

Summary Report

Freshwater Ecosystem Network

Monday, 24 and Tuesday, 25 November 2014 @Pretoria National Botanical Garden

In attendance : See Annexure 1 for list of participants

Programme : See Annexure 2 attached, for the full two day programme

The 2014 Freshwater Ecosystem Network (FEN) is a community of practice related to freshwater ecosystems, convened annually by the South African National Biodiversity Institute (SANBI). The 2014 meeting focused on the Freshwater Component of the National Biodiversity Assessment (NBA) 2017.

John Dini, SANBI's Director of Ecological Infrastructure set the scene by welcoming the attendees and introducing the programme for the two days. Dini reminded participants that the purpose of the network is 'to provide a space for joint learning, coordination and networking around freshwater ecosystems; and identify key needs in the sector and what SANBI can do to support these'. Nadine Slabbert, Director Resource Quality Services at the Department of Water and Sanitation (DWS) welcomed participants to the FEN workshop on behalf of Ndileka Mohapi, Chief Director Water Ecosystems at DWS; and highlighted that the different mandates of various institutions for freshwater ecosystem protection and management should be seen as complementary and not overlapping; and if coordinated well can guide all role players towards a common goal.

The FEN included an introductory workshop which was held on 24 November, prior to the main FEN meeting on 25 November.

Introductory Workshop – 24 November

Mandy Driver from SANBI and Jeanne Nel from the Council for Scientific and Industrial Research (CSIR) coordinated the introductory technical session which included: an introduction to the NBA 2011, with a focus on the freshwater component; explanation of the relationship between National Freshwater Ecosystem Priority Areas (NFEPA) and the NBA 2011; and explanation of key concepts and terminology from the NBA 2011 freshwater component and NFEPA.

NBA 2011, with a focus on the freshwater component

The NBA provides a summary of the state of South Africa's biodiversity (, covering terrestrial, freshwater, estuarine and marine environments; and reports on two headline indicators, namely ecosystem threat status and ecosystem protection level. The NBA is produced every five to seven years with the first one being published in 2004, called the National Spatial Biodiversity Assessment, and the second one in 2011. The NSBA 2004 was the first assessment of ecosystems across terrestrial, river, estuarine and marine environments. Wetlands and invasives were included in the NBA 2011, with more focus on indigenous species and climate change. The NBA 2011 was downloaded more than 100 000 times in the first year it was available online, indicating that the information in the publication is in high demand. The NBA 2011 noted twelve highlights, with the following three freshwater highlights ranking as the top three:

- wetlands are the most threatened of all South Africa's ecosystems, with significant negative implications for the important services that wetlands provide, such as flood regulation and water purification
- high water yield areas (now called Strategic Water Source Areas) are South Africa's water factories, and make up less than 4% of the country's area, with very low levels of formal protection in spite of their strategic importance for water security
- tributaries are generally in better condition and less threatened than main rivers, and play an important role in supporting the functioning of main rivers

The NBA 2011 synthesis report and technical reports can be accessed at <http://bgis.sanbi.org>.

National Freshwater Ecosystem Priority Areas (NFEPA) and the NBA 2011

The NFEPA project started from 2008 until 2011; and underpinned the freshwater component of the National Biodiversity Assessment 2011 which took place from 2009 to 2012). NFEPA identified a national network of spatial priorities for conserving water ecosystems and supporting the sustainable use of water resources, and explored institutional mechanisms for their implementation. The outputs of the NFEPA project were: NFEPA atlas, technical report, implementation manual and associated GIS data. *The Atlas of Freshwater Ecosystem Priority Areas in South Africa* shows all maps developed by the NFEPA project, including FEPA maps per Water Management Area, national map products, and maps of input data layers. Each map shows river priority areas and the associated land that drains into that particular river reach, called the sub-catchment. The map also shows wetlands and clusters of wetlands that are priorities. The *technical report* explains the scientific methods and stakeholder engagement process used to create the map products and the analysis of legal and institutional mechanisms available for implementing NFEPA products. The report also describes the approach and concepts used, to guide the project in developing an institutional basis for effective uptake of these maps. The purpose of the *implementation manual* is to provide guidance on how to use the FEPA maps in the water sector, the biodiversity sector and other key sectors, whose planning and decision-making impacts on freshwater ecosystems. The *NFEPA DVD* includes GIS shapefiles and metadata for all NFEPA spatial data layers, A3 PDFs of FEPA maps per Water Management Area, an open source map viewer, and slide presentations on NFEPA.

Key concepts and foundations for the NBA

There are two key concepts for the NBA, namely the national ecosystem indicators, and the foundational data sets.

National ecosystem indicators: Ecosystem threat status and ecosystem protection levels are the two national ecosystem indicators. Each indicator consists of four categories. The categories for *ecosystem threat status* are: critically endangered (CR), endangered (EN), vulnerable (VU) and least threatened (LT). The categories for the *ecosystem protection levels* are: unprotected, poorly protected, moderately protected and well protected.

Foundational data sets: The foundational data needs for assessing threat status and protection level include:

- Ecosystem types
- Biodiversity targets
- Ecological condition
- Protected areas

Freshwater Ecosystem Network Workshop – 25 November

Update on NWRS, and implementation plan for chapter 5

Magda Ligthelm, Director Strategy from DWS provided an update on the second National Water Resource Strategy (NWRS2), which is a legal instrument for implementing the National Water Act (Act 36 of 1998) and sets out the vision, principles, goals and strategic actions for achieving effective water management. DWS is currently leading the development of an implementation plan for the NWRS2. DWS officials were allocated as chapter leaders by the Minister, to lead on the development, consultation and implementation of each chapter of the NWRS2. In addition representatives were allocated to stand in, in the absence of chapter leaders. Ndileka Mohapi is leading on chapter 5, 'Water resources protection', supported by Yakeen Atwaru who represents Mohapi at the implementation meetings.

The Water Sector Leadership Group (WSLG) have been identified as a stakeholder platform to present the NWRS2 to and will be involved in the consultation, implementation and drafting of the strategy, as there is a consistency in the stakeholders represented on this group. The WSLG consists of representatives from DWS, CEOs and managers in water use companies such as Nestle. The WSLG have set up task teams for each of the different sectors (such as agriculture, energy, mining, local government), including a skills task team.

The NWRS2 implementation plan spans five years and will focus on implementing the strategic actions listed in each chapter. Key milestones for the implementation plan include the launch of the consolidated implementation plan and associated monitoring framework by March 2015; develop annual NWRS2 implementation progress report by June 2015; produce NWRS2 mid-term review report by December 2016; and finalising of National Water and Sanitation strategy 1 by June 2018.

The priority chapters for implementation are 4 (Water resources planning, infrastructure development and management), 6 (Equitable water allocation), 7 (Water conservation and water demand management), 9 (Regulation of the water sector) and 11 (International cooperation and trans-boundary water course management). Although chapter 5 is not one of the priority chapters, there is nonetheless a need for an implementation plan for chapter 5, and there are indicators for this chapter in the DWS Annual Performance Plan.

Ligthelm provided an update on what is can be achieved in the short term. She also informed the group that section 5.4.10 - 'target actions with immediate benefits', will be moved to chapter 6. FEN members indicated that they would like to support the development of the implementation plan for chapter 5. SANBI, CSIR and WWF were mandated to take forward the discussion with DWS.

Outline of the NFEPA implementation manual

At the request of some of the participants, an ad hoc presentation was made on the NFEPA project and its products, specifically the NFEPA implementation manual. The purpose of the implementation manual is to provide guidance on how to use the FEPA maps in the water sector, the biodiversity sector and other key sectors, whose planning and decision-making impacts on freshwater ecosystems. FEPA maps provide a single, consistent national source based on best available science and the collective knowledge of South Africa's freshwater ecological community. They indicate how many rivers and wetlands, and which ones, should remain in good condition (equivalent to an A or B ecological category as defined by DWS).

The NFEPA implementation manual is aimed at those involved with, or contributing to, any planning or decision-making process that should take freshwater ecosystems into account. Intended users include water resource planners and managers, land use planners and land-use decision-makers, and those involved in conservation and rehabilitation. **Chapter 2** of the implementation manual explains the categories shown on the FEPA maps (river FEPAs and associated sub catchments, wetland FEPAs, estuary FEPAs, wetland clusters, fish sanctuaries and associated sub-quaternary catchments, Fish Support Areas and associated sub-quaternary catchments, and Upstream Management Areas). **Chapter 3** answers a range of frequently asked questions; and **chapter 4** outlines roles and responsibilities of key implementers of the FEPA maps, including DWS, DEA, SANBI, SANParks, provincial conservation authorities, and Catchment Management Agencies. **Chapter 5** provides guidelines on how to use the FEPA maps in a range of contexts; **chapter 6** provides ecosystem management guidelines for river FEPAs, wetland FEPAs, sub quaternary catchments associated with river FEPAs, and Upstream Management Areas; and **chapter 7** summarises key messages and recommendations of the NFEPA project.

National Biodiversity Assessment (NBA)

Mandy Driver provided an introduction to the NBA, starting with a definition of the term 'biodiversity' which comprises of the following components: ecosystem diversity, species diversity and genetic diversity. Driver proceeded to explain that the NBA is part of SANBI's mandate to monitor and report on the state of biodiversity. More than 200 scientists and practitioners from over 30 organisations contributed to the NBA 2011.

Review and Reflection of the Freshwater Component of NBA 2011

The presentation touched on the freshwater-related findings of the NBA 2011. The top 12 highlights of the NBA 2011 were reviewed (the first three of which deal with freshwater ecosystems – see Introductory Workshop notes above); as well as the National Ecosystem Classification System; and national ecosystem indicators with a particular focus on the ecosystem threat status and protection level for rivers. The four fundamental pillars for the NBA were discussed. These pillars are: the classification and mapping of ecosystem types; map of protected areas – land based and marine; maps of ecological condition; and biodiversity targets for ecosystem types. The presentation also focused on the link between the NBA and policy; and noted that the NBA informs the National Biodiversity Strategy and Action Plan (NBSAP – CBD requirement), which in turn informs the National Biodiversity Framework (NBF – Biodiversity Act requirement).

In summary, the NBA provides the scientific basis while the NBSAP and NBF are more action oriented on how to respond to the outcomes of the NBA. The relationship between the NBA and NFEPA was also touched on. It was noted that much of the information for the freshwater component of the NBA 2011 was derived from the NFEPA process.

The NBA 2017 provides a further opportunity for partners to be involved and will require extensive involvement of the freshwater community in the process. The group looked at the NBA 2017, touching on existing task teams and advisory group; the NBA 2017 timeframe; components of NBA 2017 with a cross cutting theme of 'benefits of biodiversity'. Components of the NBA are: terrestrial, freshwater, estuarine, marine and coastal. Each component in the NBA 2017 will have a component leader and team, a reference group, broad consultative workshops, and external reviewers. Outputs of NBA 2017 will include: a conceptual framework, component technical reports, a synthesis report, a popular summary report, peer-reviewed papers, and the data and metadata.

Impact of NBA in practice

The group had discussions around if and how the NBA and NFEPA tools are being used by the various partners in the sector. The overall feedback is that the NBA is less frequently used compared to the NFEPA tools, specifically the NFEPA maps. A summary of the discussion is provided below.

DAFF: use the FEPA maps, especially the wetlands, and want a software programme that they can use it with.

National and regional DWS RDM, Strategic planning, RQS: use the FEPA maps in the DWS classification process, water licensing applications when they come to the planning directorate but they don't see all the applications. Used in wetland monitoring programme, RQO planning and setting and monitoring of drivers. FEPAs also used as red flags in applications. In setting RQOs need to decide where to put a resource node and then this informs how they are managed. Also use FEPAs iteratively in the PES/EIS process. Stats of NBA are used to motivate for projects. Also use NBA in high confidence studies at a local level. They perceive more opportunities to use NBA in terms of listing of threatened ecosystems.

DEA & provincial agencies: use FEPAs in identifying their provincial CBAs, also incorporated non-spatial information in the NBSAP, incorporate the FEPAs in monitoring plan, incorporate in fish management plans, incorporate FEPA and NBA recommendations into comments on EIAs and ecological reserves. Consulted also on stewardship issues. All of this is fully integrated into their workplans. DEA used FEPAs in Ramsar management plan. Used to motivate application for Biosphere work. Used in EMFs and provincial protected areas expansion strategy. GDARD usually do not use FEPAs because they have higher confidence biodiversity plan, but think that FEPAs influenced the selection of their higher confidence plan. FEPAs incorporated into KZN informant for the EIA – a tool that shows all red flags for EIAs, but having issues of scaling and having double products with KZN plan and FEPA – so now are using PES data to inform their new assessment.

SANBI vegmap: would like to work wetlands into their vegmap, but there are issues with the foundational data.

Inkomati CMA: Have not used NBA but operate on the assumption that their involvement in River Health will provide the data and implement the outcomes of the areas that have been identified as

problem areas. They have used the FEPA maps to identify areas with high density of FEPA wetlands to avoid development in these, especially in buffer zones. The draft CMS refers to FEPAs. Could try and see if the next draft could refer to NBA stats.

Water Research Commission: use FEPAs to influence where scientists work. Could influence NBA and wetland inventorying as well.

WWF: use NBA stats and use FEPAs to motivate water stewardship when dealing with sustainable agriculture and mining.

Planning and coordinating of freshwater data for the NBA 2017

This participatory session focused on discussions on priority issues or focus of the freshwater component of the NBA 2017; and data priorities for the freshwater component. The following questions were used to frame the discussion:

- What should the objectives of the NBA 2017 include?
- Data standardisation – wetlands and river networks, ecosystem classification, scale of catchments to be used?
- How do we deal with national vs provincial products and scale?
- What is the current state of the data to achieve these objectives?
- Describe the high road and low road for data collation
- What is the most feasible for NBA 2017?
- Which institutions should be involved in generating the data; who is the custodian?
- What is the most urgent priority for updating – practice, R&D?

Spatial data on rivers is relatively complete; however spatial data on wetlands is substantially incomplete. There was considerable discussion on the need to improving spatial wetland data is a key priority. Some of the key points in relation to spatial wetland data are summarised below.

Currently there is no uniformity in terms of wetland data collection across the provinces, and there is a huge variability in terms of the quality of data. Different wetland maps are used in different organisations. In addition, different tools are being used to gather data, and there is no consensus on which tools to use. Different approaches are being used to classify wetland ecosystem types. For example, KZN has developed their own wetland layer, which has a higher level of accuracy than the national layer, but is still only about 60% accurate. They have used a vegetation-mapping approach to classify wetland types rather than the hydro-geomorphic (HGM) approach which is used nationally.

Many WRC projects include collection of wetland data, and although the intention is for this information to make its way into the National Wetland Inventory housed by SANBI, this does not always happen in practice. Wetland data is also collected through water licencing processes and EIA processes. Currently this data is not being effectively gathered and harnessed to improve the national wetland map.

The question of modelled data vs mapped data was discussed and the group felt that although modelled data is a useful starting point, ground truthing in the field is the desired scenario especially for high priority areas.

Although the resources required to map wetlands in the field is substantial (both time and money), this needs to be contrasted with the cost of losing wetlands, which is likely to be orders of magnitude higher because of their high-value ecological infrastructure functions.

There was discussion on which organisation should be the custodian of the National Wetland Inventory (which includes the national wetland map and classification of wetland ecosystem types). The group confirmed that it is most appropriate for SANBI to continue to play this role, as this is foundational ecosystem data which fits well within SANBI's mandate. DWS is developing a National Wetland Monitoring Programme, for which the design will be completed by August 2015. The National Wetland Monitoring Programme should draw on the underlying spatial wetland data in the National Wetland Inventory, so there needs to be good co-ordination between SANBI and DWS.

A strategy for wetland data collection should be developed, bearing in mind that there are approximately 18 months to improve the data in time to feed it into the NBA analysis. The size of the task is beyond the scope of any one organisation.

Key national players in the generation of wetland data include:

- SANBI, DWS, WRC
- DAFF Land Use and Soil Management does land use and soil mapping – need to find out more about their potential role in wetland mapping
- Agricultural Research Commission – may have a role to play, need to find out more.

The group agreed on a two prong strategy for improving wetland data:

- on the one hand to proactively initiate wetland mapping and ground-truthing in the areas of the country in which wetlands are under most stress;
- on the other hand to improve processes for systematically gathering and collating wetland data that is mapped through ongoing processes such as environmental authorisations and WRC projects, and to ensure that this feeds effectively into the National Wetland Inventory. This is then a long term strategy to systematically update the wetland mapping.

Top priorities for wetland mapping were identified as follows:

- Getting a good presence-absence layer – this is essential and foundational.
- This requires getting agreed methods for mapping wetlands in place as soon as possible. SANBI is in the process of developing a wetland mapping manual and template as part of a WRC project, and will make this available as soon as possible.
- Classification of wetlands into ecosystem types – this will require agreeing on an approach, possibly a nested hierarchical approach that can accommodate both the HGM approach and the veg map approach
- Establishing the National Wetland Mapping and Classification Committee (see discussion below).

Action: Namhla Mbona from SANBI will work towards getting the manual and template for wetland data collection out as soon as possible.

Identification of priorities for the freshwater component of the NBA 2017

Foundational data

- Integrate info and data from different databases
- Take note /incorporate work done by various environmental groups i.e. WFW, etc.
- Feeding provincial data into ntl strategic databases
- More input from local role players, farmer unions
- Ground trothing the sites
- Reference to ground truth information where available
- Standard base map info e.g. coastline, rivers for terrestrial / aquatic interfaces
- To put more efforts on monitoring
- Monitoring of the important biodiversity site
- Maintaining a monitoring and evaluation system on river and wetland condition
- Classifying wetlands
- Getting a relatively confident wetland map

Analysis of data

- Wetland status – conservation status; levels of degradation
- Highlight fish support areas – level of conservation
- Statistical analysis of species loss at National, Provincial and Local
- Revised NFEPA maps
- Establish relationships between ecosystem response to WQ impacts at variable levels
- Identification of causes / drivers of change (what, where, prioritise)
- Adaptation and biodiversity offset
- Clearly indicate how to categorise the river or wetlands in terms of classification
- How effective FEPAs are being used to integrate biodiversity loss

Ecological infrastructure

- Ecological infrastructure message / headline
- Ecological infrastructure mapping (services provided)
- Temporal analysis of ecosystem services loss
- Ground water link
- An assessment of the condition of SWSAs and more headline messages about them
- High water yield areas
- A focus on wetlands as ecological infrastructure
- CBA / cumulative benefit of eco-infra i.e. water quality

Packaging and messaging

- Impacts of the 2020 Forestry Exit Strategy
- Trends should be reported on
- Implications for implementation (so what question)
- Roles and responsibilities of stakeholders
- Clearly indicates method used to determine both wetlands and river conditions (models utilised)
- A clear indication of how the 20% target was derived
- Profiling wetland management Intervention / programmes
- Track degree of sectorial integration of water resource management to prioritisation
- National and smaller scale (catchment / provincial) GIS maps
- Ecological skills (situation analyses and plan)
- Do more on capacity building and training re: implementation
- Scope for involving consultancies as users in discussions?
- Capacity building for the judiciary and police/prosecution

Discussion: Establishing National Wetland Classification Committee and National River Classification Committee

There was strong support for the establishment of a National Wetland Classification Committee, to be established and convened by SANBI as part of the National Ecosystem Classification System. The group agreed that the National Wetland Classification Committee and the National River Classification Committees should be kept separate. In addition the name of the National Wetland Classification Committee was amended to the 'National Wetland Mapping and Classification Committee'..

Membership of the Committee should aim for a combination of geographical coverage and expertise coverage. It does not necessarily need representation from every province. Based on the experience of the National Vegetation Map Committee, it would need a core set of about ten members who attend meetings regularly, with additional people who could be invited to particular meetings. The focus of membership should be on technical expertise rather than management expertise.

It was suggested that the National Wetland Mapping and Classification Committee could feed into the National Ecosystem Classification Committee in relation to technical matters, and could report to the Interdepartmental Committee on Inland Water Ecosystems on any management related issues that arise.

Report back on 2013 FEN themes

Building aquatic capacity within government: This theme relates to the decrease and or absence of aquatic scientific posts in the provincial environmental affairs departments and provincial conservation authorities. John Dini informed the group that DEA had tabled this issue through the MINTECH Working Groups. This matter will also be included in the NWRS process, specifically the skills task team of the Water Sector Leadership Group (WSLG). The group requested that the state of freshwater capacity be included in the NBA 2017. Action: Hermien Roux will liaise with Dean Impson to coordinate the update of the freshwater capacity table. This table will be expanded to include terrestrial and aquatic ecologists.

Parallel process integration: coordinating DEA & DWS processes: Not much to report on under this theme. There is a process underway to integrate parallel processes linked to mining applications, involving DWS, DEA and DMR. This may be expanded to deal with processes beyond mining.

Data management: The 2014 FEN has started to address the issue of data management; by focusing on the NBA and NFEPA.

Communication: As part of SANBI's coordinating role in the FEN, they are able to disseminate information that are of interest to the group, such as the Resource Quality Objectives currently being developed by DWS. Action: The FEN mailing list will be combined with the old NFEPA mailing list to build the freshwater contact database. A suggestion was also made to integrate the SASAQS contact list in the FEN contacts database – Denise Schael from NMMU can assist in this regard.

Possible themes for future FEN workshops

The group agreed to have the 2015 FEN in July. For next year's FEN the group proposed the following focus:

- Progress on wetland mapping, including presenting the strategy for improving the wetland map, as well as the national wetland ecosystem classification system
- An update on the NBA
- Present NWRS chapter 5 implementation plan, with a possible focus on strategic water source areas and plans for improving their management

Annexure 1

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Annexure 2

Freshwater Ecosystem Network

24 - 25 November 2014

Venue: SANBI Pretoria: Herbarium Lecture Hall

Freshwater Component of the National Biodiversity Assessment (NBA) 2017

AGENDA

Monday 24 November: Introductory Workshop		
12:00	Light lunch	
13:00	Welcome & introductions	John Dini
	Introductory technical session <ul style="list-style-type: none"> • Introduction to the National Biodiversity Assessment 2011, with a focus on the freshwater component • Relationship between National Freshwater Ecosystem Priority Areas (NFEPA) & the NBA 2011 • Explanation of key concepts and terminology from the NBA 2011 freshwater component and NFEPA 	Jeanne Nel & Mandy Driver
	Users and uses of the NBA 2011 and NFEPA	All
15:30	TEA	
17:00	Wrap up for the day	
Tuesday 25 November: Looking ahead to the NBA 2017		
08:30	Arrival, registration and tea	
9:00	Welcome, introductions and purpose	John Dini Nadene Slabbert
	Update on National Water Resources Strategy and implementation plan for chapter 5	Magda Ligthelm
10:00	TEA	
10:20	Setting the scene <ul style="list-style-type: none"> • Overview and Introduction to the NBA 	Mandy Driver
	Review and Reflection of the Freshwater Component of NBA 2011 <ul style="list-style-type: none"> • Freshwater-related findings of NBA 2011 • NFEPA and NBA • Impact of NBA in practice 	Mandy Driver & Jeanne Nel
12:30	LUNCH	

13:30	<p>Planning and coordinating of freshwater data for the NBA 2017</p> <p>1. Discussion on priority issues or focus of the freshwater component of NBA 2017</p> <p>2. Data priorities for the freshwater component of the NBA 2017</p> <ul style="list-style-type: none"> • Key foundational data for the NBA (e.g. river types, wetland map, data on ecological condition of rivers and wetlands) <ul style="list-style-type: none"> ○ what is the current status of this data? ○ what are the needs and realistic objectives for NBA 2017? • What should be in place to achieve the objectives? 	Jeanne Nel & Mandy Driver
	DISCUSSION: Establishing National Wetland Classification Committee and National River Classification Committee	John Dini
15:00	TEA	
15:30	<p>Report back on 2013 FEN themes</p> <ul style="list-style-type: none"> • Building aquatic capacity within government • Parallel process integration : coordinating DEA & DWA processes • Data management • Communication 	Working groups
16:30	<p>CLOSE</p> <ul style="list-style-type: none"> • Possible themes for future FEN workshops • Date & venue for next FEN 	John Dini

