knysna Integrated Spatial Development Framework (ISDF) is very important to SANParks. Key issues are:

1. The Knysna Municipal area contains critically endangered, endangered and vulnerable listed threatened ecosystems, as published in the Government Gazette on 9 December 2011. The Garden Route Biodiversity Sector Plan was published in 2010 and the spatial footprints of the Critical Biodiversity Areas (CBAs) and critically endangered vegetation are not overlapping.
2. The draft ISDF states that due to the destruction of natural habitat it is presently only possible to protect the steep slopes and valleys around rivers, an incorrect statement.
3. The Western Cape PSDF 2014 places biodiversity in position 1 and the Knysna ISDF Guiding Legal Framework places biodiversity in position 10.
4. The GRNP buffer zone is predominantly on private land and has no 'special or formal' legal status.

Mainstreaming biodiversity is a serious challenge without the municipal political will to embrace landscape scale conservation.

Evaluating the Impact of CBA Maps

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Systematic Conservation Planning is a globally used tool. With the use of CBA maps South Africa has pioneered the field in terms of converting plans into on the ground action. As a result, lessons are being learned in the implementation process that have global relevance. In order to properly capture these lessons and provide valuable feedback on the process, an assessment of the impact of CBA maps is required.

In order to meet this need, my work is focused on evaluating the effectiveness of the CBA maps. As these tools function in a complex and dynamic political environment, using the right evaluation approach is essential. I propose a qualitative approach that's sensitive to the social and political factors and examines the system in a holistic manner.

For this session I propose presenting the methods I have developed, followed by a discussion of what the key issues faced in CBA implementation are and whether the proposed methods are suitable. I thoroughly welcome feedback and debate.

Parallel session: Identifying priority ecological infrastructure in the uMngeni River catchment

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The uMngeni River catchment in KwaZulu-Natal is a rapidly growing centre of economic activity. The catchment houses several major dams, including Midmar, which is the major water supply dam to the thriving cities of Durban and Pietermaritzburg. Economic and population growth in the catchment is increasing, placing significant pressure on the catchment's natural resources. Water is arguably the most important of these, and impacts on water quality and quantity are already more than evident. Funded by the Green Fund, the University of KwaZulu-Natal in partnership with the South African National Biodiversity Institute (SANBI) is undertaking a project to assess whether the challenge of sustaining good quality water delivery in the catchment can be achieved through investment in ecological infrastructure. This implies rehabilitating and/or securing key ecosystems, including grasslands, riparian areas and wetlands. The team is making use of recent land cover data and a daily-timestep hydrological model to identify priority areas in terms of delivery of hydrological ecosystem services such as dry season baseflow. Initial results from the mapping and modelling completed for the upper uMngeni to date will be presented at this workshop, together with proposed methods for prioritising key ecological infrastructure, for further discussion.

Parallel session: Implementing biodiversity plans and accessing biodiversity data

Implementation of Critical Biodiversity Areas in the landscape: beyond legislated protected areas

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Critical Biodiversity Areas (CBAs) are the minimum, most efficient set of areas required in order to meet national biodiversity thresholds. The Protected Area Expansion Strategies (PAES) are aimed at a sub-set of the highest priority CBAs for protection through conservation in terms of the National Environmental Management: Protected Areas Act (Act 57 of 2003) (NEM:PAA), primarily through stewardship in the Western Cape, taking into consideration resource constraints.

Non-PAES priority CBAs are protected from selected development through the EIA regulations. However, the persistence of CBAs which are not protected can be compromised through degradation, poor management, etc. CapeNature have investigated the role of planning legislation, zoning schemes and municipalities. The Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) has a proposed Standard Draft Municipal Zoning Scheme By-Law which includes two different level conservation zonings. Management plans can be a requirement. Landowners need to be encouraged and acknowledged for good land conservation practices.

Within this context, development applications in CBAs may be considered for biodiversity offsets, which should be formally conserved and fit in with the PAES. Similar are on-site set asides, although CBAs aren't compromised. These reactive stewardship sites are included in the PAES, but non-NEM:PAA conservation areas may also be linked to development.

Lower level conservation options should still conceivably contribute towards Aichi Biodiversity Targets.

Biodiversity offset implementation in the Western Cape: policy versus practice

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Alternatives in the landscape are becoming increasingly limited to meet demand for various land uses. This is resulting in pressure to develop or extract resources within Critical Biodiversity Areas (CBAs). Often the need for socio-economic development leads to positive authorisations in areas which should be conserved. It has become apparent that the need to successfully properly investigate, implement and manage offsets, during and after the development application process is essential. Whilst South Africa is still in the process of developing offset policies and guidelines, it is important to learn from some of the experiences that have been had so far. Even when a desired offset is calculated and included as a condition of authorisation, there are many challenges that need to be overcome before they can be considered successful. Using examples where biodiversity offsets have been required; this presentation challenges the use of biodiversity offsets as a "last resort" and discusses the possibility of the offset investigation being concluded earlier in the Environmental Impact Assessment process with potential benefits to conservation and developers.

Sub-national implementation: a tale of four cities

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The project, Urban Natural Assets (UNA) for Africa, entails engaging and capacitating Sub-Saharan African local governments to better manage biodiversity and contribute fully to the attainment of the Aichi Biodiversity Targets at the sub-national level. To this end, a series of consultative workshops and training events are being organised in four participating cities, namely, Addis Ababa, Cape Town, Dar es Salaam, and Lilongwe. The project is funded by SwedBio, managed by ICLEI – Local Governments for Sustainability, and executed in partnership with the South African National Biodiversity Institute (SANBI). This presentation reports on the project's findings to date, identifying key issues facing local governments and proposing a set of solutions with which to address them**.**

Accessing biodiversity data

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Biodiversity information plays an important role in support of improved environmental decision-making. Therefore, biodiversity information should be represented in a relevant and informative manner, displaying the most important aspects of biodiversity information such as metadata and taxonomic information. The Global Biodiversity Information Facility (GBIF) developed a solution of publishing primary occurrence biodiversity information and thus making the data freely available to the public. The South African Biodiversity Information Facility (SABIF) managed by SANBI, a GBIF country node, mobilises primary biodiversity information making it freely available to the public. This primary biodiversity information informs policy makers, managers and researchers, contributing to South Africa's sustainable development.

The presentation will focus on the primary biodiversity data published through SANBI as well as highlight the infrastructure used in publishing these data. It will also focus on South African primary biodiversity data that is accessible through the GBIF portal. This presentation will also look at the road ahead.

BGIS: the road ahead

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The BGIS website (http://bgis.sanbi.org) is a core part of the South African National Biodiversity Institute's identity. The website, which has been around since 2005, aims to assist users to make informed land-use decisions by providing free access to biodiversity-related spatial datasets, and by providing users with the basic tools to view, analyse and interrogate these layers.

This presentation looks at the road ahead. It will touch on SANBI's vision to redesign its current information environments and create an integrated National Biodiversity Information System (NBIS), and will focus on how BGIS fits into this overall infrastructure evolution. The presentation will discuss mobile applications, moving away from Silverlight Viewer to HTML5, integrating species localities, and utilizing partner organizations rest points to limit the burden on SANBI's servers.

SANBI would also like to use this opportunity to obtain feedback and suggestions from partner organizations and stakeholders.

Parallel session: Innovative approaches and methodologies

The role of resource directed measures in biodiversity conservation

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The National Water Act (NWA) prescribes a series of measures intended to ensure the comprehensive protection of water resources. These include the water resource classification which produces a management class for significant water resources and resource quality objectives (RQOs) which give effect to this class through measurable management goals. The NWA enables RQOs to be set for the regulation or prohibition of instream or land-based activities. While it is not yet clear how this provision will be applied, it has bearing on government agencies tasked with the administration of terrestrial environments. These measures therefore provide an opportunity to further the conservation of both aquatic and terrestrial biodiversity. Not only do they consider biodiversity information within their respective processes but their outputs are binding on all organisations and institutions thereby affording legal protection to selected biodiversity imperatives. This paper explores the linkages between resource directed measures and biodiversity conservation and suggests how conservation agencies could use these measures to further their own mandates.

Systematic land-cover change in KwaZulu-Natal, South Africa

Debbie Jewitt[1], Peter Goodman[2], Barend Erasmus[3], Tim O'Connor[4] and Ed Witkowski[3]
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Habitat loss is recognised as one of the major drivers of biodiversity loss in the world. KwaZulu-Natal (KZN) contains high levels of biodiversity but is experiencing a rapid loss of natural habitat. The patterns, processes and rates of land-cover change in the province were investigated in order to effectively plan for biodiversity conservation. The Intensity Analysis Framework was used to investigate the systematic land-cover changes occurring in the province using three land-cover maps (2005, 2008 and 2011) commissioned by Ezemvelo KZN Wildlife. The rates of habitat loss between 1994 and 2011 were determined using additionally, the national 1994 and 2000 land-cover maps. Between 2005 and 2011, 7.6% of the natural habitat of the province was converted to anthropogenic land-uses. Habitat loss was driven by agriculture, timber plantations, the built environment, dams and mines. The swapping of anthropogenic categories back to secondary vegetation was tracked. The annual rate of habitat loss since 1994 was 1.2% per annum. The biodiversity conservation implications of these landscape changes are discussed and recommendations for fulfilling legislative requirements are made. The loss of natural habitat in KZN is significant, posing challenges for biodiversity conservation. Bolder thinking on the part of conservation professionals is required if this biodiversity is to be safeguarded for future generations to enjoy and benefit from.

The 2014 North West Biodiversity Sector Plan

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The North West is currently developing a Biodiversity Sector Plan (BSP 2014). Since developing a Biodiversity Assessment in 2009, the Province has undertaken a Biodiversity Inventory Project for the following taxon groups: plants, mammals and birds. A 2010 provincial land cover dataset and a 2013 national land cover dataset have also been acquired. The provincial vegetation map has been aligned to the geology and land facet maps and we are also looking at enhancing the NFEPA products with the Habitat Integrity/River Health data collected by Department of Water

Affairs. Today we would like to present some maps and accompanying data to generate discussion among the workshop participants about what could be done to enhance our final biodiversity sector plan.

Challenges incorporating new land-use practises in the wildlife industry into biodiversity planning processes

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The substantial contribution that landowners of extensive wildlife areas in South Africa made to provincial and national conservation targets has been acknowledged by many. Recent changes in the wildlife ranching industry necessitate a review of this contribution as game ranching practices increasingly include intensive and selective breeding of indigenous game species for commercial purposes. Financial return on investment from these practices are seen to outcompete that gained from traditional extensive game farming. The net result is a growing shift from traditional extensive game farming to a series of small intensive breeding facilities that are often enclosed with impermeable fences. The potential threats of these practices to biodiversity are currently being debated. In this paper, site and cumulative impacts at a landscape level are highlighted. Concern is further raised that the regulatory mechanisms set in place to limit and moderate the impact of subdividing the natural landscape into small compartments is not applicable to this industry. In the absence of regulation, the conundrum facing the spatial biodiversity planning community is how to detect and incorporate this rapidly fragmenting landscape and the concomitant loss of ecological connectivity, caused by the intensive wildlife industry, into spatial biodiversity planning processes and the conservation of South Africa's biodiversity.

National Red Listing and spatial data: an untapped frontier to estimate extinction risk

Matthew Child[1], Harriet Davies-Mostert[1] and Domitilla Raimondo[2]
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Red Listing relies on five quantitative criteria (based on population size, trends, geographic distribution and threat severity) to measure extinction risk. For larger mammals (for example, antelopes and carnivores), which in South Africa are mostly restricted to fenced reserves and for which accurate count data is often available, Red List statuses are primarily based on population size or trends. However, the majority of our mammals are small and exist extensively outside of protected areas. Density (and thus population) estimates are rarely available for small mammals and we thus mostly rely on geographic distribution (criterion B) and habitat trends as a proxy for population trends. Small mammals are very poorly sampled and in order to accurately assess them proxies for population decline based remaining habitat and loss of habitat can help. One estimate that is important for listing is how much suitable habitat or Area of Occupancy (AOO) is untransformed. One further crucial step is being able to accurately calculate the rate of specific habitat loss (for example, Carletonville Dolomite Grassland) on a national scale that could be used to infer species population declines. Finally, integrating multiple spatially explicit datasets allows us to quantify threats far more accurately (for example, by estimating the proportion of the AOO within harvesting distance of rural settlements for species threatened by traditional medicine or illegal trade). Thus, spatial data has the ability to transform Red List assessments for small mammals from clunky and granular approximations to nuanced and dynamic landscape measurements based on the ecology of species. We present four examples of how spatially-explicit analyses have been used to successfully list small mammal species in the current revision of the Red List of Mammals of South Africa, Lesotho and Swaziland.

The value of marine spatial planning to assist in the development of biodiversity management plans for marine ecosystems

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There are significant challenges in successfully balancing demands for marine resources, economic development and conservation. The concept of merging Marine Spatial Planning (MSP) and Ecosystem-Based Management (EBM) has become important globally in managing the link between socio-economic benefits and ecological integrity. The development of Biodiversity Management Plans (BMPs) for marine ecosystems will not only support the MPA Representative Network and the MPA/MSP Discovery, Research and Monitoring Programme, identified as part of the Operation Phakisa, it will also ensure that other vulnerable marine ecosystems outside the realm of this scope are managed. The BMPs can also set indicators/thresholds and monitor various activities within these marine ecosystems, and ensure that proper management interventions are in place. This concept will support the objectives of the MSP while safeguarding the integrity of ecosystem health and productivity fundamental for social, economic and ecological benefits.

To commence the development of the BMPs, the following are required:

- Drafting and gazetting the National List of Marine Ecosystems (following proper legal prescripts
- Prioritising ecosystems outside the MPAs (including proposed offshore MPAs);
- Thinking about the idea of monitoring (e.g. ensure adequate resources, skills and human capacity), and therefore start involving people and institutions that do research on the marine ecosystem, to consolidate the recommendations from research as well as identifying research needs for marine ecosystems.

Abstracts: Posters

Characterising historical land cover change and understanding the drivers: a case study of Goukou Catchment in the Western Cape, South Africa

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The greater demand for goods and services across the globe drives land cover change, due to human pressure which in turn grows the unsustainable consumption patterns of natural resources and compromises the environment and ecosystem service delivery. The main focus of this study was to document the types, geographic distributions, and rate of land cover changes and to understand the motive behind these changes and the consequences of land cover change. This was done by looking at land use change, ecosystem services, water quality and quantity, impacts of land cover change on climate change and ecological infrastructure.

Two sets of data were used in this study: colour infrared (CIR) images, and black and white aerial photographs. CIR images were analysed by using on-screen digitising. Black and white images were analysed using several steps: projection, geo-referencing, mosaic, subset and textual analysis (which comprises running filters over kernel window sizes; filters: variance, skewness, kurtosis and Mean Euclidean Distance; kernel window sizes were 3x3, 5x5, 7x7, 13x13 and 25x25).

Results show that there is a rapid increase of cultivated fields over the years followed by an increase in disturbed areas, aliens and dam construction. Natural vegetation and wetlands are diminishing; this is due to conversion of natural area to agricultural fields.

Implementing the Land Use Incentives Programme (LUI) under working for water (BSP) for alien clearing in the Knysna municipal area and Garden Route National Park (GRNP) buffer zone

Malusi Nxumalo and Nonhle Luthuli

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The Garden Route National Park (GRNP) and buffer zones forms an integral part to biodiversity planning. Most of buffer zone for the GRNP is private land and ecological restoration of forests, riverine and frontal dunes in buffer zones is important to SANParks to ensure ecological connectivity between the park and privately owned land. Key issues identified include the widespread infestation of alien plants on private land (black wattle and blue gum trees), loss of indigenous lowland fynbos and riverine vegetation, and the impact of alien infestation on water quality and quantity in the Knysna river systems. The Working for Water Programme implemented by SANParks established the Land Use Incentives Programme (LUI) in 2008 to clear alien vegetation (along the forest, fynbos, riverine and frontal dunes) on private land. The programme works mostly with conservancies (Gouna, Phantom Homtini, and Knysna river conservancies) and prioritization is voluntary, based on landowner willingness. A number of methodologies are employed in the field including clear fell methodology and chain saws. A number of contracts have also been signed and private properties cleared. However, challenges still surface mostly on fuel load and follow up queries on mortality.

List of delegates

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