Determination of Water Resource Classes and Associated Resource Quality Objectives in the Inkomati Water Management Area

water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

INKOMATI-USUTHU
CATCHMENT MANAGEMENT AGENCY

Background Information Document: February 2015

1. BACKGROUND

The National Water Act (NWA) – Act No. 36 of 1998 – is founded on the principle that the South African Government has overall responsibility and authority over water resource management for the benefit of the public without seriously affecting the functioning of the water resource systems.

PURPOSE OF THISDOCUMENT

- To assist members of the public who will be attending the public meeting on 04 March 2015 to have sufficient background to participate meaningfully.
- To provide an overview of the steps followed to determine the Water Resource Classes and Resource Quality Objectives for the catchments of the Inkomati.
- To present the preliminary results of the process that will soon be gazetted for further public review.

Stakeholders are invited to participate in the process by contributing information at meetings and workshops, or by corresponding with the public participation office or the technical team at the addresses provided below.

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In order to achieve this objective, Chapter 3 of the NWA provides for the protection of water resources through the implementation of Resource Directed Measures (RDM) which includes the classification of significant water resources, setting the Reserve and Resource Quality Objectives (RQOs).

The Chief Directorate: Water Ecosystems of the Department of Water and Sanitation (DWS) is responsible for the implementation of RDM in terms of Regulations (R810) for the establishment of the Water Resource Classification System (WRCS) that was published in Government Gazette No 33541 on 17 September 2010 to ensure that a balance is sought between the need to protect and sustain water resources on one hand and the need to develop and use them on the other.

The DWS has identified the need to undertake the classification of significant water resources (rivers, wetlands, groundwater and lakes) and the determination of RQOs in the catchments of theInkomati in accordance with the WRCS.The process has reached the point where preliminary results are shared with stakeholders in preparation for the gazetting process. The process was initiated in April 2013 and gazetting is expected to be initiated in due course. The objective of the process is to set the water resource classes (WRCs), commonly known as Management Classes (MCs), andRQOs for the catchments of the Inkomati.

2. WHAT ARE THE WRCS AND RQOS?

The WRCS is a set of guidelines and procedures for determining the desired characteristics of a water resource, and is represented by a water resource class (WRC). The WRC outlines the attributes society requires of different water resources and reflects the importance given to protection and/or development.

The actual process of applying the WRCS guidelines and procedures in order to establish the WRC is called the Classification Process. The Classification Process is a consultative process that allows stakeholders to negotiate a desired WRC.The outcome of the Classification Process will be the approved WRC by the Minister or her delegated authority which will be binding on all authorities or institutions when exercising any power, or performing any duty under the NWA. Water resources must be classified into one of the classes as tabled on page 2.

The RQOs are numerical and/or narrative descriptive statements of conditions which should be met in the receiving water resource, in terms of resource quality, in order to ensure that the water resource is protected. The purpose of the RQOs is to establish clear goals relating to the quality of the relevant water resource. The NWA stipulates that in determining the RQOs a balance must be sought between the needs to protect and sustain the water resources, and the need to develop and use them. The RQOs are intended to give effect to the Class determined in each water resource.

Table 1: Water Resource Class descriptions

Classes	Description of use	Dominant Ecological Categories (ECs *)
Class I	**Minimally used -** water resource is minimally used and the overall ecological condition of that water resource is minimally altered from its pre-development condition	**A and/or B**
Class II	**Moderately used -** water resource is one which is moderately used and the overall ecological condition of that water resource is moderately altered from its pre-development condition	**C**
Class III	**Heavily used -**water resource is one which is heavily used and the overall ecological condition of that water resource is significantly altered from its pre-development condition	**D**

*The Ecological Category (EC) - means the assigned ecological condition to a water resource in terms of the deviation of its biophysical components from a pre-development condition. The scale is A (near natural) to F (critically modified).

3. PURPOSE OF THE STUDY

The purpose of this study is to coordinate the implementation of the WRCS in order to determine a suitable WRC for therelevant water resources; and to determine RQOs using the Departmental Procedures to Develop and Implement RQOs.
The determination of the WRC of the identified water resources in the study area will essentially describe the desired condition of the resource, and conversely, the degree to which it can be utilised by incorporating the economic, social and ecological goals of the users and stakeholders in the catchment area.

4. AN OVERVIEW OF THE STUDY AREA

The spatial extent for the study includes the primary drainage region X, which includes the Komati, Crocodile East and Sabie/Sand Rivers.The Inkomati is an international river basin, and it borders Mozambique in the east and Swaziland in the south-east. All the rivers in the Inkomati flow through Mozambique to the Indian Ocean. The Inkomati is located in the north-eastern part of South Africa in the Mpumalanga Province. The area is defined by the following three distinct catchments: Komati River, Crocodile (East) River, Sabie River catchments.

A special situation is presented by the Komati River, the most southern tributary of the Inkomati River, which rises in South Africa and flows into Swaziland, then re-enters South Africa where it is joined by the Crocodile River at the border with Mozambique, before flowing into Mozambique as the Inkomati River. The Kruger National Park is partially located in the Sabie and Crocodile catchments.

Economic activity is mainly focused on irrigation and afforestation, with related industries and commerce, and a strong eco-tourism industry. Several major dams, such as Nooitgedacht and Vygeboomhave been constructed in the Inkomati. The Komati River is highly regulated, while the Crocodile and Sabie/Sand Rivers are less regulated by dams. A number of important canal systems that distribute water to irrigators in the Crocodile, Sabie and Sand River catchment also exist.

5. STUDY APPROACH AND PROGRESS

The process of determining classes and RQOs is both technical and consultative. The availability of data and information from past studies was considered in defining the activities, tasks and resources for the execution of the study. The most important source was the recently completed high confidence Reserve Determination Studies in the Inkomati WMA. The process followed in this study, was alsocognisant of and aligned to the systems already in place at the IUCMA.

Key aspects that were assessed during the study to determine the WRC are the following:

- The Status Quo of the study area was determined. This entails a description of the ecological, economical and ecosystem services of the study area. The description was provided in context of the hydrology of the river system, geohydrology and its current water resource infrastructure and management. This information highlighted issues and challenges in the catchment as well as providing an indication of the ecological and environmental importance of different areas. With this information available, 34 integrated units of analysis (IUAs) were delineated and accepted by stakeholders (see Figure 2). The information also provided stakeholders with sufficient background to allow them to envisage their future 'vision' of the different IUAs.
- Ecological Water Requirements were described for river systems. The information was used for the required models and different scenarios which can include changes to present operation of the system and/or future developments. For future developments it was required to understand the implications for water availability, stakeholders' requirement, ecological health of the system and changes to ecosystem services. That led to recommendations on the WRCs for each IUA which will be presented for discussion to stakeholders. Stakeholders will then be able to understand the consequences of their original vision and how it could impact on all users and the ecological health of the system. In all the catchments, the recommendation is to eithermaintain or improve thepresent ecological state (PES).
- RQOs were also developed to describe the draftwater resource classes. Some RQOs are numerical, and others descriptive; all depending on baseline information available. The numerical RQOs will for example be used in monitoring which is very important to see that the WRCs are being maintainedand improvement within these WRCs being achieved where necessary.

6. STUDY OUTCOMES, RECOMMENDATIONS AND IMPLICATIONS

The formulation of recommended WRCs consists of a number of steps which consider relevant information to lead to a balance between protection and use of a water resource to sustain socio-economic activities. One of the steps towards the determination of WRCs is the identification and evaluation of operational scenarios. Various scenarios were identified and evaluated and the consequences of these scenarios in terms of ecological, economic and ecosystem services were determined. The recommendations as well as the resulting WRCs are summarised below.The draft WRC is either the maintenance or improvement of the PES. Improvement of the PES, i.e. the recommended ecological category (REC), is based on whether it is realistic to improve the ecological condition from the present state taking into consideration the socio-economic implications.The preferred scenario for each system is described hereunder:

i) Komati System

IUA(EWR site)	PES[1]	REC[2]	Draft WRC
X1-1	II	**II**	**II**
X1-2	II	**II**	**II**
X1-3 (K1)	II	**II**	**II**
X1-4 (G1)	III	**III**	**III**
X1-5 (K2)	II	**I**	**I**
X1-6 (T6)	II	**I**	**I**
X1-7	II	**I**	**II**
X1-8 (L1)	III	**II**	**III**
X1-9 (K3)	III	**III**	**III**
X1-10	XXX[3]	**III**	**III**

- Maintain the current ecological state and operation of the Komati and Lomati Rivers.
- Institute measures (non flow-related) to achieve the REC in tributaries of the main rivers.

Implications: there are no implications to the users. The REC in the Lomati River is not achieved under the current situation and the ecological status quo is maintained.

[1] present ecological state [2]recommended ecological category. [3] does notcomply with the criteria for at least Class III

ii) Crocodile System

IUA	PES	REC	Draft WRC
X2-1	II	**II**	**II**
X2-2	II	**II**	**II**
X2-3	I	**I**	**I**
X2-4	II	**II**	**II**
X2-5	I	**I**	**I**
X2-6	II	**I**	**II**
X2-7	II	**I**	**I**
X2-8	XXX	**II**	**II**
X2-9	II	**I**	**II**
X2-10	II	**II**	**II**
X2-11	II	**I**	**II**
X2-12	II	**II**	**II**
X2-13	I	**I**	**I**

- The current situation is recommended in the main rivers (Elands, Crocodile and Kaap Rivers). The scenario includes the release of a portion of the ecological flow requirements that were determined to maintain the PES.
- Institute measures (non flow-related) to achieve the REC in tributaries of the main rivers.

Implications: No implication to users as this scenario represents the current baseline. The REC in the downstream Crocodile River will not be met and the scenario will in the long term possibly degrade the Present Ecological State.

iii) Sabie/Sand System

IUA	Catchment	PES	REC	Draft WRC
X3-1	Sabie	II	**I**	**I**
X3-2	Sabie	II	**I**	**I**
X3-3	Sabie	I	**I**	**I**
X3-4	Sabie	III	**III**	**III**
X3-5	Sabie	I	**I**	**I**
X3-6	Sabie	I	**I**	**I**
X3-7	Sand	III	**II**	**II**
X3-8	Sand	II	**II**	**II**
X3-9	Sand	I	**I**	**I**

- Maintain the current ecological state and operation of the system.
- Institute measures (non flow-related) to achieve the REC in the Sabie River upstream of the KNP and various tributaries.
- May include the reinstatement of forestry in the Sand catchment.

Implications: No implication to users as this scenario represents the current baseline. This scenario will not however cater for an increase in domestic use in the Sabie River in the future. The REC in the Mutlumuvi River is not achieved under the current situation and the ecological status quo is maintained in this river.

The preferred scenarios were used to select the draft WRCs. A Report on the WRC selection process and its consequences is available for stakeholder review. The WRC presented is a draftWRC and only after the gazetting process (for public comments) will the Minister of Water and Sanitation finally decide on the status of the WRC.

7. RESOURCE QUALITY OBJECTIVES

Operational scenarios, WRCs and RQOs are inherently linked as operational scenarios (Sc) inform the WRC, and RQOs define and/or describe the WRC (Figure 1).

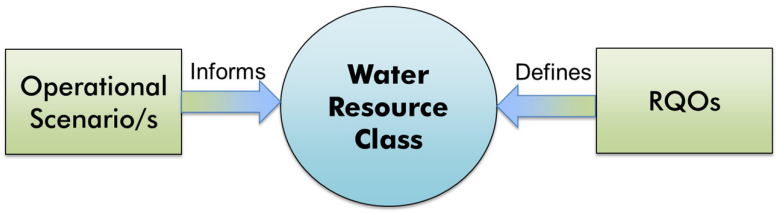


Figure: 1 Links between RQOs and the Water Resource Class and operational scenarios

RQOs capture the Water resource class of the Classification System and the ecological needs determined in the Reserve into **measurable management goals** that give direction to resource managers as to how the resource needs to be managed. This includes for surface and groundwater resources. Once the WRCs have been recommended, RQOs were developed to describe the WRCs. RQOs are numerical and/or descriptive statements about the biological, chemical and physical attributes that characterise a resource for the level of protection defined by its Class; all depending on the extent of data available. The numerical RQOs will be used in monitoring which is very important to see that the WRCs are being maintained and improvement within these WRCs being achieved where necessary. Different level (in terms of detail) RQOs were set for Resource Units. The biological indicators and driving variables for water quality have been identified, and the narrative and/or numerical RQOs determined for rivers, wetland and groundwater. The RQOs were provided and discussed at the third PSC meeting. These recommendations are available for comment and will also be gazetted for further comments and approval.

8. STAKEHOLDER ENGAGEMENT

Public Participation: Stakeholders were invited to become involved since the inception of this study. The first Public Meeting was held in June 2012 at Bundu Lodge, White River. The aim has been to communicate regularly with stakeholders that represent relevant government departments on national and provincial level; municipalities; agriculture (Irrigation Boards, agricultural unions); mining and industry; conservation organisations; relevant parastatals (e.g. Eskom); community representatives; and civil society.

Project Steering Committee (PSC): A Project Steering Committee (PSC) which was established for the duration (two years) of this project provided oversight, strategic advice and guidance to the classification process. The PSC comprised representation from all sectors and major water users. Three meetings,at different milestones of the study, were held with the PSC members to obtain contributions from various sectors.

Technical Task Group (TTG): Two TTG meetings were held in October 2013 and August 2014. The purpose of the first TTG meeting was to discuss the socio-economic component of the classification process. The second TTG meeting was held in order to discuss river habitat and biota RQOs and user water quality RQOs.

Sectormeetings:The mining sector requested a meeting to discuss the water quality component of the classification and RQOs study and to clarify the link between RQOs and source directed controls such as license conditions and discharge standards. The meeting was held on 16 October 2013.

On-going consultation with stakeholders: Stakeholders will continue to be informed of progress with the study through newsletters/information documents and will be asked for their inputs on an ongoing basis. The DWS website(**http://www.dwa.gov.za/rdm/WRCS/default.aspx**)will also be used for the publishing of information regarding this study.Should you wish to review any documents related to this study, you are welcome to access them on the DWS website or to contact the relevant DWS managers.

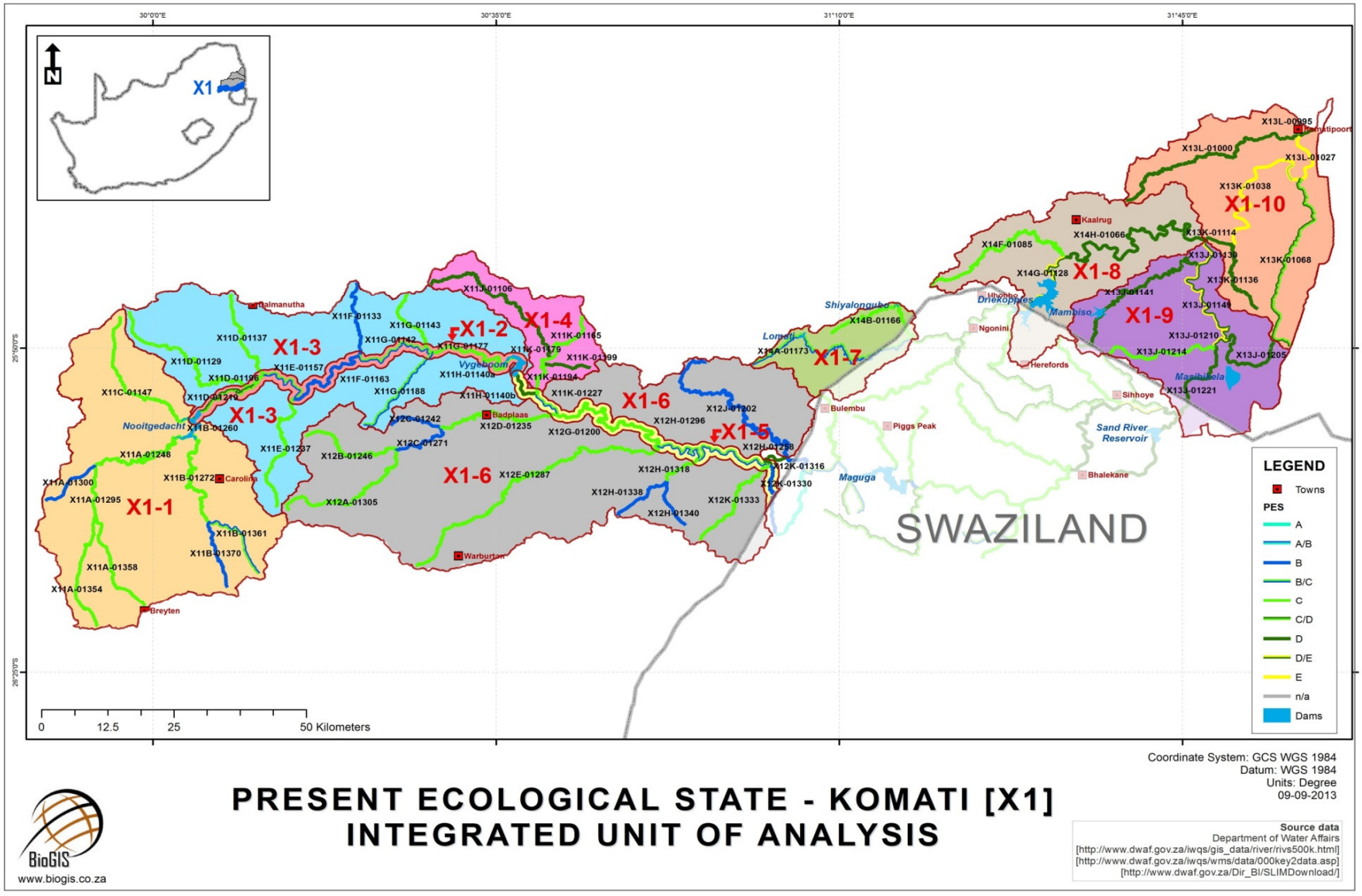
9. WAY-FORWARD

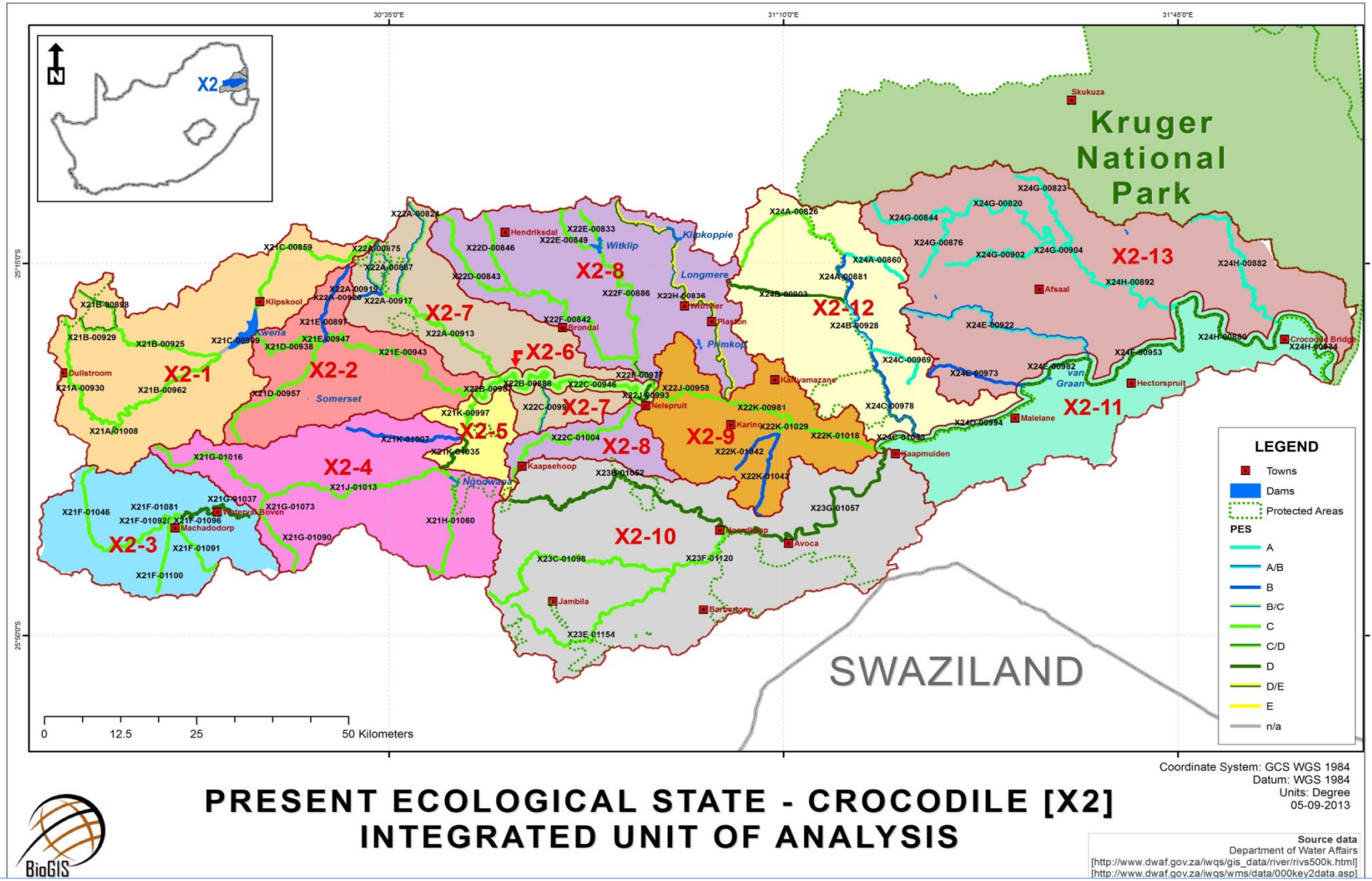
After the consultation at the public meeting on 4 March 2015 (see below), WRCs and RQOs will be gazetted for public comments for a period of 60 days. Stakeholders will be invited to submit their written comments. Stakeholder comments will be addressed and written replies will be sent to commentators. Revised WRCs and RQOs will then be submitted for the Minister's approval.

Public Meeting

You are invited to attend a public meeting on Wednesday, 04 March 2015 from 08:30 to 13:30 at Greenway Woods to discuss the proposed Water Resource Classes and the Resource Quality Objectives for the catchments of the Inkomati which will be gazetted for further public comment. Please register to attend the meeting by contacting: Anelle Lötter / SibongileBambisa on tel: (012) 667-4860 or email sibongile@jaws.co.za or anelle@jaws.co.za or Ms MohlapaSekoele, Department of Water and Sanitation on tel: (012) 336-8329 or email SekoeleM@dwa.gov.za

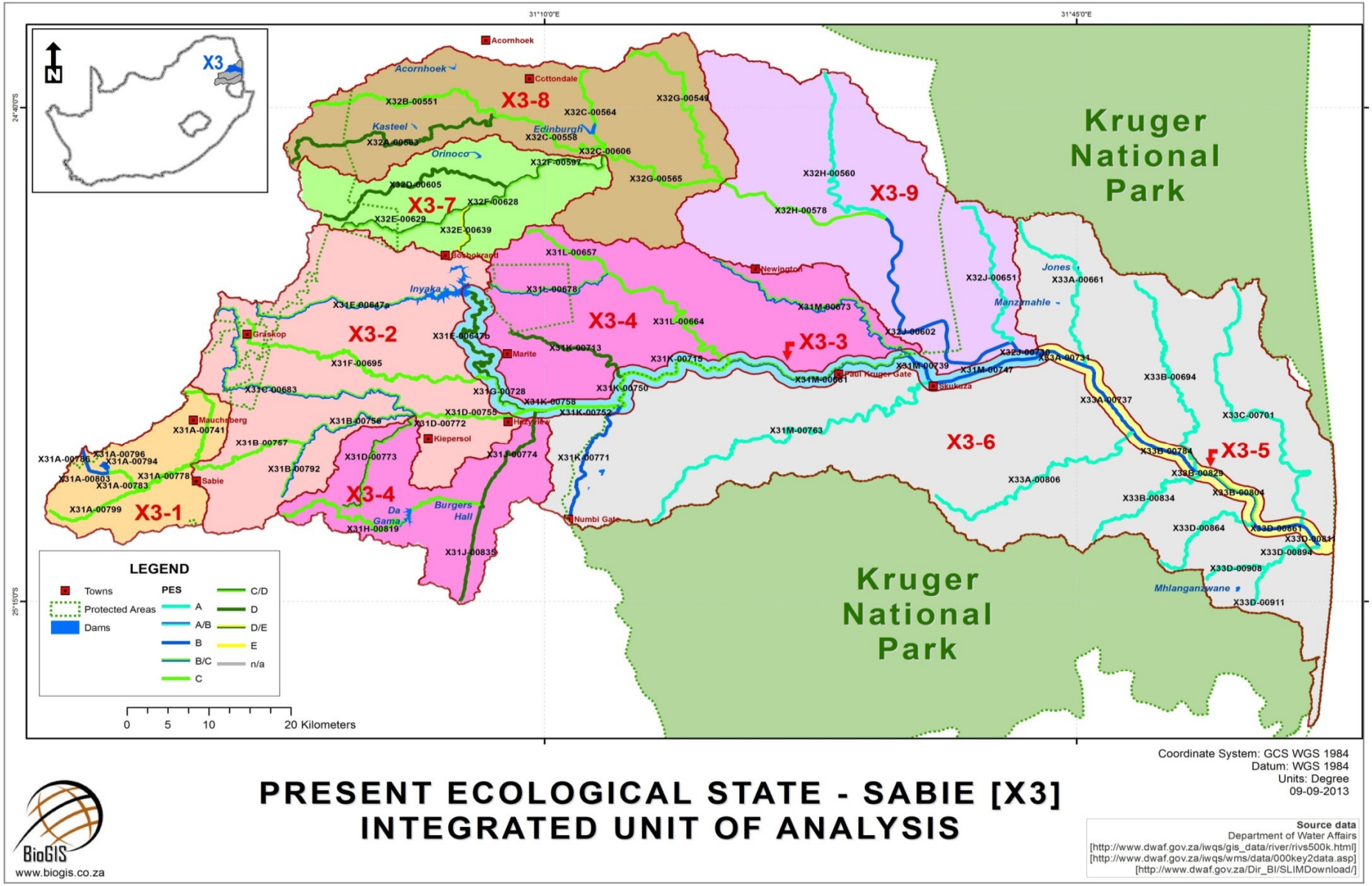
Figure 2:Maps showing Integrated Units of Analysis (IUA) – also see some definitions for terminology frequently used





Significant Water Resources: Water resources that are deemed to be significant from a water resource use perspective, and/or for which sufficient data exist to enable an evaluation of changes in their ecological condition in response to changes in their quality and quantity of water. Water resources are deemed to be significant based on factors such as, but not limited to, aquatic importance, aquatic ecosystems to protect and socio-economic value.

Reserve: The quantity and quality of water needed in a water resource (e.g. estuaries, rivers, lakes, ground water and wetlands) to sustain basic human needs and protect aquatic ecosystems to ensure ecologically sustainabledevelopment and utilisation of a water resource.



Ecological Water Requirements (EWR): The flow patterns (magnitude, timing and duration) and water quality needed to maintain a riverine ecosystem in a particular condition. This term is used to refer to both the quantity and quality components. The EWRs as determined by the Comprehensive Reserve study of 2001 will be applied in this study.

Integrated units of analysis (IUAs): The basic unit of assessment for the classification of water resources. The IUAs incorporates socio-economic zones and is defined by catchment area boundaries.