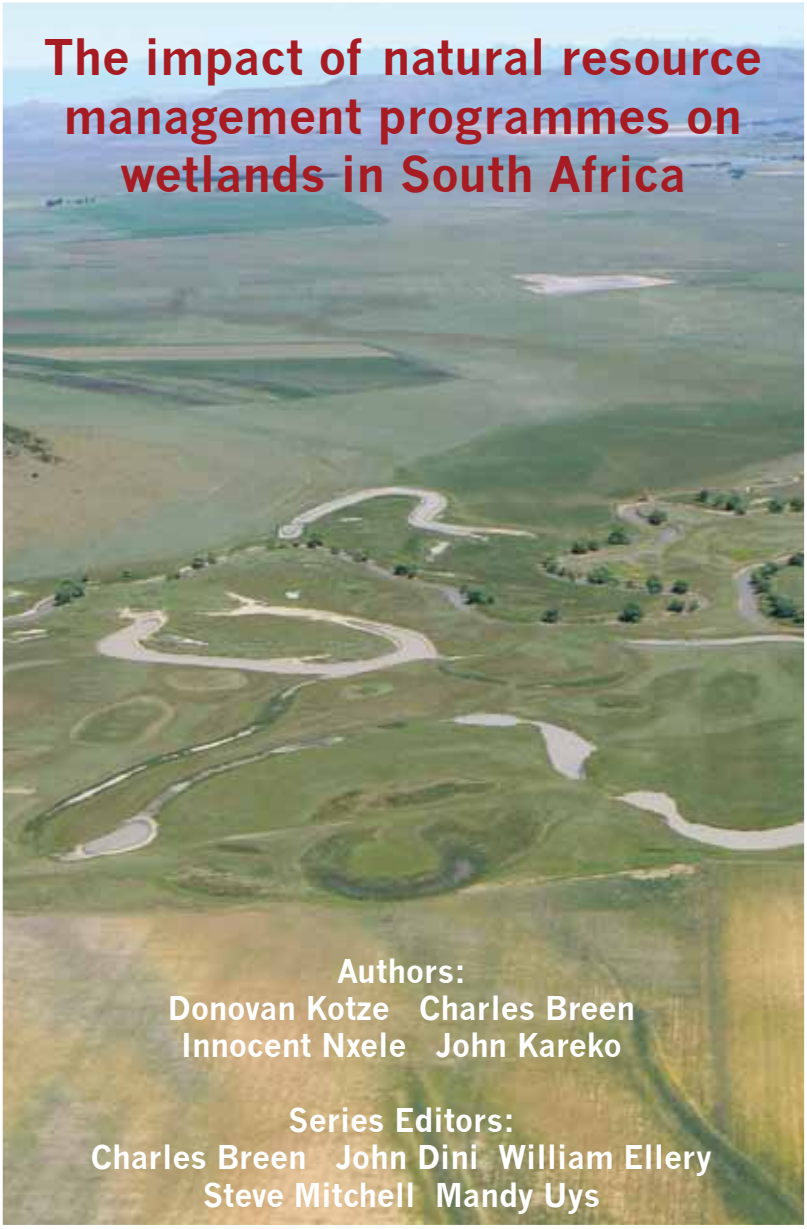
Wetland Management Series

WET-Management Review

The impact of natural resource management programmes on wetlands in South Africa



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Environmental Affairs and Tourism
Water Affairs and Forestry
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UNIVERSITY OF KWAZULU-NATAL

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Water Research Commission

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WRC Report TT 335/09
March 2009

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Front cover: The Mzimvubu River floodplain on the Cedarville Flats, in the Eastern Cape near its border with KwaZulu-Natal. The Mzimvubu River meanders extensively over the 'Flats', forming numerous oxbow lakes through meander cutoff (pictured). The photograph was taken during a Bateleurs-sponsored flight over the Cedarville Flats in November 2007, in order to plan for future research. The flight was piloted by Barry De Groot.
Photograph: Suzanne Grenfell

Inside front cover: Boneberg's frog (*Natalobatrachus bonebergi*), commonly known as Ngoye frog, is a threatened endemic species along the coastal region of KZN.
Photograph: Errol Douwes

Preface: Background to the *WET-Management* Series

The need for wetland rehabilitation in South Africa is compelling: loss and degradation of wetlands have been great and national policy and legislation provide clear direction and support for rehabilitation. However, rehabilitating wetlands is often complex because wetlands and their links with people are complex (e.g. through the ways that people use wetlands and the different benefits that people receive from the ecosystem services that wetlands supply). Thus a series of tools has been developed to assist those wishing to undertake wetland rehabilitation in a well-informed and effective way (Box 1P).

These tools were developed as part of a comprehensive nine-year research programme on wetland management which was initiated in 2003 by the Water Research Commission (WRC) and a range of partners that examines wetland rehabilitation, wetland health and integrity and the sustainable use of wetlands. The rehabilitation component, which was co-funded by the WRC and the Department of Environmental Affairs and Tourism, through the Working for Wetlands (WfWetlands) programme, was prioritised to take place first because of the need to provide a firm, scientific and technical foundation for the extensive rehabilitation work already under way.

The Working for Wetlands programme is a national initiative that seeks to promote the protection, rehabilitation and wise use of wetlands in South Africa. As part of this initiative, WfWetlands has a national programme for the rehabilitation of wetlands, including a structured process of prioritising rehabilitation sites and supporting their rehabilitation. At the same time, however, it is acknowledged that sustainable use of wetlands in the long term can be achieved only through the dedicated participation of civil society, whose wetland interests may have a strong local focus. Thus the tools have been developed in such a way that they can be applied outside of the Working for Wetlands programme, and without having to engage the process of national or provincial prioritisation should the user not desire to do so. Even so, the tools encourage local wetland rehabilitation efforts to strengthen links with the national initiative and the opportunity these provide for fruitful partnerships.

The series consists of a roadmap, two background documents, eight tools and an evaluation of the success of six individual projects (Box 1P). From Table 1P it can be seen that some of the tools (e.g. *WET-RehabMethods*) are designed to be used by those dealing specifically with wetland rehabilitation and its technical requirements. Other tools (e.g. *WET-Health*) have much wider application such as assessing impacts associated with current and future human activities in Environmental Impact Assessments (EIAs) or assessing the Present Ecological State (PES) of a wetland in an Ecological Reserve Determination (ERD).

One can locate the tools in terms of some basic 'who', 'what', 'where' and 'how' questions that any team undertaking wetland rehabilitation should be asking (Table 2P). Furthermore, each of the tools can be used individually, but there are close links between them (Figure 1P).

Box 1P: Overview of the *WET-Management* Series

The series includes documents that provide background information about wetlands and natural resource management, tools that can be used to guide decisions around wetland management, and an evaluation of rehabilitation outcomes in a number of case studies.

WET-Roadmap

WET-Roadmap provides an introduction to the *WET-Management* tools and includes:

- a brief outline of the documents and tools in the *WET-Management* series and how they inter-relate
- an index of wetland rehabilitation related terms
- reference to specific sections in the relevant tools.

WET-Origins

WET-Origins describes the remarkable geological and geomorphological processes that give rise to wetlands in South Africa, and provides a background description of:

- the geology, geomorphology, climate and drainage of southern Africa
- an introduction to wetland hydrology and hydraulics
- geomorphic controls on different wetland types
- wetland dynamics due to sedimentation and erosion.

It incorporates this understanding into a methodology that can be used to help develop insight into the hydrological and geomorphological factors that govern why a wetland occurs where it does, which is useful when planning rehabilitation.

WET-ManagementReview

WET-ManagementReview has four parts:

1. An assessment of effectiveness at programme level, including:
   - a national overview of land-uses affecting the status of wetlands and the institutional environment that affects wetlands.
   - an overview of five natural resource management programmes affecting wetlands and their impact in different land-use sectors; Working for Wetlands, Working for Water, LandCare, the Crane Conservation Programme of the Endangered Wildlife Trust, and the Mondi Wetlands Programme.
2. An assessment, using the *WET-EffectiveManage* tool, of the management effectiveness of 21 wetland sites in a variety of different land-use and land-tenure contexts.
3. An assessment of stakeholder participation in wetland rehabilitation at six wetland sites.
4. A framework for assessing the effectiveness of collaboration between partners, described and applied to a site where a rehabilitation project has been under way for several years.

WET-OutcomeEvaluate

WET-OutcomeEvaluate is an evaluation of the rehabilitation outcomes at six wetland sites in South Africa, including an evaluation of the economic value of rehabilitation. The six sites are:

1. Killarney Wetland
2. Manalana Wetland
3. Kromme River Wetland
4. Dartmoor Vlei
5. Kruisfontein Wetland
6. Wakkerstroom Vlei.

WET-RehabPlan

WET-RehabPlan offers a process that can be followed to develop comprehensive wetland rehabilitation plans. It has three main elements:

- Introduction to rehabilitation, planning and stakeholder involvement.
- General principles to follow in planning wetland rehabilitation.
- Step-by-step guidelines for undertaking the planning and implementation of wetland rehabilitation at a range of scales from national/provincial to catchment to local. It directs the user to the right tools and sections at appropriate points in the rehabilitation process.

Good planning ensures a rational and structured approach towards rehabilitation as well as a clear understanding of the reasons for rehabilitation, the actions and interventions required, and the benefits and beneficiaries.

WET-Prioritise

WET-Prioritise helps to identify where rehabilitation should take place once the objectives of rehabilitation are identified. It works at three spatial levels. At national and provincial level an interactive GIS modelling tool assists in identifying priority catchments by evaluating a range of scenarios based on different combinations of 13 socio-economic and bio-physical criteria (e.g. biodiversity priority areas, high poverty areas). Once a catchment is selected, the tool helps to identify areas for rehabilitation within that catchment. Finally, individual wetlands are selected based on the predicted cost-effectiveness and sustainability of rehabilitation.

WET-Prioritise provides step-by-step guidelines applicable at all three spatial scales, including:

- identifying objectives and an appropriate scale.
- developing prioritisation criteria.
- applying the criteria, usually in a two step process of rapidly screening all candidate sites to arrive at a preliminary set of sites, from which individual priority sites are selected.

Three case examples of prioritisation are described.

WET-Legal

WET-Legal presents South African legislation that is relevant to wetland rehabilitation, including the Conservation of Agricultural Resources Act (CARA), National Environmental Management Act (NEMA), and National Water Act (NWA), as well as relevant international agreements such as the Ramsar Convention on Wetlands. *WET-Legal* lists the environmental impacts potentially associated with typical wetland interventions and the legislative provisions that apply to each of these impacts. It also covers laws compelling rehabilitation and the legal responsibilities of different parties involved in rehabilitation.

WET-EcoServices

WET-EcoServices is used to assess the goods and services that individual wetlands provide, thereby aiding informed planning and decision-making. It is designed for a class of wetlands known as palustrine wetlands (i.e. marshes, floodplains, vleis or seeps). The tool provides guidelines for scoring the importance of a wetland in delivering each of 15 different ecosystem services (including flood attenuation, sediment trapping and provision of livestock grazing). The first step is to characterise wetlands according to their hydro-geomorphic setting (e.g. floodplain). Ecosystem service delivery is then assessed either at Level 1, based on existing knowledge or at Level 2, based on a field assessment of key descriptors (e.g. flow pattern through the wetland).

WET-Health

WET-Health assists in assessing the health of wetlands using indicators based on geomorphology, hydrology and vegetation. For the purposes of rehabilitation planning and assessment, *WET-Health* helps users understand the condition of the wetland in order to determine whether it is beyond repair, whether it requires rehabilitation intervention, or whether, despite damage, it is perhaps healthy enough not to require intervention. It also helps diagnose the cause of wetland degradation so that rehabilitation workers can design appropriate interventions that treat both the symptoms and causes of degradation. *WET-Health* is tailored specifically for South African conditions and has wide application, including assessing the Present Ecological State of a wetland for purposes of Ecological Reserve determination in terms of the National Water Act, and for environmental impact assessments. There are two levels of complexity: Level 1 is used for assessment at a broad catchment level and Level 2 provides detail and confidence for individual wetlands based on field assessment of indicators of degradation (e.g. presence of alien plants). A basic tertiary education in agriculture and/or environmental sciences is required to use it effectively.

WET-EffectiveManage

WET-EffectiveManage provides a framework that can be used to assess management effectiveness at individual wetlands based on 15 key criteria (e.g. the extent to which a regularly reviewed management plan is in place for the wetland). A scoring system is provided for rapidly assessing the criteria. This tool is Chapter 2 in the *WET-ManagementReview* manual.

WET-RehabMethods

WET-RehabMethods is used to guide the selection and implementation of rehabilitation methods that are appropriate for the particular problem being addressed and for the wetland and its catchment context. It provides detailed practical rehabilitation guidelines for inland palustrine wetlands and their catchments, and focuses particularly on wetlands associated with natural drainage networks. It can be adapted to meet specific needs. Some aspects of the tool require high levels of civil engineering expertise, but it is designed primarily for rehabilitation workers who have completed training in soil conservation, life sciences or engineering at a diploma level or higher, and who have practical field experience.

WET-RehabMethods includes the following:

- Key concepts relating to wetland degradation, particularly those

resulting from erosion.

- Guidelines for the selection of an appropriate type of rehabilitation intervention (including both 'soft' and 'hard' engineering options).
- Detailed guidance, provided for designing a wide variety of intervention types (e.g. determining an adequate spillway to account for runoff intensity).
- Detailed guidance provided for the implementation of the different intervention types.

WET-RehabEvaluate

WET-RehabEvaluate is used to evaluate the success of rehabilitation projects, and is designed with the understanding that monitoring and evaluation are closely tied to planning, which, in turn, should accommodate monitoring and evaluation elements. *WET-RehabEvaluate* provides the following :

- Background to the importance of evaluation of wetland rehabilitation projects.
- Step-by-step guidelines for monitoring and evaluation of rehabilitation projects, both in terms of project outputs and outcomes. The outcomes are based on system integrity and the delivery of ecosystem services, and results from *WET-Health* and *WET-EcoServices* are therefore included. The guidelines include review project objectives, identify performance indicators and standards, develop and implement a monitoring and evaluation plan, and evaluate and report on performance.

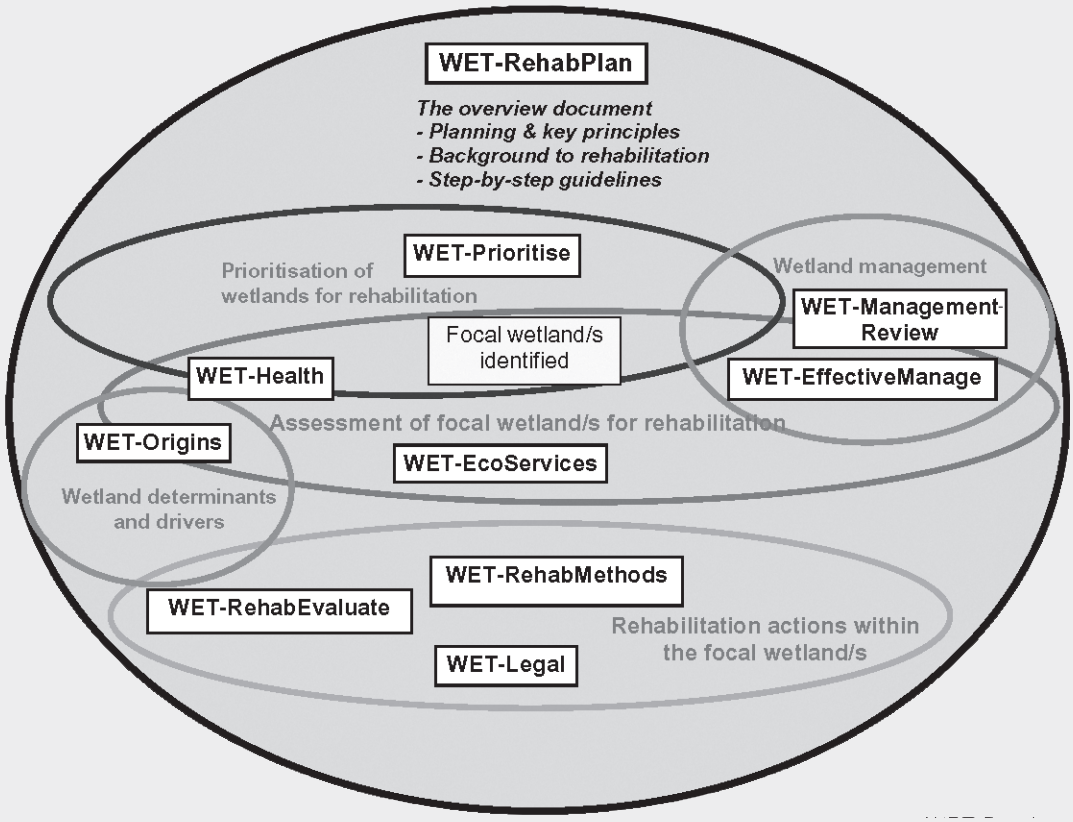

Figure 1P: How do the *WET-Management* tools relate to each other in a rehabilitation context?

Table 1P: Likely relevance of the background reading and tools in the *WET-Management* series to a variety of different potential uses

Potential users	*WET-Origins*	*WET-Management - Review*	*WET-RehabPlan*	*WET-Prioritise*	*WET-Effective-Manage*	*WET-Legal*	*WET-Rehab-Methods*	*WET-Eco-Services*[1]	*WET-Health*[2]	*WET-Rehab-Evaluate*
Rehabilitation planning - wetland specialist										
Rehabilitation planning - engineer		Part 1	Step 5							
Rehabilitation programme coordination - *national*										
Rehabilitation programme coordination - *provincial*										
Rehabilitation implementation			Step 5							
Impact assessment		Part 1						Level 1	Level 2	
Wetland management										
Ecological Reserve Determination - DWAF officials & consultants		Part 1						Level 1	Level 2	
Catchment planners - CMAs and others		Part 1								
Broad-scale biodiversity conservation planning		Part 1								

The tool is likely to have some relevance

The tool is likely to have a very high level of relevance

[1] *WET-EcoServices* is of particular relevance in determining the Ecological Importance and Sensitivity (EIS) of a wetland.

[2] *WET-Health* is of particular relevance ino determining the Present Ecological State (PES) of a wetland.

CMA = Catchment Management Agency
DWAF= Department of Water Affairs and Forestry

Table 2P: Rehabilitation-related questions typically posed at different spatial levels, and the tools most relevant to assisting the user in answering each question

Common questions	Tool/s likely to be relevant in addressing the question
Questions that might typically be asked at the national or regional level	
What is causing the degradation of wetlands?	*WET-Health* (Level 1) & *WET-ManagementReview*
Which are the most important wetlands?	*WET-Prioritise* & *WET-EcoServices* (Level 1)
Which wetlands should we rehabilitate?	*WET-Prioritise*
How should wetland rehabilitation be integrated within broad-scale catchment management?	*WET-Prioritise* & Dickens *et al*. (2003)
Questions that might typically be asked at the local level	
How effectively is the wetland being managed?	*WET-EffectiveManage*
What is causing the degradation of the wetland?	*WET-Health* (Level 2)
Is the wetland in need of rehabilitation?	*WET-Health* (Level 2) & *WET-Origins*
How do I decide what rehabilitation interventions will be appropriate for meeting my rehabilitation objectives?	*WET-RehabPlan* (Step 5F) & *WET-RehabMethods*
What are specific technical considerations I must make when designing a rehabilitation intervention?	*WET-RehabMethods*
Will the planned project be legally compliant?	*WET-Legal*
How do I evaluate my rehabilitation project?	*WET-RehabEvaluate*
Who should be involved in the rehabilitation project?	*WET-RehabPlan*
How do I align my rehabilitation project with catchment-, regional- or national-level programme/s?	*WET-RehabPlan* & WfWetlands Strategy (Working for Wetlands, 2005)

The National Water Act defines wetlands as:

'...land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which in normal circumstances supports or would support vegetation typically adapted to life in saturated soils.'

This is the definition used by the *WET-Management* Series.

Summary of *WET-ManagementReview*

Although there are several Natural Resource Management Programmes (NRMPs) in South Africa that deal with wetland issues, there has been little evaluation of the impacts of these programmes on the management and rehabilitation of wetlands. There has also been little attention given to how effectively individual wetlands are being managed, and how effectively the various organizations involved collaborate at these sites. To address this, an investigation was undertaken consisting of four main parts. Part 1 broadly examines the impact of the NRMPs which promote the conservation and rehabilitation of wetlands. Part 2 presents the framework that was used for assessing management effectiveness and applies this framework to 21 individual wetlands. Part 3 examines in further detail six of the 21 wetlands, and focuses on the relationship between participation in rehabilitation and the long-term sustainability of natural resource management. Finally, Part 4 presents a framework for assessing how effectively various organizations and programmes collaborate, and applies this framework to one of the 21 sites. Thus, in progressing from Part 1 to Part 4, the selection of issues and individual sites becomes increasingly focused.

Part 1 begins with an overview on the principal land uses affecting the health status of wetlands in South Africa in order to provide the context of the remaining assessment. Next, an assessment is provided of the impact of NRMPs on the status of South African wetlands and how this impact differs across various land-use and tenure sectors and the potential key factors that determine the impact of these programmes in the various sectors. Three government-led programmes, Working for Wetlands (WfWetlands), Working for Water (WfWater) and LandCare, South Africa, and two NGO-led programmes, Mondi Wetlands Project (MWP) and the Crane Conservation Programme of the Endangered Wildlife Trust (EWT) and its crane conservation partners, are examined.

Forestry stands out as the sector that has demonstrated the most marked improvement with regard to its management of wetlands, and this is largely as a result of the extensive withdrawal of plantations from wetlands. It is anticipated that it is going to be more difficult to effect widespread change in some of the other sectors (e.g. sugar cane and subsistence farming) because of there being more actors who are less connected, and there is also less external pressure for change.

In Part 2 of the investigation, a management effectiveness framework, called *WET-EffectiveManage*, is described. *WET-EffectiveManage* consists of 15 questions each addressing an important element of management effectiveness (e.g. mechanisms for controlling inappropriate land-uses). For each of the questions, the respondents assign a score of 0, 1, 2 or 3 based on which of the criteria descriptions best fits the situation at the site being assessed. In addition, for each of the questions the respondent is invited to provide additional comment. The questionnaire, which includes an explanation of each question and its underlying assumptions, aims to be as transparent as possible and to promote learning by both the researcher and the respondents as they work through the questionnaire together.

WET-EffectiveManage was applied to 21 wetland sites in South Africa. A stratified sampling approach was used so as to include a diversity of land tenure contexts (private, communal tribal land and formally protected government

land) and was drawn from 10 different provinces. A common feature of all the sites was that there had been some form of intervention by an NRMP to improve the state of the wetland, and most of the sites had undergone some form of rehabilitation to improve their physical state. Respondents who had a good knowledge of the site were requested to complete two questionnaires, one for the situation prior to the intervention and one for the situation after the intervention.

In general, an improvement in the management effectiveness of the sites was observed, although this was less apparent in communal-use contexts where natural resource governance structures were weakened, and pressure on natural resources and complex social dynamics constrained the management effectiveness. Across all contexts there were some elements that consistently scored relatively low, and these included protection of the site, an actively-used management plan, allocation of resources for management, and monitoring.

The results of the investigation highlight areas where NRMPs need to improve their specific interventions (such as providing greater facilitation to local landholders for developing an easily accessible and frequently reviewed management plan). Thus the investigation concludes with providing recommendations for enhancing the impact of NRMPs, particularly in relation to the wetland rehabilitation currently being undertaken in South Africa.

Part 3 of the document takes six of the 21 wetlands included in Part 2, and examines specifically the element of participation of the different parties involved in the rehabilitation, with a particular focus on the long-term sustainability of the rehabilitated wetland. The participation of each of the involved parties is examined for each phase of the project (initiation, planning, implementation, monitoring and evaluation). Based on interviews with participants, the nature of their participation was characterized according to the following types: (1) passive participation, (2) participation in information giving, (3) participation by consultation, (4) participation for material incentives, and (5) participation as a partner.

The key assumption underlying this study is that the greater the level of participation, particularly through active participation of the landholders as partners, the greater is the likelihood of the long-term sustainable management of the wetland. The six different projects examined vary considerably in this regard, ranging from those where the landholders are actively involved as partners in all of the phases of the project to those where the involvement of landholders is primarily passive or achieved through consultation. However, even in those projects where the active involvement is generally strong, landholders have limited involvement in the evaluation of the projects.

Part 4 of the document presents a framework for assessing the effectiveness with which various organizations collaborate. The framework starts with three underpinning principles, namely the presence of an explicit shared purpose, reciprocity (i.e. give and take) and effective, open communication. Criteria are then given for assessing whether each of these principles is being attained. For example, the two criteria for assessing explicit shared purpose are (1) the collaborative purpose is explicitly stated and (2) the collaborative purpose should be attained by consensus. The criteria provide a reference point against which the principles can be evaluated or judged. Each criterion is further disaggregated

into indicators. A scoring system is used to assess the level of achievement of each principle.

Part 4 points out that although it is recognized that a collaborative approach is generally required, collaboration often involves a lot of resources. Therefore, where resources are limited, collaboration should be 'directed' to those situations most requiring it. To assist in this, Part 4 presents the conceptual model of Kinnaman and Bleich (2004), which indicates that where the level of certainty that specified actions will produce certain outcomes, and the decision-makers' level of agreement regarding the appropriate course of action for the situation are typically high, then a 'command and control' type of behaviour is generally appropriate. However, where the level of certainty or agreement is low, then generally collaborative behaviour will be most appropriate.

To illustrate the application of the framework presented in Part 4, a case study of the Rietvlei wetland is described. This wetland has been impacted upon by a variety of land-use activities in its catchment and on-site. There was a clear, shared purpose for the rehabilitation initiative and a good spirit of give-and-take existed in the initiative. However, some organizations indicated that the rehabilitation plan focused too much on problems within the wetland and did not address wider wetland issues (e.g. pollutant inputs from the upstream catchment). Overall, communication was not good, and the most important factor affecting the quality of communication was that it was often not clear to those involved in the initiative what information was needed and by whom. The greatest need for collaboration was probably in the phase that addressed the question of how to sustain the outcomes of the rehabilitation in the long term (and was associated with high levels of uncertainty). However, the behaviour exhibited in this phase of the project was mainly coordination, with one organization playing a much more prominent role than any of the others. This is probably the area that would have most benefited from a greater investment in joint problem-solving and decision-making, particularly involving the landowner.

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The Water Research Commission (WRC), South African National Biodiversity Instutute (SANBI) and Working for Wetlands (WfWetlands) are gratefully acknowledged for funding the development of this tool. The entire WfWetlands team has taken an active interest and participated in the development of this tool. The WRC has been very supportive in offering strategic and administrative assistance. The research programme was managed by Fred Ellery of the University of KwaZulu-Natal (UKZN), who was ably assisted by Kerry Philp. Karen Ellery provided substantial editorial input during the production of this document.

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Feedback

In South Africa the rehabilitation of wetland ecosystems is still in its infancy. In order to promote the growth of this activity, this manual needs to be revised by including the experiences of those individuals involved in wetland rehabilitation within South Africa. Any comments or advice can be sent to:

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TABLE OF CONTENTS

PART 1

The impact of Natural Resource Management Programmes on the status of wetlands in South Africa: an assessment at programme-level

Kotze DC

1 Introduction

There are a number of Natural Resource Management Programmes (NRMPs) under way in South Africa which are focused, totally or partially, on wetland issues. As yet there has been very little evaluation of the individual or collective impacts of these programmes on the status of wetlands. For the purposes of this research, 'wetland status' refers to 'wetland health and management status'.* The assessment in this report is part of a broader research programme on wetland rehabilitation funded by the Water Research Commission. The terms of reference for this assessment specified that the impacts of natural resource management programmes should be assessed in terms of their tangible effects on the status of wetlands. Thus an assessment was undertaken of individual wetland sites that were the focus of NRMPs (given in Part 2 and 3 of this document). At the same time, a broader perspective was also needed of some of the major programmes that promote the conservation and rehabilitation of wetlands. The intention was not to evaluate individual programmes in detail but rather to gain a broad understanding of the collective impact of these programmes on the status of wetlands. The primary objectives of Part 1 of this document were to:

- broadly assess the impact of NRMPs on the status of South African wetlands and to identify how this impact differs across various land-use and tenure sectors.
- identify the potential key factors that determine the impact of these programmes in the various sectors.
- provide recommendations for enhancing the impact of NRMPs, particularly in relation to the wetland rehabilitation currently being undertaken in South Africa.

The investigation of the programmes in Part 1 is seen as complimentary to the investigation of individual wetland sites in Part 2 and 3 of the document. Five national programmes that are considered to have the most direct relevance to wetlands was examined. The scope of the assessment restricted the detail to which each programme could be investigated and the number of programmes selected, recognizing that there are many other programmes potentially impacting upon wetlands. Furthermore, the assessment did not evaluate the effectiveness of the regulatory activities of government departments (e.g. in terms of administering the National Water Act, Conservation of Agricultural Resources Act and the National Environmental Management Act).

* Wetland health is defined as a measure of the deviation of a wetland's structure and function from its natural reference condition. Depending on the extent and intensity of human impacts on a wetland, its health status will vary from pristine (natural) to poor. Health status can be described at different scales from that of an individual wetland or portion thereof through to that of wetlands collectively in a catchment, bioregion, province or country. Management of a wetland refers to the exercising of control over the use of the wetland. It may encompass several different mechanisms and processes (e.g. a vision and objectives, a management plan and a monitoring and evaluation system) which may be formal or informal.

2 Methods

The investigation of NRMPs was based on open-ended interviews and e-mail correspondence and was conducted with key informants working within each of the programmes. In addition, interviews were conducted with key informants from the stakeholder groups (e.g. the commercial timber industry) that are potentially affected by the NRMPs. In both the interviews and e-mail correspondence, the respondents were asked what difference they believed their programme had made to the status of individual wetlands in South Africa. Their responses were then probed for more detail using a series of follow-up questions. Existing documentation relating to the programmes was also used for the assessment. Two key documents that are referred to are evaluation reports that had recently been undertaken for Mondi Wetlands Project (MWP) (Rosenberg and Taylor, 2005) and Working for Water (WfWater) (Common Ground, 2003). WfWetlands had recently developed a comprehensive strategic plan (Working for Wetlands, 2005), and while this was not an evaluation *per se*, the process of its development included a reflection on past activities, which provided useful reference material. The limited resources available for the assessment did not allow for primary data to be collected. However, the assessment of management effectiveness of the 21 individual wetland sites reported in Part 2 was used to inform the programme-level assessment.

The results of the assessment are described in three sections. In the first section, the scope of each of the NRMPs is described according to the following parameters:

- types of stressors to wetlands addressed by the NRMP
- types of wetlands/wetland issues addressed
- sectors addressed by the NRMP
- geographical area of operation of the NRMP.

In the second section, the nature of the impacts of the individual NRMPs was assessed. In the third section, an overall assessment was conducted of the collective impact of the programmes based on the results of the overview and the assessments of individual programmes.

The assessment of impact of individual NRMPs was not based on prescribed, detailed criteria. Instead, very broad criteria were used, namely (1) the direct contribution of the NRMP to the rehabilitation of wetlands and (2) the contribution of the NRMP to supporting the protection and wise use of wetlands. The methodological approach used in the evaluation was based on that of Rosenberg and Taylor (2005). This is a dialogue-orientated approach to evaluation, where issues are addressed in a process of dialogue with participants, and questions are progressively clarified with participants. A 'report and respond' document is used to provide an interactive process of engagement with participants. For this assessment, an initial draft report of the assessment was circulated to representatives of the NRMPs included in the assessment as well as to representatives from other programmes potentially impacted upon by the NRMPs. These representatives were invited to respond to the report. A key element of the approach is the educational value it provides for all those involved, with the emphasis on learning by all the parties involved, rather than the evaluation being confined to an end in itself.

An additional element that was explored for the evaluation was the identification of specific objectives that had been set by each programme in relation to wetland management, and to then evaluate the extent to which the programme had achieved these objectives. This approach was found to be unviable as explicit objectives relating to wetland management had not been set by several of the programmes or, in some cases, programmes had only very recently set such objectives. This in itself was an important finding, and will be discussed later in the report.

Before reporting on the results of the assessment, an overview is provided on the principal land-uses that affect the health status of wetlands in South Africa. This overview provides the context of the assessment and is based on a revised and expanded contribution made by the authors to the report of Rosenberg and Taylor (2005).

3 A brief review of land-use types that impact on the status of wetlands and the institutional environment that affects wetlands

3.1 Impact of land-use types on wetlands

Wetlands are impacted on by a number of different land-uses occurring within the wetland or within its upstream catchment. These land-uses vary considerably in their extent and intensity with some (e.g. mining) having a very intense impact on the affected wetland, but with the extent of the wetland area affected being low. Others, such as livestock grazing, generally have a lower intensity of impact but with a greater extent of wetland being affected. An overview of the situation in South Africa is provided (Tables 1.1 and 1.2 and Figure 1.1), and it recognizes that there are important differences between the various provinces in the country. For example, in KwaZulu-Natal there are a greater number of land-uses impacting on wetlands than in the Free State, and in addition they tend to have a higher magnitude of impact, owing mainly to their generally greater extent of impact than in the Free State (Figure 1.2). It is also recognized that impacts have over time shifted due to the influence of socio-economic and political changes (Table 1.1). The magnitude of impact of some land-uses (e.g. sugar-cane) has recently remained fairly stable, while the impact of other land-uses (e.g. urban developments) recently has increased markedly.

Table 1.1: The impact of land-uses on the health status of wetlands in South Africa

Uses	Historical impacts on wetlands	Current and future impacts on wetlands
Commercial mixed cultivation	Almost all of the transformation of wetlands on commercial agricultural lands took place prior to the late 1980s with the support of the Department of Agriculture. Wetlands were particularly attractive areas for cultivation prior to the ready availability of electricity for the irrigation of non-wetland areas (Kotze *et al*., 1995; Kotze, 2002).	Much of the original wetland area that was transformed continues to be used (although some areas have been abandoned). But very little new development in wetlands has taken place since the late 1980s. However, the indirect impacts of irrigated agriculture on wetlands (through its competing demand for water) continue to increase. The greatest proportion of wetland still actively used for mixed agriculture is likely to be planted pastures for dairy production (Kotze, 2002).
Sugar cane production	As above.	Almost all of the original wetland areas developed are still used but little new development in wetlands has taken place since the late 1980s, as above.
Subsistence cultivation	Historically this had little impact because only a limited extent of wetlands was occupied by this land-use.	Much new development of wetland has taken place since the mid 1990s. The extent of wetland converted to subsistence-agriculture lands is likely to continue to increase in the future (Kotze *et al.*, 1995; Kotze, 2002).
Commercial forestry	Extensive planting directly in wetlands (resulting in a high intensity of impact) and across the catchments of wetlands (resulting in reduced water inflows to wetlands) took place prior to the 1980s.	Considerable withdrawal of trees planted in wetlands has taken place since the mid 1990s, with the extensive recovery of wetland habitats. Indirect impacts from forestry water use in wetland catchments have remained fairly stable over the last decade.
Urban and industrial development	Some large wetlands were destroyed during the previous two centuries through urban developments (e.g. harbours and airports) (Kotze *et al.*, 1995).	Although current developments tend to be around remaining wetlands, the incremental loss of small wetland areas is continuing and indirect impacts (e.g. from poor storm water management and pollution) are rapidly increasing, particularly with the accelerated infrastructural development that has been taking place over the last few years, and which is set to continue.
Mining	Mines, especially open cast mines, have impacted upon wetlands through direct destruction of wetlands. Mines have also severely contaminated the water supplies of some wetlands.	Although still impacting upon wetlands, the extent to which mining activities contaminate water supplies is now better controlled (through legal mechanisms) than it was in the past. However, open cast mines, mainly for coal, are continuing to destroy extensive wetland areas in certain locations (e.g. the upper Olifants River catchment, Mpumalanga province).
Water storage dams	In South Africa, both large water-supply dams and farm dams have transformed extensive areas of wetland through deep flooding behind the dam wall, and have interfered with the supply of water and sediment to downstream wetlands.	The number of dams and the resulting loss of wetlands from deep flooding have continued to increase steadily over the last few decades, and are likely to continue to do so in the future.
Livestock grazing* / Erosion	Many of South Africa's wetlands are naturally susceptible to erosion but the occurrence and severity of erosion was increased by human activity, especially through the grazing of livestock. Stocking rates were especially high in the first half of the 1900s, precipitating the extensive erosion of wetlands.	Stocking rates have generally declined towards the end of the 1900s and into the 2000s, and consequently some eroded wetlands are well-stabilised. However, the active erosion of many wetlands continues, albeit at a generally slower rate than at times in the past.
Invasive alien plants	Wetlands were invaded by alien plants widely across South Africa, but especially in the eastern and southern parts. Invasive alien plants are generally favoured by other impacts, e.g. drying out of the wetland's catchment and on-site disturbance of the soil.	Although extensive clearing operations have considerably reduced the extent of alien plants in many wetlands, the extent of alien plants continues to increase widely in many others.

*Although grazing does not result in the same level of transformation as the other land-uses listed in the table, poor grazing practices are probably the most important human-related factor contributing to the accelerated erosion of wetlands, which is a very important source of degradation. However, it should be highlighted that other forms of land-use (notably cultivation, which disturbs a wetland and makes it more susceptible to erosion, and urban development, which often increases the intensity and therefore the erosive potential of stormflows to a wetland as a result of hardened surfaces in a wetland's catchment) may also be very important factors contributing to erosion.

Table 1.2: Current extent and intensity of impacts on the health status of wetlands in South Africa

Land-use types	Main affected provinces	Extent of wetlands affected across SA	Intensity of impact on health status of the affected wetlands
Commercial mixed cultivation	All provinces	****	********
Sugar-cane production	KZN, Mpumalanga	*****	*******
Subsistence cultivation	KZN, Limpopo, Mpumalanga, E Cape	***	******
Commercial forestry	KZN, Mpumalanga, E Cape, W Cape	******	*****
Urban & industrial development.	All provinces	**	*******
Mining	Gauteng, Mpumlanga, Limpopo, North West	**	********
Water storage dams	All provinces	****	*******
Livestock grazing	All provinces	**********	***
Invasive alien plants	All provinces	**********	******

* = Low, ***** = Intermediate, ********** = High

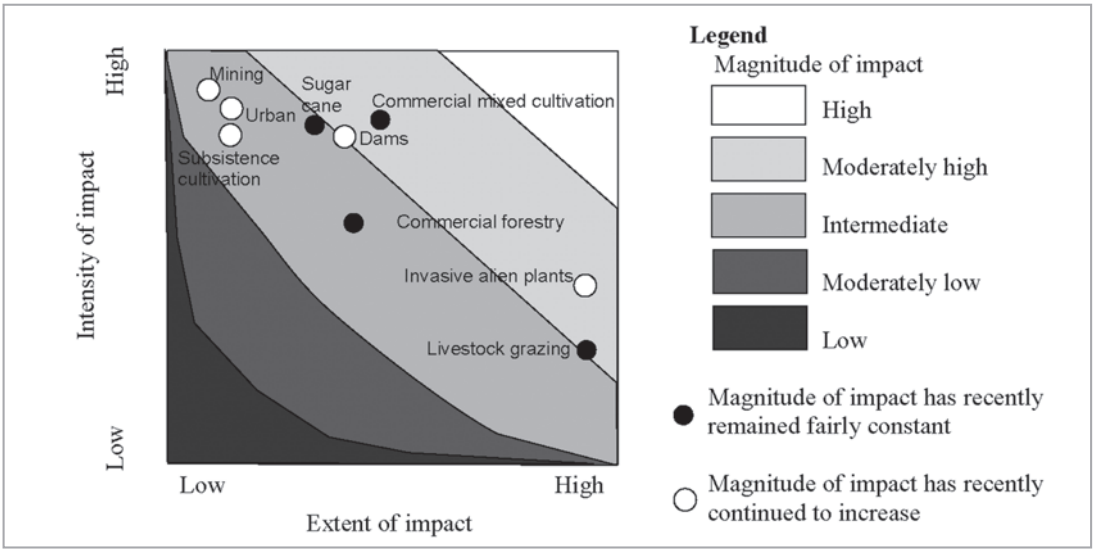
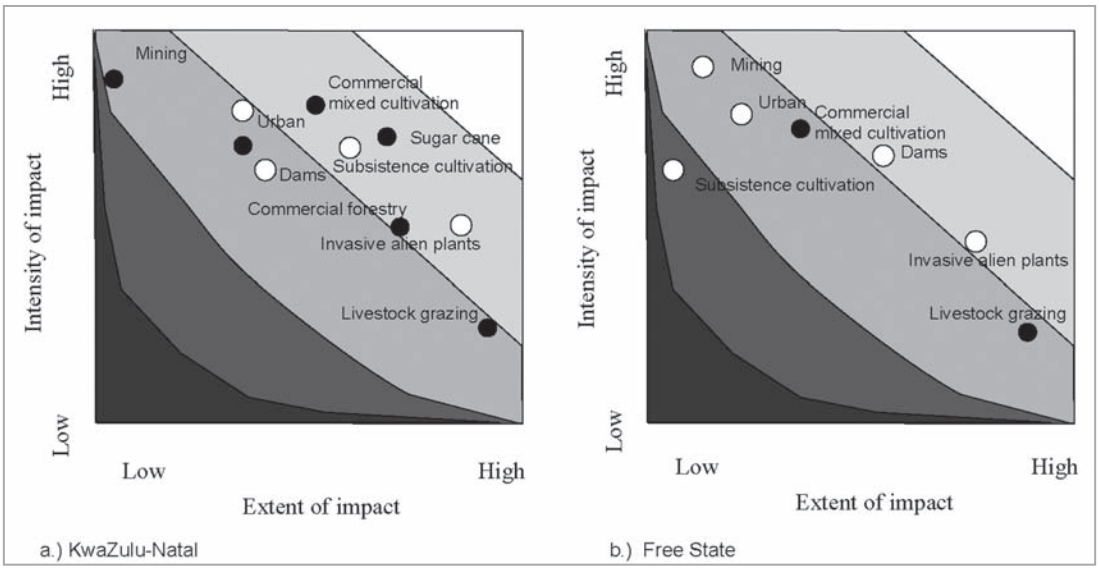


Figure 1.1: Magnitude of impact of different land-uses affecting the current health status of wetlands in South Africa



Legend: see Figure 1.1

Figure 1.2: Magnitude of impact of different land-uses affecting the current health status of wetlands in two selected provinces, KwaZulu-Natal and Free State.

In South Africa, most wetlands fall within the privately-owned, large-scale, commercial agricultural sector. However, many wetlands also fall within the communally-owned, small-scale agricultural sector. Extensive wetland areas were transformed into commercial cropland in South Africa, prior to the 1980s, with government support in the form of advice and subsidies. During the 1980s, with increased awareness of environmental issues, government support for wetland development declined and legislation for wetland protection was developed. The Conservation of Agricultural Resources Act 43 of 1983 makes provision for wetland protection by requiring a permit for the cultivation or draining of a wetland. It appears that although there are few new wetland areas being transformed for large-scale commercial crop production in South Africa, the extent of subsistence and small-scale cultivation within wetlands has noticeably been increasing, especially in KwaZulu-Natal and Mpumalanga Provinces (Kotze *et al.*, 1995; Kotze 2002). On the whole, there has been little intervention by government agencies in the expansion of cropland into wetland areas by subsistence farmers (Kotze, 2002). From a food security point of view, wetland cultivation is important, especially during periods of drought. At the same time, however, the cumulative impact of the transformation of a wetland by many small-scale farmers may be great, and may ultimately be detrimental to the most needy persons.

3.2 Institutional factors affecting wetlands

The following features contribute to the high complexity of wetland management.

- Wetlands are typically located in the transition between terrestrial and aquatic systems, resulting in wetlands being of relevance to both land and water management.
- The functioning of wetlands is influenced by processes locally at the wetland (e.g. grazing of wetland vegetation) and by processes operating at broader scales especially in the catchment upstream of the wetland (e.g. abstraction or pollution of water upstream of the wetland) as well as in broader landscapes.
- Similarly, wetlands supply ecosystem services locally (e.g. a household living

alongside the wetland harvests reeds) as well as to distant beneficiaries (e.g. water users downstream benefit from the water quality enhancement provided by the wetland).
- Wetlands deliver a broad spectrum of ecosystem services, of relevance to a variety of different sectors.
- Wetlands are often subject to conflicting land-use demands (e.g. they are recognized as having high biodiversity value, while at the same time providing potentially fertile lands for cultivation, particularly for farmers lacking resources for irrigation and fertilizers).

For these reasons, a number of policies, organisations and stakeholders often are concerned with a particular wetland. For example, a water management agency and a biodiversity conservation agency may both be concerned, for different reasons, with maintaining the integrity of a particular wetland. Thus the potential for duplication of effort, or alternatively for synergy, is great. In some cases, potential conflict may result from different agencies having divergent mandates in relation to wetlands.

South Africa does not have a specific national policy on wetlands. However, key policy elements around wetland conservation are found in the National Water Act (NWA), which introduced the important concepts of the Ecological Reserve and an integrated approach to water resource management. As Catchment Management Agencies, key agents in the implementation of the NWA, come into operation, the influence of the NWA over wetland management will increase, particularly in a catchment context. Key elements of wetland policy are also contained within the Policy on the Conservation and Sustainable Use of South Africa's Biological Diversity. It would appear therefore that South Africa is not greatly lacking in policy relating to wetlands. More importantly, however, there is no national strategy with multi-stakeholder buy-in for the conservation and wise use of wetlands (i.e. a co-ordinated means of putting policy into action). In this respect, South Africa is lagging behind countries such as Uganda and Ghana.

The three national government departments most directly mandated with regulating the use and management of wetlands are the Department of Environmental Affairs and Tourism (DEAT), the National Department of Agriculture (NDA) and the Department of Water Affairs and Forestry (DWAF). Each of these three departments is responsible for Acts which include legal measures to protect wetlands (Environmental Conservation Act, National Environmental Management Act, Conservation of Agricultural Resources Act and the National Water Act). In addition, the New Biodiversity Act creates, through incentives, opportunities for landowners to commit to ecosystem conservation (Botha, 2004). As a signatory to the Ramsar Convention* South Africa has international obligations for the protection and wise-use of wetlands.

Besides performing their statutory functions, the three departments also each administer incentive-based wetland programmes, including:
- Working for Water (WfWater) Programme, a large-scale public works programme with a poverty-relief focus for the control of invasive alien plants, that involves DWAF (the lead agency), DEAT and NDA.
- Working for Wetlands (WfWetlands), a multi-departmental public works programme that implements wetland rehabilitation projects using an approach focussed on poverty relief.
- LandCare Programme (administered by the Department of Agriculture) that promotes sustainable agricultural land-use practices, food security and poverty relief.

* The Ramsar Convention is the convention on wetlands, signed in Ramsar, Iran, in 1971. It is an inter-governmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. South Africa is among 146 contracting parties to this Convention.

WfWater, WfWetlands and LandCare all have the dual objectives of addressing environmental degradation and poverty. These objectives are addressed with local communities through many individual projects across the country. The emphasis of the DEAT Wetland Programme is somewhat broader and operates at an administrative level through providing co-ordination services and direction to provinces. WfWetlands is, however, increasingly taking on functions of the DEAT Wetland Programme (e.g. administration of the national wetland inventory).

The NDA has largely become a body for the determination of agricultural policy on matters of national interest (as well as having a regulatory function through the administration of the Conservation of Agricultural Resources Act), whereas the provincial departments are responsible for the management of agricultural matters of local importance. Similarly, there is concurrency of the environmental management function, in terms of the Constitution, between DEAT (which operates at national level) and provincial levels of government. National DEAT operates primarily in the development of policy, trans-boundary projects and projects of national environmental interest. Implementation of the Environmental Conservation Act and the National Environmental Management Act is primarily undertaken at provincial level.

In addition, through the Integrated Development Planning process all local authorities are required to set land development objectives, which can strongly influence future patterns of land-use. All land now falls within a municipal district, and municipalities are becoming increasingly influential (positive or negative) in developments that potentially impact upon both urban and rural wetlands.

The Mondi Wetlands Project (MWP) is a non-government organisation (NGO) with the greatest involvement in wetland management and development issues at a national level. The primary focus of the MWP is the wise use of wetlands in rural areas and supporting government departments in fulfilling their mandates in relation to wetlands. The Endangered Wildlife Trust (EWT), another NGO, has primarily been involved in the promotion of the conservation of crane species and the wetland habitats on which the cranes depend.

Some key institutional problems facing the promotion of effective wetland management are:

- Some very good legislation is in place, but in many cases there is a lack of capacity and resources for its implementation.
- Civil society is often inadequately mobilized, given that the government cannot be expected to carry out all regulation but relies on civil society to contribute through self-regulation.
- Insufficient mechanisms for ensuring accountability amongst the managers and within government departments.
- Declining extension services in many of the government departments, especially in specific provinces.
- Poor communication and co-operative governance among the various government departments and stakeholders, leading to poor horizontal and vertical integration.
- Lack of clarity regarding roles and responsibilities of different role-players.

In summary, this section describes how the level and spatial distribution of impact varies according to the particular land-use sector. It highlights that the collective impacts of the different land-use sectors on South African wetlands have been great. It further describes the several policies and statutes that have been developed in response to the need for the protection of wetlands, and indicates how institutional problems continue to hinder the implementation of these policies and statutes. This section provides context for the following section, which explores NRMPs in relation to land-use sector and geographical area of operation.

4 An overview of the scope of the programmes assessed

Three government-led programmes, Working for Wetlands (WfWetlands), Working for Water (WfWater) and LandCare, South Africa, and two NGO-led programmes, Mondi Wetlands Project (MWP) and the Crane Conservation Programme of the Endangered Wildlife Trust (EWT) and its crane conservation partners, were examined.

The programmes differ greatly in terms of their scope (Table 1.3). While WfWater is narrow in terms of the stressors it addresses, it operates broadly across wetland types, sectors and geographical areas. WfWetlands is similar but addresses different stressors. LandCare is focused on one particular sector and its associated impacts but thereafter it operates broadly. MWP deals with a broad range of impacts but concentrates on a few sectors and works nationally, although its fieldwork is focused particularly on two provinces. EWT is narrowest in terms of the specific types of wetlands it deals with and, by virtue of the geographical location of these wetlands, the particular sector with which it works and the impacts it addresses.

Table 1.3: A summary of the scope of the different programmes examined

Criteria for **defining the** scope of the programme	Programme				
	WfWater	WfWetlands	LandCare	MWP	EWT
Types of impacts addressed	Alien plants	Mainly erosion & on-site desiccation from drains & gullies	Mainly relating to subsistence agriculture and erosion	Broad, including subsistence and commercial agriculture	Mainly dams & burning
Types of wetlands	Broad – in areas invaded by alien plants	Broad but especially in wetlands susceptible to erosion	Broad, but relating especially to erosion & alien plants	Broad	Wetlands supporting breeding cranes, especially wattled cranes
Sectors addressed	Broad, including government, private and communal land		Mainly communal rural areas	Broad but mainly in forestry, sugar & communal rural	Mainly in commercial mixed agriculture
Geographical extent of operation	National	National, but predominantly in the east	National	National, but fieldwork mainly in Limpopo and KZN	National, but mainly in KZN midlands, Mpumalanga highveld & NE Cape

Table 1.3 and Figure 1.3 represent the current situation. It is important to recognize that the scope of the programmes, in particular the MWP and WfWetlands, has evolved considerably over time. In the mid to early 1990s, MWP were very actively involved on the ground in surveying wetland sites and identifying impacts, which provided a useful basis for directing rehabilitation to appropriate locations. MPW then lobbied WfWater to undertake the rehabilitation of wetlands transformed by erosion and artificial drains. This led to WfWetlands being established, firstly as a sub-programme within WfWater and then as a stand-alone programme under DEAT. In its initial stages, the MWP was actively involved in providing support to WfWetlands. Rehabilitation was undertaken through close liaison between DEAT, WfWater and MWP.

As WfWetlands became established as a stand-alone programme, the involvement of WfWater and MWP declined considerably, although they continued to serve on the steering committee of WfWetlands. A key issue identified in the MWP evaluation (Rosenberg and Taylor, 2005) was that WfWetlands sought a closer and more sustained collaboration with MWP. This resulted in 2006 in the MWP actively contributing to the WfWetlands planning process, and collaborating with WfWetlands on a wise-use programme and a training and capacity building programme. Currently, MWP is working jointly with other organisations on initiatives more so than any other organisation (Figure 3), which is not surprising given the flexibility it has as an NGO, its sole focus on wetlands and its catalytic and direct support approach.

LandCare has only a few project sites dealing specifically with wetlands. In some of these they have worked closely with Mondi Wetlands Project at site level, including Mbongolwane in KwaZulu-Natal and a few LandCare sites in Limpopo Province.

EWT helped in the identification of good candidate sites for rehabilitation. Lately, however, the level of direct collaboration with the other organizations has been less so than it was in the past.

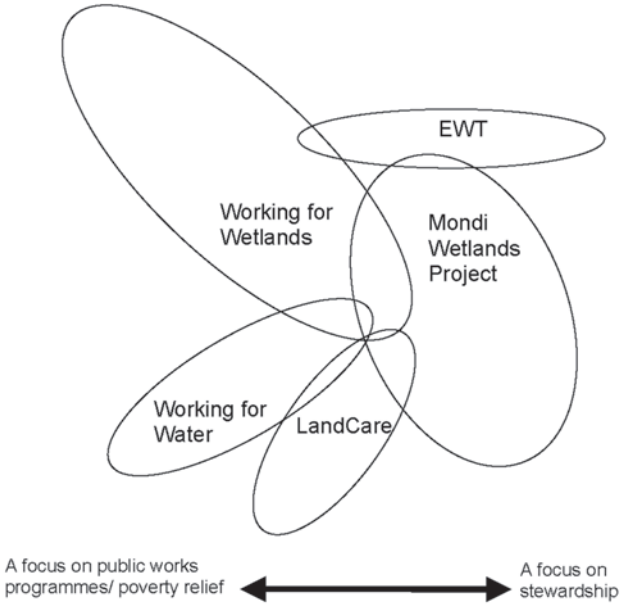


Figure 1.3: Current inter-relationships in joint work on wetlands amongst the natural resource management programmes examined

Note: each ovoid represents the work being conducted on wetlands by a particular programme, and the extent to which the ovoids of different organizations overlap represents the level to which they work together jointly on initiatives in wetlands. The size of the ovoid represents, in an approximate sense, the specific emphasis that the particular programme places upon wetlands.

Based on the information presented in this section, it can be concluded that although the programmes reviewed address a diversity of impacts, erosion and alien plants are the principal impacts addressed. Government-led programmes tend to be mainly works-dominated while the NGO-led programmes tend to be more stewardship-orientated, which is seen to be complementary. Nevertheless, from the perspective of the long-term sustainability of the interventions, a greater emphasis needs to be placed throughout all programmes on encouraging greater stewardship amongst all land-users.

5 The individual programmes

5.1 Working for Wetlands

Working for Wetlands is a national government-funded programme, with a poverty-relief focus used to achieve its core business, which is the implementation of large-scale wetland rehabilitation projects. This has allowed for a significant amount of funding to be made available for wetland rehabilitation (Dini, 2004).

> "Working for Wetlands came into being when the policy imperative to rehabilitate wetlands was matched with the government's priority to create employment and alleviate poverty through the use of public works programmes. In its four years of existence, firstly as a sub-programme within Working for Water and then as a stand-alone programme under DEAT, the Working for Wetlands' track record in the delivery of outputs relating to poverty alleviation and employment creation was established. Public assets are being rehabilitated while at the same time contributing to the objectives of the Expanded Public Works Programme. (Working for Wetlands, 2005)."

Over four years, the Working for Wetlands (WfWetlands) programme undertook rehabilitation work in over 100 wetlands across South Africa. Although a formal system of monitoring the outcomes of wetland rehabilitation was not in place, the vast majority of the rehabilitation interventions appear to have resulted in some form of improvement in the state of health of the wetlands (J Dini, 2006, *Pers. comm*., Working for Wetlands, Pretoria). The extent to which the health of the rehabilitated wetlands are improved or secured varies from wetland to wetland, as do the goods and services that are delivered by the wetland. As elaborated upon by Kotze *et al*. (2009) the extent to which the health of a wetland is restored or secured can be expressed in terms of hectare equivalents of functional wetland reinstated or secured.* Based on the assessment of selected WfWetlands rehabilitation projects (e.g. Kotze and Ellery, 2009) it is estimated that approximately 1 to 50 ha equivalents of integrity have been reinstated or secured per rehabilitated wetland. Taking a conservative estimate of 12 ha equivalents per wetland for 100 rehabilitated wetlands, this translates into 1 200 ha that have been reinstated.

There is a growing recognition that the activities of WfWetlands should extend beyond physical rehabilitation measures, as captured by Working for Wetlands (2005):

> "The (WfWetlands) programme is now seen as an appropriate vehicle to do more than mechanical rehabilitation work. Coupled with this is the recognition that rehabilitation can only be truly effective if aligned with a range of supplementary activities, including education, extension and enforcement. This requires the coordinated attention of several government departments.

* The situation without rehabilitation (i.e. no intervention) is compared to the situation with rehabilitation. Health is scored on a scale of 0 scored on a scale of 0 (pristine) to 10 (critically altered). The benefit achieved, would be the improvement in relation to the maximum score. For example, if the score without rehabilitation is 7 (e.g. as a result to the desiccating effect of a network of drains) and this improves to a score of 2 (e.g. through the construction of rehabilitation plugs in the drains) then the improvement in the 60 ha rehabilitated wetland area would be calculated as follows: The hectare equivalent without rehabilitation would be (10-7)/10 x 60 ha = 18 hectare equivalents of healthy wetland. The hectare equivalent with rehabilitation would be (10-2)/10 x 60 ha = 48 hectare equivalents of healthy wetland. Therefore the rehabilitation will effectively re-instate 48-18 = 30 hectare equivalents of healthy wetland. If, however, the score had only been increased from 7 to 5 (perhaps because of insufficient plugs) then this would be equivalent to re-instating 12 hectare equivalents of healthy wetland.

In reflecting upon its current activities, in collaboration with key stakeholders, Working for Wetlands recognises that, whilst its activities have historically been restricted to the erection of structures to assist the rehabilitation of wetlands, its activities should be expanded to encompass:

- a more comprehensive approach to rehabilitation, which is not restricted to the erection of structures
- proactive projects to protect targeted wetlands and promote the sustainable use of others.

By doing this it will act as a catalyst for similar projects in South Africa that do not fall under the Working for Wetlands ambit.

WfWetlands have already begun playing the role of a catalyst in promoting the enhanced management of wetlands, particularly through the extensive support that they have provided to the provincial wetland forums. However, this catalytic role has generally not been according to an explicit plan and the outcomes of these efforts are much more difficult to measure than those of the physical rehabilitation interventions. *How do we measure the ripples created by our work?*. Many of these benefits are not readily captured in the management-by-objectives framework used for the assessment of individual wetlands but are part of a bigger initiative that extends beyond an individual site." (J Dini, 2006, *Pers. comm.*, Working for Wetlands, Pretoria)

According to WfWetlands, one of the greatest contributions that they have made to the improved management of wetlands is through enhancing the wetland management capacity of nature conservation bodies. This has applied particularly to SANParks.

"Our five current projects, occurring in four different parks (Kruger, Mountain Zebra, Agulhas and Golden Gate), have resulted in a greater emphasis being placed on general wetland management issues by SANParks. For example, SANParks is now undertaking systematic wetland mapping and assessment in some of its parks in order to better inform rehabilitation planning and the integration of wetlands into management plans. Training on wetlands has also been commissioned by SANParks, and targets appropriate operational levels (e.g. section rangers) in order to capacitate them to feed into the mapping and assessment processes. Overall, our interventions have resulted in wetlands attaining a higher profile within the parks, not only concerning rehabilitation, but also concerning general management. SANParks has even recently published a brochure on wetlands in parks." (J Dini, 2006, *Pers. comm.*, Working for Wetlands, Pretoria)

WfWetlands have also contributed to enhancing the management capacity of Eastern Cape Nature Conservation at the Ntsikeni Nature Reserve. Little influence appears to have been exerted over wetland management by the remaining provincial nature conservation bodies.

WfWetlands is potentially in a strong position to contribute to the 'bigger picture' of wetland conservation of individual sites in South Africa through the contribution of the WfWetlands regional coordinators (six in total) and project managers (over 30 in total) from the agencies implementing WfWetlands projects. At present, however, the principal focus of these individuals is understandably on the specific details of implementing rehabilitation measures. However, some do manage to varying degrees to make a broader contribution, but this could be strengthened.

Another key area in which Working for Wetlands has contributed to the 'bigger

picture' is through the support that they have provided to the Provincial Wetland Forums. These forums are vehicles through which cooperative governance is promoted. When the forums were initiated, many were dealing primarily with wetland rehabilitation issues but, with time, the scope of the forums has become progressively much broader. Most forums regularly deal with the issue of regulating those activities that are harmful to wetlands, and in this way the forums potentially contribute to stemming future wetland degradation and loss.*

As WfWetlands expand their areas of activity, they are aware of the possibility of impinging upon the responsibility of government departments. "Have we created a parallel structure to fill gaps left by cooperative governance failures?" (J Dini, 2006, *Pers. comm.*, Working for Wetlands, Pretoria). Rather than setting themselves up as a new bureaucracy, WfWetlands should assist the relevant government departments in meeting their responsibilities. "We need to persuade them (the government departments) that we (WfWetlands) are an extension of themselves." (J Dini, 2006, *Pers. comm.*, Working for Wetlands, Pretoria). But WfWetlands could, in fact, be contributing to weakening the capacity of existing government departments in two ways: (1) by 'stealing' competent staff from these departments and (2) by allowing these departments to renege on their responsibilities in relation to wetlands because these responsibilities are now seen to be 'covered' by WfWetlands.

It can be concluded that the principal impact of WfWetlands has been to enhance directly the state of health of approximately 100 wetlands through the implementation of rehabilitation measures that have secured or reinstated at least 1 200 ha of wetland, located across a diversity of different land-use sectors. Much more difficult to quantify is the impact that WfWetlands has had on positively influencing the protection and wise use of South Africa's wetlands. The contribution to improving the protection and wise use of the approximately 100 sites that have been rehabilitated is great for some sites but is generally intermediate to low for most sites, given that most WfWetlands resources need to be focused primarily on the rehabilitation measures. Most difficult to evaluate is the impact beyond the rehabilitated wetland sites to other wetlands. In this regard, one of the key contributions has probably been through their support for the Provincial Wetland Forums, as discussed earlier.

5.2 Working for Water

Working for Water (WfWater) is a large-scale public works programme with the joint objectives of controlling invasive alien plants and relieving poverty. The overall purposes of the programme are to recover water being lost to invading alien plants, to create jobs, empower individuals and build communities, and to conserve biological diversity, ecological integrity and catchment stability. WfWater is multi-departmental and includes the Department of Water Affairs and Forestry (DWAF), the lead agency, the Department of Environmental Affairs and Tourism (DEAT) and the National Department of Agriculture (NDA).

One of the key threats and impacts to wetlands is the invasion of alien plants. Working for Water has been involved in extensive alien plant clearing operations across South Africa for approximately the last 10 years. Working for Water has focused especially on riparian areas, where many of South Africa's wetlands are located. Thus the contribution that WfWater has made to improving the status of wetlands through clearing of invasive alien plants is potentially large.

* A formal assessment of the effectiveness of three selected provincial forums is being undertaken.

This contribution includes the clearing of alien plants that are growing both within wetlands as well as in the upstream catchments that feed the wetlands

"The WfWater Programme has made no provision for routine project monitoring or evaluation with respect to the ecological response of alien clearing. Even research in this regard is scant." (Common Ground, 2003). Thus it is very difficult to evaluate how successful WfWater has been with regard to the clearing of alien plants generally or those impinging upon the status of wetlands. However, some case study examples can be cited. These include the Krom River wetland and the wetlands of the Featherstone Kloof, both of the Eastern Cape, where the extent to which alien plants occur in wetlands has been greatly reduced. Other examples include the control of alien plants in wetlands associated with the Greater St Lucia Wetland system and in the catchment of the Mvoti vlei, KwaZulu-Natal.

The Krom River wetland (one of the sites examined in Part 2) was extensively invaded by black wattle and through the alien plant-clearing programme of WfWater, the extent of their occurrence has been considerably reduced. This has not only allowed the native palmiet vegetation to recover, but has also contributed to reducing the risk of erosion owing to the poor rooting capacity of black wattle. Similarly, the dense infestations of pine and other invasive trees in the wetlands of the Featherstone Kloof in the upper Cowie River catchment have been considerably reduced by the clearing operations of WfWater. Re-vegetation of exposed, bare areas left after the clearing of dense stands was also undertaken (E. Haigh, 2006, *Pers. comm.*, Institute for Water Research, Rhodes University, Grahamstown).

WfWater does not have a specific programme that deals with the occurrence, *per se*, of alien plants in wetlands. However, an initiative is under way to identify and coordinate appropriate control measures for aliens in wetlands such as the aquatic weed *Hydrilla verticilliata* and the invasive grass *Glyceria maxima*, which are currently limited in their distribution, but which pose a considerable threat if not controlled.

In conclusion, owing to the scarcity of any monitoring and evaluation of the outcomes of clearing operations it is impossible to make even a very approximate estimate of the magnitude of this impact in terms of the enhanced health of South Africa's wetlands, although it may be potentially great. The contribution of WfWater to the protection and wise use of wetlands is also difficult to assess. However, as elaborated on in the overview, WfWater played a critical role in 'housing' WfWetlands in its formative years. Therefore some of the impact of WfWater on the health status of wetlands has been through the work of WfWetlands. WfWater now plays a much less direct role in the WfWetlands programme.

5.3 LandCare, South Africa

"The goal of the LandCare programme in South Africa is to optimize the productivity and sustainability of natural resources to result in greater productivity, food security, job creation and a better quality of life for all." (LandCare, South Africa, undated). LandCare is about encouraging and supporting sustainable land-use practices and promoting and raising awareness to develop a positive resource-conservation ethic. It is a community-based approach that aims to improve the sustainability of agricultural production systems, address environmental issues and protect the future of South Africa's environmental resources. LandCare is based on the concept and practice of community members providing their time and energy

to identify, plan and implement on-ground works.

LandCare does not have a specific programme that deals with wetlands but it does have some individual projects with a focus on specific wetlands. One of the longest running of these projects is the Mbongolwane wetland project which is detailed in Part 2. This project highlights some key issues which appear to be common to many other LandCare projects.

- The considerably weakened natural-resource management governance structures in the areas in which the project operates.
- The impact of LandCare projects on the status of individual wetland sites depends strongly on the project being able to enhance material benefits to local people.
- The tension between promoting locally-resourced actions (a custodianship approach) and supporting actions through externally-resourced works programmes

As highlighted by Pollard *et al*. (2004), in many of South Africa's communally used areas, local governance structures through which natural-resource use can be controlled have been considerably weakened. Because of this weak base, the task of building local capacity for regulating land-use activities is great.

Owing to weakened natural-resource management structures and high levels of poverty, reducing the pressure on locally used wetlands generally requires an incentive-based approach for enhancing the material benefits to local people. Without these benefits, which should be linked as closely as possible to a soundly functioning wetland, improved environmental sustainability of land-use practices is unlikely.

Custodianship of the environment embraces a community's capacity to identify local environmental problems and to undertake activities themselves to address these problems. A works programme often acts to undermine local resourcefulness and initiative as local people become conditioned to being paid to work to address problems. Thus, when the works programme and its pay-outs end, the activities will often also end.

In most provinces, LandCare works principally within the communal and small-scale agricultural sector. The Koringkoppies Project, in the Limpopo Province, is an example of one of these projects. The project saw the successful construction of extensive gabion structures for controlling erosion, the fencing-off of the spring and the construction of a concrete irrigation canal, a stock watering point and a clothes-washing facility to protect the spring and enhance the benefits that it provided to local people (Anon, 2002). A number of KwaZulu-Natal LandCare projects encompass a diversity of issues (Box 1.1). The Western Cape differs from the other provinces in that there is little communal land in the province and most of the LandCare projects occur on private commercial farmland (the approach used in these projects is described later in this section). The Western Cape LandCare Projects are generally focused on the clearing of alien plants.

An issue facing all the LandCare projects, and that is also faced by most environmentally-focused projects that engage with poor communities, is the tension between investing project resources in short-term measures (usually public-works based) versus long-term measures that build human capacity (e.g. by improving local understanding and strengthening the local management institutions). The short-term measures potentially create very rapid results, both in terms of improvement to the natural environment and in material benefits

Box 1.1: An overview of the KwaZulu-Natal LandCare projects that deal with wetland sites

There are four LandCare projects in KwaZulu-Natal that deal specifically with wetlands and they are located at: Bergville, Vryheid, Waterloo (Verulam) and Nongoma. Although there is little documentation on the individual projects, valuable information was obtained through an interview conducted on 4 September, 2006, with Z Duma, Assistant Manager for LandCare in KwaZulu-Natal.

At all of the project sites, activities have been undertaken to raise awareness of the value of wetlands and the importance of sound wetland management practices. In addition, resources are provided to employ local people to undertake works to address key problems in the wetland. In the case of Waterloo and Nongoma, this consisted of the clearing of alien plants in the wetland. At the Vryheid wetland, rubble that had been dumped in the wetland was cleared and a gabion weir was constructed to help reduce the erosion of the wetland. At the Bergville site, resources were focused on establishing and fencing a garden outside of the wetland to serve as an alternative site for two households that were cultivating in the wetland.

All four projects have shown a significant improvement in the state of health of the wetland. At the Bergville site, the two households that had been cultivating in the wetland moved their cultivation practices to the fenced garden that was established outside of the wetland, and the natural vegetation was re-established in the previously cultivated area. At the Vryheid site, the level of erosion was reduced and the state of health of the vegetation improved once the rubble had been removed. At the Waterloo and Nongoma sites, the abundance of alien invasive plants was considerably reduced. At the Nongoma site, the uncontrolled use of the wetland by cattle was controlled through the fencing-off of the wetland. However, at Waterloo an unintentional outcome of the clearing of alien plants was the cultivation of the cleared areas by local people, and this issue is in the process of being addressed.

It is recognized that improving the state of health of a wetland is not simply a matter of implementing physical measures (e.g. clearing alien plants). Very often it also requires the building of understanding and capacity of the land users themselves and strengthening the institutions responsible for the management controls over the wetland. Failure to address the issues of human capacity and institutional controls can easily lead to the positive effects of the physical measures being lost over time as the wetland is used in an uncontrolled and unsustainable manner. Although difficult to measure, it appears that awareness and understanding has been enhanced at all of the sites. The sites have, however, varied according to the level of success with which the management system of the wetland has been enhanced, and therefore the assurance of the long-term sustainability of the site. At Nongoma, where the LandCare project has worked closely with a well-defined and -organised local group (the local stockowners association), a shared vision for the wetland has been reached and the management system has been strengthened. At Bergville the Traditional Authority has provided a clearly-defined organization through which the management controls are exercised, but the extent to which this has been strengthened is not known. At Vryheid and Waterloo problems have been encountered in terms of the management institutions controlling the use of the wetland. At Waterloo, there has been a conflict of interest and a failure by the different stakeholders to reach a common vision concerning the utilization of the area. At the Vryheid site, the project has been considerably disrupted by the tensions between opposing political parties represented within the local authorities. This disruption has resulted in the project being put on hold even though some of the physical work still required has not been completed. It is probably no coincidence that the two problematic sites are both peri-urban, where control by authorities tends to be more uncertain and hotly contested than in rural areas

obtained by the community members. However, without an investment in the long-term measures, the long-term sustainability of the project and its outcome is generally in question. There is often pressure from both government departments and from within communities to demonstrate short-term results, which generally makes it very difficult for a project to build long-term sustainability. This is also a tension faced by the WfWater, WfWetlands and the LandCare programmes, where it is required that a relatively high proportion of project budgets are to be allocated to local labour. Ideally, short-term and long-term measures need to run in parallel. However, it is easy for the long-term objectives to be subsumed by the short-term objectives. In public works programmes there has been a tendency to neglect the long-term outcomes, such as local economic growth and the enhancement of natural resource conservation (Holden *et al*., 2004; Barrett *et al*., 2004).

Several of the LandCare projects in the Western Cape have been successful in building the local management capacity of commercial farmers (F Steyn and H Germishuis 2006, *Pers comm*. LandCare, South Africa). They differ from the WfWater, WfWetlands and even from many of the other LandCare projects in that the landowner is required to make a considerable contribution to the project. The landowner must take responsibility for recruiting, supervising and transporting the labour at his/her own expense, which in the case of WfWetlands and WfWater is the responsibility of the external contractor. Funding is provided by the state to cover all the costs of the labour, chemicals and equipment, and government departments are responsible for assessing the magnitude of the work required and for monitoring the implementation of the work. Although this approach does not contribute to the economic development of historically disadvantaged contractors, the high level of commitment required by landowners is considered positive from the perspective of long-term sustainability. Generally speaking, the higher the involvement and the greater the contribution of the landowner to a project, the more sustainable are likely to be its outcomes.

Admittedly, the principle of demanding a much higher level of landholder contribution is more difficult to apply where the landholders are poorly resourced and are using land with insecure tenure (e.g. in communally-used areas) than where the landholders are better resourced and have secure title to their land (see Part 2). Even so, there are more mechanisms that can probably be explored to increase the 'own contribution' made by resource-poor farmers, as will be discussed further in Part 2.

In conclusion, LandCare has been successful in enhancing the wise use of wetlands at sites where it has implemented projects, most of which have been under communal ownership. The extent to which the programme has impacted on wetlands beyond the bounds of the project sites is probably not great. LandCare has also contributed directly to wetland rehabilitation, particularly in terms of the clearing of alien plants. This appears to have been most successful in the Western Cape on some private farms, where a high level of contribution by landowners has been achieved. This has provided a useful model for the promotion of the long-term sustainability of rehabilitation interventions.

5.4 Mondi Wetlands Project

The Mondi Wetlands Project (MWP) is a joint project of the WWF (World Wide Fund for Nature), the Wildlife and Environment Society of South Africa and its main sponsor, Mondi Business Paper South Africa, together with Mazda Wildlife Fund.

The MWP was initiated in 1991 and aims to catalyse the rehabilitation, wise-use and sustainable management of South Africa's wetlands. It does so primarily by promoting rural wetland conservation among key government agencies and private and communal wetland users through:

- awareness-raising
- policy work and lobbying
- catalysing partnerships
- research-based tools and resources
- training and on-the-ground support. (Rosenberg and Taylor, 2005)

The Mondi Wetlands Project is regarded as highly successful (Rosenberg and Taylor, 2005) and its main achievements include:

- Partnering Mondi and the forestry industry in the development and implementation of environmental best-practices, including wetland delineation to remove plantations from wetlands and the application of other, appropriate, wetland management policies.
- Strategic participation in policy development in the past decade, including the successful lobbying for a jurisdictional definition of wetlands in the National Water Act, with the potential to facilitate the improved regulation of wetland management.
- Lobbying government agencies to institutionalize wetland conservation and put in place staff and systems for this, including the establishment of the Working for Wetlands programme, which combines poverty relief and wetland rehabilitation.
- A partnership with progressive sugar-cane growers to develop improved environmental management systems for sugar farming. While this initiative is still small-scale, it has attracted positive attention from other grower-groups and the WWF and holds much promise for future environmental best-practice.
- Using and stimulating research to develop new, practical tools and guidelines to support wetland assessment and management.
- Building the competence of key players in the wetland arena including strategically placed government staff.

MWP has passed though three phases and the above achievements are primarily from the third phase. It is interesting to note that none of the items listed above relate directly to outcomes at individual wetland sites, although some are likely to affect wetland sites indirectly. This contrasts with the second phase of MWP that was more strongly grounded within individual wetland sites. This was primarily through the field surveying of wetlands in terms of problems and threats (e.g. artificial drainage channels and erosion gullies) with a total of over 10 000 ha of wetland being surveyed Although the surveys themselves probably did not have much direct bearing on the management of the wetlands surveyed, they did provide an indication of the health status of these wetlands and the problems that could be addressed through rehabilitation in order to improve the status.* This information was useful for informing the planning process of WfWetlands.

As with all programmes working for change in a complex environment, there are some aspects of the MWP that have not worked as well as others. Two issues highlighted by Rosenberg and Taylor (2005) are as follows.

- There is a risk of working in a catalytic way but failing to maintain an involvement in the initiatives which have been catalysed. This includes the loss of an on-the-ground presence and the possible weakening of key partnerships, as well as limiting the effectiveness and sustainability of initiatives.

* The surveys also served as a very useful vehicle for building competency and enthusiasm among individuals recently introduced to wetlands.

- There is limited evaluation and monitoring data, as well as limited criteria for what success on the ground entails, particularly in the context of communal wetlands.

The Mondi Wetlands Programme (MWP) employs only a few staff and covers a large area. It therefore tends to operate mainly at a strategic level, and is limited in the number of individual wetlands in which it can maintain an on-the-ground presence. Another key aspect about the way that MWP operates that makes it difficult to relate its activities to individual wetlands is that it conducts much of its work through acting as a catalyst and supporting the work of others. Its impact is therefore through the work of other organizations that are influenced by a host of other factors including the MWP.

MWP works extensively with the forestry industry and over the last few years there has been considerable withdrawal of tree plantations from within and adjacent to wetland areas. MWP are one of several actors driving the process of withdrawal and although there was general consensus that forestry plantations should be withdrawn from wetlands, a key stumbling block to implementing this withdrawal was a lack of an agreed-upon and a scientifically defensible method for delineating the boundary of a wetland. Here MWP played a critical role (e.g. in facilitating a series of workshops and field days) in bringing together the various stakeholders, including forestry companies, government departments and scientists to arrive at a method that was agreed upon and supported by all of the stakeholders. Alien plants remain an important problem in the wetlands in forestry areas and this needs to be better addressed (as discussed further in Part 2).

MWP has also been working with the sugar industry, which is well-justified given the high impact of sugar-cane production on wetlands and the great potential that exists for improving the health status of wetlands in sugar-cane producing areas (Box 1.2). However, it is probably still too early to expect any meaningful changes on the ground as it is widely recognized that in order to effect meaningful change at the site level, one may need to work for several years at a higher level dealing with key institutional factors that impinge on individual sites.

In conclusion, because the MWP does not focus on individual project sites, the impact of the MWP on wetlands has been less direct than has that of all of the other programmes. A formal evaluation of the MWP (Rosenberg and Taylor, 2005) showed that the greatest contribution that the MWP has made has been in lobbying government departments to give greater prominence to wetland conservation, including the creation of staff posts to carry this out. The MWP has provided further support to these staff through training, mentorship, advice and encouragement. The MWP was also the key organization lobbying for the establishment of Working for Wetlands, which it actively nurtured in its initial stages. Of the different land-use sectors, the MWP has worked most closely with the forestry sector, and through a systematic process, together with several other stakeholders, has encouraged the withdrawal of several thousand hectares of forestry plantation from wetlands.

5.5 The Crane Conservation Programme of the Endangered Wildlife Trust (EWT) and its crane conservation partners

The main partners with whom the EWT work in conserving cranes and their wetland habitats are the KwaZulu-Natal Crane Foundation, the Highlands Crane Working Group and the Wakkerstroom Natural Heritage Association. It is difficult to relate directly much of the work that the EWT has conducted to the health of wetlands. This applies

Box 1.2: The sugarcane industry and wetlands and South Africa: tremendous opportunities for rehabilitation

One of the key land-users responsible for the loss of wetland area, particularly in KwaZulu-Natal, is the sugar-cane industry (Kotze *et al*., 1995). Tens of thousands of hectares of wetland have been drained for sugar-cane production. For example, in the Mfolozi and Mhlatuze Swamps more than 9 000 ha and 4 000 ha respectively have been drained for sugar production (Begg, 1989; Begg, 1990). Over the past 20 years there has been a very slight withdrawal of sugar-cane cultivation from wetland areas immediately adjacent to streamlines but this represents only a very small proportion of the total area of wetland converted to sugar-cane cultivation.

Great potential exists for the rehabilitation of wetland currently under sugar production. However, it is probably unrealistic to expect the same degree of unprecedented withdrawal of area under production from wetlands that has taken place in the timber industry. Firstly, the impact of sugar on the water yield from the catchment is less than that of trees, and therefore the benefits in terms of enhanced catchment yield will be less for sugar. Secondly, the costs to the industry of wholesale withdrawal are likely to be much greater for sugar than for forestry. Thirdly, the sugar industry has been put under less pressure by the South African public and government departments to be more environmentally responsible, than has the timber industry. As the demand for biofuels progressively increases in the future, the pressure to increase the extent of biofuel crops such as sugar-cane may further mitigate against the withdrawal of sugar-cane production from wetlands. However, even if the sugar industry withdrew only 10% of its sugar-cane currently grown in wetlands, this would represent several thousand hectares in a region where the cumulative impacts on wetlands are considerable. If these withdrawal areas were carefully chosen, then the returns in terms of meeting catchment management (particularly considering the potentially polluting effects of fertilizer and biocides applied to sugar-cane within or very close to watercourses) and biodiversity conservation objectives are potentially considerable.

in particular to their work on raising awareness and promoting a basic understanding of wetlands and cranes amongst landowners who collectively own extensive wetland areas. The EWT has not formally monitored the success of their interventions at individual sites. Nonetheless, two main impacts relating directly to the health of wetlands can be linked directly to the work of EWT.

1. A reduction in the cumulative loss of wetlands, particularly that resulting from dams constructed in wetlands.
2. Improved management practices, particularly in relation to burning of wetlands.

A reduction in the cumulative loss of wetlands

In the geographical areas in which the EWT operates, by far the most important land-use resulting in the ongoing loss of wetlands are dams constructed in the wetlands. The EWT has addressed this issue on three fronts (K McCann 2006, *Pers. comm*. Endangered Wildlife Trust, Mooi River).

- Engaging the Environmental Impact Assessment process as an interested and affected party and opposing those applications considered likely to impact significantly on wetlands and crane habitat. While the EWT has not been successful in opposing all the development proposals, their contribution has reduced the number of dams that are built, which impact negatively on cranes and their wetland habitats.
- Work on a one-to-one basis with individual landowners who, after having had their awareness raised, contact the EWT before putting in an application for a dam. The EWT then work together with the landowner to find a solution that

will minimize the impact of the dam on wetlands and cranes (e.g. seeking an alternative site for the proposed dam, raising an existing dam wall rather than constructing a new dam, reducing the size of the proposed dam).

- Initiate and support a strategic planning-process that involves all of the stakeholders and which will allow decisions on new dam applications to be made on a better-informed basis. This process was facilitated by the EWT in the Dullstroom area in Mpumalanga province, where there has been considerable pressure to build new dams for trout fishing.

Improved management practices

Although farmers have seldom needed to change their management practices to better account for cranes, several farmers have become considerably more aware of improved burning practice in wetlands, and have modified their burning regimes accordingly. These changes have not been written into any formal agreement, but are rather based on trust.

Besides influencing the management of landowners, EWT has also had hands-on involvement in minimizing the impact of burning on wattled crane eggs and chicks. Where eggs are present and it is not possible to alter the timing and location of burning to accommodate the hatching of the eggs, the eggs are removed prior to burning and placed in a portable incubator for the duration of the fire and are then replaced immediately afterwards. In the case of chicks, assistance is provided in locating the chicks, catching them where required or, if the chick is located and cannot be caught, trampling down the vegetation into flooded ground to serve as a fire break. These are fairly specialized activities that most landowners could not be expected to undertake themselves (K McCann, 2006, *Pers. comm.*, Endangered Wildlife Trust, Mooi River).

The EWT has also been successful in assisting the improvement in management of a few formally protected wetland areas for cranes. The most important of these is uMngeni vlei in KwaZulu-Natal. Following its declaration as a formally protected area in the late 1980s, the uMngeni vlei was infrequently burned and grazed at a low intensity. With this particular management, the number of breeding pairs of wattled crane in the vlei declined considerably. In partnership with neighbouring farmers, a controlled burning and grazing programme was implemented. Since this change in management, the number of breeding pairs increased substantially (K McCann, 2006, *Pers. comm.*, Endangered Wildlife Trust, Mooi River). In the two years prior to the change in management, only a single pair attempted to breed each year, but by the third year after the change in management, the number of pairs attempting to breed per year had increased to four (Rushworth, 2006).

The EWT has focused their work in specific geographical areas that are important for wattled crane. The specific activities carried out by the EWT vary according to the management needs of the particular geographical area (Table 1.4).

In conclusion, the EWT Crane Conservation Programme has impacted positively on the protection and wise use of wetlands in those geographical areas that are important for cranes (e.g. the KwaZulu-Natal midlands). Through active engagement of the EIA process (reactive) and the engagement of landowners (proactive), the programme has reduced the extent of loss of wetland from deep-flooding by new dams. Through building long-term trust with individual landowners, wetland management (especially burning regimes) has been improved, but this still relies to some extent on the close support of the programme.

Table1.4: Focus areas of the EWT in relation to cranes

Geographical areas of focus	Specific work conducted
KwaZulu-Natal Midlands and the Underberg area	• Enhance the awareness and understanding of landowners
Dullstroom, Mpumalanga province	• Improve management practices, especially with respect to burning • Reduce the cumulative loss of wetlands resulting from new dams
North-Eastern Cape	• Enhance the awareness and understanding of landowners • Identify good candidate-sites for wetland rehabilitation
Wakkerstroom, Mpumalanga	• Enhance the awareness and understanding of landowners • Improve management practices, especially with respect to burning
Memel vlei, Eastern Free State	

6 Impacts of NRMPs within different sectors That affect the health of wetlands

A key problem common to all of the programmes included in the assessment is a deficiency of the monitoring and evaluation of the achievement of outcomes at individual sites. This makes it difficult to draw any specific, well-substantiated conclusions, although some general conclusions can nevertheless be drawn. These general conclusions have as far as possible been validated from different sources.

In the forestry sector there has been a substantial commitment to the withdrawal of timber plantations from within and immediately adjacent to wetland areas. For example, since 1998 Sappi Forests has withdrawn approximately 3 900 ha of plantation from wetland areas and their associated buffers (D Macfarlane, 2006, *Pers. comm.*, SHEQ Manager, Sappi Forests, Pietermaritzburg). As elaborated on in Section 5.4, this withdrawal has been in response to a number of factors that includes NRMPs and pressure from government, the public and international market. The anticipated improvement in the health status of wetlands resulting from this withdrawal has, however, been tempered by the inadequate control of invasive alien plants, which tend to very rapidly colonise within the withdrawn areas. Thus the considerable commitment to withdrawal of forestry plantations has not been matched by the commitment to the clearing of alien plants, which is lagging far behind. From the forestry producers' perspective, withdrawal is a double cost because an increased alien plant clearing burden is added to the opportunity costs of no longer producing timber in the withdrawn areas. The most efficient means of controlling alien plants is to commence control while infestation levels are still low. Thus, in order to promote efficient recovery of wetlands, a possible option would be to temporarily slow down the rate of withdrawal to allow the alien plant control programme to 'catch up'.

In the sugar-cane sector, the planting of untransformed wetland areas to sugar-cane has largely not taken place since the enactment of CARA (Conservation of Agricultural Resources Act) in 1983. However, the withdrawal of production from wetlands already planted to sugar-cane has been minimal, and therefore there has been very little improvement in the health status of cultivated wetlands within sugar areas. Work has been under way at a strategic level to reduce the impact of sugar-cane production on wetlands, as discussed in Section 5.4, and this will

hopefully bear fruit in the next few years.

In the subsistence and small-scale agriculture sector there have been some localized positive impacts but overall NRMPs have most likely only made a very small impact on the health status of wetlands in this sector. In the commercial agriculture sector, which covers the largest area, success has been achieved in certain regions and at localized sites. Although not dealt with specifically in this assessment, a programme which appears to have been very successful in the commercial agriculture sector is the Conservancy Programme.*

Effecting widespread positive change amongst land users is a difficult process, influenced by a variety of factors. Three important factors are the extent to which the sector is subject to outside pressure for change, the number of actors one is trying to influence and the inter-linkages between these different actors (Figure 1.4).

Much of the area under forestry is owned by a few major forestry companies. These companies are also fairly well-connected, e.g. through their joint membership of both FSC (Forestry Stewardship Council) and Forestry SA. By comparison, in the sugar industry, although a few companies hold a sizable proportion of the sugar-producing land, there are many medium-sized growers, as well as tens of thousands of small-scale growers. Far more than any other sector, forestry has been under great external pressure from three sources: (1) government departments, (2) international markets and (3) some of the public who view tree plantations as wasteful of South Africa's precious water and a major threat to biodiversity. The sugar industry has been under less pressure from all three of these sources, although the pressure appears to be increasing. Sugar farmers are linked through their focus on a single, nationally and internationally traded product, almost all of which is directed through a few mills spread across the sugar-producing areas of South Africa. The links are also strengthened by the Sugar Association of SA, an umbrella organization that is influential in setting environmental standards within the industry.

Although there are some companies engaged in commercial mixed agriculture, the bulk of the land in the agricultural sector is held by individual farmers, who number several thousand. These farmers produce a diversity of agricultural products, including vegetables, cereal crops, livestock, milk etc. Markets range from local to international. At a local level commercial farmers may be organized into farmers' associations and at provincial and national level commercial farmers are represented by an overarching body, Agri SA. However, at all levels these organizations appear to focus on issues such as security, land reform and land taxation, with little attention given to environmental issues. Overall, the agricultural sector has been subject to moderate outside pressure for change, mainly from government departments.

Small-scale farmers are by far the most numerous of the different sectors. Subsistence farmers are often very well-linked at the local neighbourhood level, and in many cases more so than are commercial farmers. Beyond this, however, linkages tend to be poorly developed between subsistence farmers, whose markets tend to be very local. Overall, the small-scale farming sector has been subject to the least outside pressure to change, with government departments largely taking a 'hands-off' approach to this sector with regard to wetlands.

* The objective of a conservancy is to harness local interest in wildlife to combine the joint resources of landowners to achieve shared conservation objectives. Conservancies work in collaboration with the provincial conservation organization and are overseen at national level by a Conservancy Association.

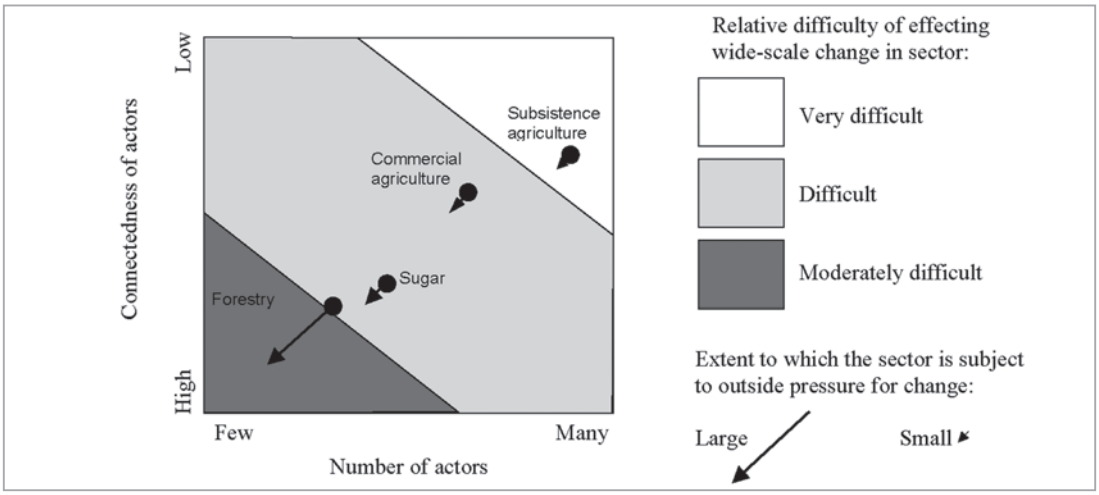


Figure 1.4: Difficulty of effecting widespread change within a sector, based on the number of actors, level of connectedness of the actors and the outside pressure for change.

7 A summary of the impact of NRMPs on the management-effectiveness of individual wetlands

A preliminary assessment is presented in Table 1.5 of how the NRMPs have impacted upon the management-effectiveness of individual wetlands, based upon the criteria given in Part 2, Section 2.2.

The fact that the contribution of NRMPs to several of the elements given in Table 5 is low is not an indication that the programmes have not been successful. The focus of Table 1.5 is at the level of the individual wetland, and many of the achievements of a programme may be at a higher level. The MWP is regarded as one of WESSA's most successful programmes (J Taylor, 2006, *Pers. comm.*, Wildlife and Environment Society of South Africa, Umgeni Valley, Howick). Similarly, WfWetlands is widely regarded as one of the most successful programmes in the Expanded Public Works Programme (G Preston, 2006, *Pers. Comm.*, Working for Water, Cape Town). These two programmes in particular have played a significant role in raising the profile of wetlands and in institutionalizing wetland conservation. Many of the effects of these programmes on individual wetlands may still be realised in the future. Across most of the provinces, one of the key features that Department of Environmental Affairs officials now routinely check for in a development application is whether adequate consideration has been given to any wetland areas that will potentially be impacted upon by the proposed development. While there is still room for improving this process, it currently takes place to a much greater extent than previously. Furthermore, several of the provinces have over the last number of years created a post dedicated to wetlands, for which MWP had been lobbying for several years. Notwithstanding these achievements, Table 1.5 assists in identifying several areas which require improvement, and which are given at the end of Part 2 of this document.

Table 1.5: A summary of the impact of the Natural Resource Management Programmes on the management-effectiveness of individual wetlands in South Africa

Elements of management-effectiveness	Contribution of resource management programmes to improving the management-effectiveness at the scale of individual wetland sites	
Protection status	Low	NRMPs have contributed to improving the protection status of only a very few individual wetlands (e.g. through declaration as a nature reserve). They have, however, contributed to generally raising the profile of wetlands and the attention that wetlands receive when the impacts of proposed developments are assessed.
Setting of management objectives & developing a management plan	Moderately low	NRMPs have contributed within the forestry sector to the setting of management objectives and establishing management plans. Other sectors have been little affected. In some wetlands rehabilitated by WfWetlands, a contribution has been made by the programme to the setting of objectives and to drafting management plans. However, the norm is to rehabilitate wetlands with little contribution being made to explicit management objectives and plans.
Allocation of resources	-	NRMPs generally do not allocate resources as this is the responsibility of the landholders. Nevertheless, NRMPs have influenced the amount of resources that are allocated. Of particular note are the considerable government resources allocated to the rehabilitation of wetlands.
Capacity for management	Intermediate	Training has been provided widely by MWP to key individuals in middle management within government departments as well as to fieldworkers, which has helped build their capacity. This is an important achievement. However, the principal focus of the training has been on biophysical, technical aspects of wetlands (e.g. wetland delineation, ecosystem services assessment, design of rehabilitation structures etc.). Very little training has focused specifically on management (e.g. how to set objectives) and the institutional factors encompassed in management. The extent to which the individuals receiving training have, in turn, contributed to building the capacity of managers is not known but is probably not considerable. Direct building of capacity of managers appears to have taken place mainly within nature conservation bodies and forestry companies.
Commitment from managers	-	Although NRMPs have lobbied for increased commitment from managers, the commitment itself is not considered the responsibility of outside programmes.
Stakeholder involvement	Intermediate	NRMPs are well positioned to increase stakeholder involvement, and have been generally successful in exposing wetland managers and other stakeholders to new outside linkages.
Co-operation between parties	Intermediate	Outside facilitation. Largely confined to a few isolated sites.
Addressing pressures and threats	Intermediate	Directly by stabilizing erosion and clearing alien plants. However, little has been done to address the threat of competing water use and loss of wetland area
Controlling inappropriate activities	Low	This has been achieved primarily through the building of capacity and through lending support to the regulatory authorities rather than through direct control.
Benefits to local people	Intermediate	Although the short-term benefits to local people are often high due to job creation opportunities, the long-term benefits are much lower, but nonetheless still evident (Nkoko and Macun, 2005). There has only been a contribution towards enterprise development (e.g. based on wetland plants) for a very few wetlands.
Achievement of management objectives	-	It is not the direct responsibility of NRMPs to develop management objectives. Nevertheless, NRMPs can play an important role in lobbying land-users (especially those that are well-networked) to be accountable for meeting their management objectives.
State of health of the wetland	Moderate	The contribution to the health status of the wetland has been primarily through the implementation of physical rehabilitation measures rather than through improving control over impacts on the wetland.
Monitoring	Moderately low	Some success in monitoring and evaluation has been achieved at isolated sites (as elaborated upon further in Part 2) and within the forestry industry generally.
Evaluation and learning		

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Part 2
A framework for assessing the effectiveness of wetland management (*WET-EffectiveManage*) as described and applied to 21 wetlands

Kotze DC and Breen CM

1 Background and conceptual framework of the study

1.1 Introduction and purpose of the study

Although the planning of management activities has been a long-established process within many conservation agencies, the evaluation of the impact or effectiveness of management activities is still in its infancy. Even where there is provision for the revision of management activities, data are seldom available on the effectiveness of previous management activities that can be used as a basis for the review of the management activity plans (Hockings, 1998). This widespread failure to measure progress and to learn through adaptive management has prompted the development of several systems for measuring the impact of management activities, with many tailored for specific regions or habitats (Hockings, 1998).

One of the requirements of the Water Research Commission project on Wetland Rehabilitation was to conduct an assessment of the impact of natural resource management programmes on the status of wetlands in South Africa. What is apparent from this requirement is a focus on improving the status of individual wetlands. The question of whether wetland conservation initiatives are effective in achieving their goals, although a difficult question to answer, is one that should be asked. It is recognized that before the question of the effective achievement of goals can be answered, criteria need to be developed for evaluating the effectiveness of management. Rather than 'reinventing the wheel', a review of existing systems was undertaken to extract these criteria (Taylor and Kotze, 2004).

1.2 A framework for the assessment of management effectiveness

Based on a review of the literature, a system for the effective management of ecosystems should be underpinned by the following elements:

- It should be **strategic** in the sense that it is guided by a vision and objectives and the implementation of actions necessary to achieve these (Rogers and Bestbeir, 1997; Rogers and Biggs, 1999).
- It should be **adaptive** in the sense that there is an ongoing process of monitoring and evaluation and adjustment to account for the lessons learnt (Holling, 1978; Mackenzie *et al*., 2003).
- It should be **inclusive** of the key stakeholders that affect and are affected by the ecosystem (Olsson *et al*., 2004; Ramsar Convention on Wetlands, 2004).

These basic elements are encapsulated in what is referred to as Strategic, Adaptive Co-management (SAC).

Management is strategic in the sense that it has direction. Strategic management is commonly put into operation through an objectives hierarchy, which begins with an overall management vision from which a series of management objectives are derived. These in turn are each translated into a set of specific management actions (Rogers and Bestbier, 1997).

In response to failures in the command-and-control approach to ecosystem management, which attempted to maintain the stability of inherently dynamic systems, an adaptive approach is now being widely advocated (Rogers and Bestbier, 1997). Adaptive management is a structured process of ongoing 'learning by doing' (also

described as 'management by experiment'), where management actions are treated as potential learning opportunities (Walters, 1997; Rogers and Biggs, 1999; Mackenzie *et al*., 2003). This is achieved through monitoring the outcomes of management actions, reflecting on these outcomes and then adjusting future actions accordingly (i.e. a reflexive approach). Successive cycles of action, monitoring and reflection thus lead to a progressive improvement in management competency. Adaptive management allows for flexibility in response not only to the dynamics of ecosystems but also to uncertainties and changes in the interests of stakeholders, the political climate and in resources available to management (The Ramsar Convention on Wetlands, 2004). Environmental issues are value-laden, and an understanding of the issues is shaped by the different, often conflicting, interests of society. Thus a critical approach is required where, during each reflection, issues and assumptions are questioned, which allows one to remain responsive to different contexts (Taylor, 2007).

Adaptive management is a similar process to what the Open Process Framework terms 'action learning' (UNEP, 2004), which promotes learning processes that are responsive, flexible and participatory. The framework seeks to mobilize the prior knowledge and understanding that participants bring into situations through encouraging participants to gather contextual information and to question, explore and experiment. It is then possible to take meaningful action and report on learning processes in ways that can lead to social change (Taylor, 2007).

Models are widely used in strategic adaptive management to make predictions of the effects of alternative scenarios of action (Walters 1997). By investigating the effects of a number of scenarios in relation to the management objectives, management becomes strategic rather than reactive. Models do not have to be complex and numerical; they may be based on a few simple rules reflecting observed empirical relationships between management tools (e.g. timing of burning) and management outcomes (e.g. suitability for a particular species).

In addition, many management objectives are long-term, and the achievement of milestones along the way needs to be assessed so that the necessary adjustments can be made rather than arriving at the endpoint to find that the results are far from the targets set in the objectives. Also, when activities do not yield the intended outcomes, it may be because the initial goal was inappropriate.

The third foundation element is inclusiveness, which has gained increasing prominence over the last decade or so. The Ramsar Convention on Wetlands (2004) states that:

> "Wetland management, and particularly the planning process, should be as inclusive as possible. Legitimate stakeholders, particularly local communities and indigenous people, should be strongly encouraged to take an active role in planning and in the joint management of sites...
>
> A stakeholder is taken to mean any individual, group or community living within the influence of the site, and any individual, group or community likely to influence the management of the site. This will obviously include all those who are dependent on the site for their livelihood."

It should be highlighted that, as elaborated upon in Part 3, Table 3.1, inclusiveness is not confined to keeping all involved parties informed or consulting them but also includes working together and learning together as partners.

In recognising the need for a generic approach to assessing management effectiveness, the World Commission

on Protected Areas (WCPA) developed an evaluation framework (Hockings *et al.*, 2000). Assessing management-effectiveness requires the inclusion of a number of components, which are applied in the following sequence (Hockings *et al.*, 2000; 2001). The components should:

1. check that management is being placed in its broader policy/legislative context
2. ensure that ca baseline description of the system (e.g. an individual wetland) has been undertaken and that the key issues relevant to management have been identified
3. set management objectives
4. develop and implement an action plan for achieving the objectives
5. ensure that the meaningful participation by local communities and other stakeholders in management is achieved
6. monitor and evaluate all of the above (i.e. both outputs and outcomes)

These six components can be disaggregated further into sub-components for evaluation, as is elaborated upon in Section 2.2. This framework was recognized as being useful for assessing the effectiveness of natural resource management, and the three key foundation elements (strategic, adaptive and inclusive) are well-incorporated into the framework (Taylor and Kotze, 2004).

2 Methods

2.1 Choosing the most appropriate level of assessment

Hockings *et al.* (2000) outline three levels at which the six components of the framework can be assessed (Figure 2.1). The three levels differ according to the level of detail of the assessment and to which components receive particular emphasis (Figure 2.1):

- Level 1 requires the least data collection, and mainly uses readily available information. Emphasis is placed on the elements of context, planning, inputs and processes of management. Assessments are generally applicable across a variety of sites or programmes, rather than being specifically adapted to the specialist needs of individual sites. Assessment relies mainly on reports and the informed opinion of managers.
- Level 2 combines the approach in Level 1 with the addition of the monitoring of outputs and outcomes of management activities specific to the site.
- Level 3 places emphasis on both outputs and outcomes and is generally aimed at a site level. Measures of the other components are also included.

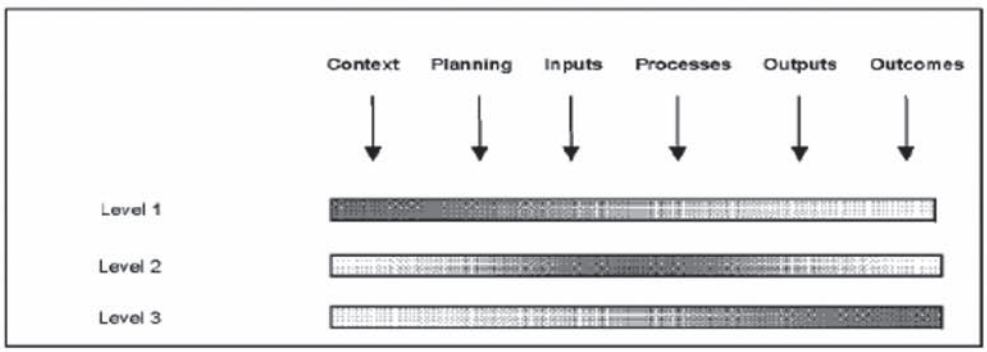

Figure 2.1: Level of assessment of management effectiveness, with darker shading indicating greater emphasis (From Hockings *et al.*, 2000).

Although Hockings *et al*. (2000) describe three levels of assessment for use in protected areas, only a single level of assessment is presented in this document and it equates approximately to the Level 2 described by Hockings *et al.* (2000).

2.2 Translating the six-component framework into a scoring system

The scoring system, referred to as *WET-EffectiveManage,* is structured as a questionnaire, which is based on that given in Hockings *et al.* (2001) and includes an explanation of each question and its underlying assumptions (Table 2.1). It aims to be as transparent as possible and to emphasise that the researcher is open to dialogue and reflection - thus inviting participation from respondents. An important aspect of the questionnaire is that it is not designed simply to extract information from participants but also to promote learning by both the researcher and the respondents as they work through the questionnaire together. Thus, as far as possible an attempt was made to administer the questionnaire in a spirit of openness and based on one-to-one interviews in order to encourage an interactive process.

The questionnaire, given in Table 2.1, consists of 15 questions encompassing all of the management effectiveness components presented in Figure 2.1. For each question, the respondent assigns a score of 0, 1, 2 or 3 based on which of the criteria descriptions best fits the situation at the site being assessed. In addition, for each question, the respondent is invited to provide any additional comments.

Table 2.1: *WET-EffectiveManage*: a set of indicators and criteria for scoring management effectiveness

Indicators	Criteria	Score
1. Protection status (*Context*) What is the wetland's protection status?	The wetland has no protection status	0
	The wetland has limited protection status but it is not legally binding (e.g. Natural Heritage Site) or in the case of multiple ownership only a small portion of the wetland is protected	1
	The wetland has partial protection status (e.g. protection is written into the site's deed of sale) or in the case of multiple ownership, only some of the wetland is protected.	2
	The entire wetland has been legally gazetted as a protected area	3
2. Setting of management objectives *(Planning)* Have explicit management objectives been set that represent stakeholder interests?	No explicit management objectives have been set for the wetland	0
	Some explicit management objectives have been set but they do not well-represent the interests of stakeholders	1
	Explicit management objectives have been set that represent the interests of stakeholders moderately well	2
	Explicit management objectives have been set that represent the interests of stakeholders very well	3
3. Management plan *(Planning)* Is there a management plan for achieving the objectives?	There is no management plan for the wetland	0
	A management plan exists but it is very seldom used	1
	A management plan exists and is occasionally used but is seldom, if ever revised	2
	A management plan exists and is being regularly used and periodically revised to incorporate new learnings and altered circumstances	3
4. Allocation of resources to management of the wetland *(Inputs)* Is the current allocation of resources meeting the management needs of the wetland?	There are no resources allocated specifically for management of the wetland	0
	The available resources are inadequate for management needs (as specified in the management plan, if present)	1
	The available resources are acceptable, but could be further improved to fully achieve effective management	2
	The available resources meet the full management needs of the wetland	3

5. Capacity for management of the wetland *(Inputs/capacity)* Is the human capacity meeting the needs of management of the wetland?	The capacity for managing the wetland is very low	0
	There is some capacity present but it is inadequate for basic management needs	1
	The capacity is reasonable but could be further improved to fully achieve effective management	2
	The capacity meets the full management needs of the wetland	3
6. Commitment from the managers (Process) Is there a commitment to the management of the wetland?	Little or no commitment to meeting the management needs of the wetland	0
	Some commitment demonstrated, but this is limited or fluctuates	1
	A high level of commitment demonstrated most of the time	2
	A high level of commitment demonstrated even under difficult circumstances	3
7. Breadth of stakeholder involvement *(Process)* Is there involvement with key stakeholders, particularly those from local communities?	There is no contact between managers and other stakeholders	0
	There is involvement with one or a few of the stakeholders but several stakeholders are not involved	1
	There is involvement with most of the stakeholders except for a few key stakeholders	2
	There is involvement with the majority of stakeholders and good account is taken of stakeholder issues	3
8. Co-operation amongst the different involved parties *(Process)* What is the level of co-operation between the different parties contributing to the management of the wetland?	Different parties work independently and are poorly informed of each others work	0
	Different parties are reasonably well informed of each others work but co-operation is limited	1
	The different parties are well informed of each others work and seek opportunities for co-operation.	2
	The different parties are well informed of each others work and achieve effective collaboration.	3
9. Addressing pressures & threats *(Process)* Is the wetland managed for the threats and pressures it faces?	The pressures and threats facing the wetland are not known	0
	The pressures and threats facing the wetland are known but are not being addressed	1
	The pressures and threats facing the wetland are being addressed but insufficiently to meet the management objectives of the wetland	2
	The pressures and threats facing the wetland are being well-addressed so as to meet the management needs of the wetland	3
10. Mechanisms for controlling inappropriate activities *(Process)* Are inappropriate land-uses and activities (e.g. poaching) controlled?	There are no mechanisms for controlling inappropriate land-use and activities in the wetland	0
	Mechanisms for controlling inappropriate land-use and activities in the wetland exist but there are major problems in implementing them effectively	1
	Mechanisms for controlling inappropriate land-use and activities in the wetland exist but there are some problems in effectively implementing them	2
	Mechanisms for controlling inappropriate land-use and activities in the wetland exist and are being effectively implemented	3
11. Benefits to local people *(Outcomes)* Is the wetland providing economic benefits to local communities?	The existence of the wetland has reduced the options for economic development of the local communities	0
	The existence of the wetland has neither damaged nor benefited the local economy	1
	There is some flow of economic benefits to local communities from the existence of the wetland but this is of minor significance to the regional economy	2
	There is a significant or major flow of economic benefits to local communities from activities in and around the wetland (e.g. employment of locals, locally operated commercial tours etc)	3

12. Achievement of management objectives *(Outcomes)* How well are the management objectives being achieved?	Poorly	0
	Somewhat poorly	1
	Fairly well	2
	Very well	3
13. State of health of the wetland *(Outcomes)* What is the state of health of the wetland?	Poor	0
	Fair	1
	Good	2
	Very good (Natural)	3
14. Monitoring *(Planning/Process)* Is effective monitoring of management and its outcomes taking place?	There is no monitoring of the wetland	0
	There is some *ad hoc* monitoring, but no overall strategy and/or no regular collection of results	1
	There is a well-planned and implemented monitoring system but the results are not used systematically for management	2
	There is a well-planned and implemented monitoring system and the results are used systematically for evaluation of management	3
15. Evaluation and learning *(Process)* Are managers reflecting on how effectively management objectives are being achieved?	Managers very seldom reflect on how effectively the management objectives are being achieved	0
	Managers occasionally reflect on how effectively the management objectives are being achieved	1
	Managers regularly reflect on how effectively the management objectives are being achieved and are moderately effective in identifying areas for improvement	2
	Managers regularly reflect on how effectively the management objectives are being achieved and are very effective in identifying areas for improvement	3

Table 2.1 continued

Assumptions and further explanations for each of the 15 questions
1. Protection status: A wetland with a protected status would reduce the likelihood of inappropriate activities within the wetland, thereby contributing to the effectiveness of its management. Protection is not confined to documented agreements but also includes local protection measures (e.g. those enacted through Traditional Authorities). Even if this protection is not legally binding it helps give status to the wetland and increase interest in maintaining the wetland in as good a state as possible. It is nonetheless recognised that a high protection status is by no means a guarantee that the state of health of the wetland will be maintained, particularly when harmful off-site activities take place (e.g. water abstraction upstream of the wetland).
2. Setting of management objectives: Clear and agreed-upon management objectives that reflect stakeholder interests provide a critical point of reference against which management can be assessed to determine its effectiveness. It is recognised, however, that setting management objectives provides no guarantee that the actions required to meet the objectives will be identified and implemented.
3. A management plan: While management objectives are very useful (see indicator 2) they do not provide explicit management actions. A management plan therefore provides a valuable means of assisting in translating the objectives into practical management actions. It is further assumed that a management plan that is regularly used and periodically updated to account for new understanding will make a greater contribution to management than a static management plan that is seldom referred to. It is nonetheless recognised that effective management systems may be in place (e.g. traditional floodplain grazing systems that are responsive to seasonal and inter-annual variation in the hydrological state of the floodplain) without a formally documented plan. These are equally valid, although more difficult for an outsider to evaluate.
4. Allocation of resources for management of the wetland: If sufficient resources are allocated to carry out the actions specified in the management plan, then this will increase the likelihood of effective management. It is, of course, recognised that many other factors also impinge on the effectiveness of management. If the plan itself is poor, an abundance of resources may be of little help.

5. Capacity for management of the wetland: The greater is the available human capacity, the greater the likelihood of effective management. Again, it is recognized that many other factors (e.g. available resources, commitment etc.) impinge on the effectiveness of management.

6. Commitment from the managers: The greater is the commitment from managers, the greater the likelihood of effective management. This recognizes that management is a human process, and if there is a high level of commitment then much can be achieved even with limited available resources. Nonetheless, commitment alone will not be enough in itself to ensure effective management.

7. Breadth of stakeholder involvement: The greater the extent to which stakeholders are involved in the management of the wetland, the broader will be the base for support of the management and health of the wetland. If the wetland is being managed in the interests of one or a few stakeholders, and key stakeholders, particularly local communities, are excluded then the future state of the health of the wetland could be under significant threat if. It is recognized, however, that the quest for broad and extensive participation can become an end in itself, and can shift the focus away from the management of the wetland itself.

8. Co-operation between the different involved parties: The management of many wetlands requires the input of different organisations, and if their level of co-operation is high, then the likelihood of effective management will be increased. It is recognised, however, that achieving collaboration (e.g. through establishing a special forum) may divert attention away from the management of the wetland itself.

9. Addressing pressures and threats: If pressures and threats are adequately accounted for, then the likelihood of effective management is increased. This may be through the implementation of rehabilitation measures (e.g. blocking artificial drains and halting the advance of gully erosion into a wetland) or through better control of land-use activities. Addressing threats (potential future pressures) implies that the wetland will be more likely to remain in a healthy state for at least some time into the future. It is recognised, however, that this assumption may not hold where there are pressures and threats which are present but have been overlooked. Pressures refer to human impacts currently impacting negatively on the health status of an ecosystem, while threats refer to such impacts potentially occurring in the future.

10. Mechanisms for controlling inappropriate activities: An increase in the extent to which inappropriate land uses are controlled would increase the likelihood of effective management. It is recognised, however, that this assumes that the harmful activities are known.

11. Benefits to local people: If the wetland is a liability from the perspective of local communities, then its future state of health is likely to be far less assured than if the wetland was contributing significant and positive economic benefits to local communities (i.e. conservation through beneficiation). Local communities are particularly important because they are most directly positioned to influence the state of health of the wetland, either positively or negatively and they therefore must be considered. It is recognized, however, that in promoting particular benefits for local communities (e.g. access to certain natural resources) the state of health of the wetland may to some extent be compromised.

12. Achievement of management objectives: It is assumed that if the management objectives are being achieved then management is effective. It is recognized that this depends on the extent to which the management objectives address factors impacting negatively on the wetland. If key factors are not addressed in the management objectives then achievement of the objectives would be no guarantee that management is effective.

13: State of health of the wetland: Improving or maintaining the state of health of the wetland is the object of management. If the wetland is being managed towards a natural state, then this will be the ultimate test of management effectiveness. It is, however, recognised that a wetland may be in a good state of health not because of any specific way in which it is managed but largely because it 'falls outside the path of any developments'. It is important to also emphasize that management of a wetland may be towards a transformed rather than natural state. In such cases it would be possible for management to be effective (e.g. as reflected in achieving the objective of controlling erosion) but for the wetland to be in a poor state of health.

14. Monitoring: If monitoring is carried out and used in the context of adaptive management then this serves the critical function of directing management in such away as to keep it aligned with its objectives and, if required, to also adjust objectives. This, in turn, will promote effective management. It is assumed that monitoring is generally best carried out where the results, interpretations and adjustments are documented. It is nonetheless recognised that the process of monitoring may be undertaken in an effective manner but without formal documentation (e.g. by a farmer who closely observes the response of his/her wetland's vegetation structure to livestock grazing). Such a non-documented process is, however, much more difficult to evaluate 'from the outside' but should at least be carried out using some form of structured process.

15. Evaluation and learning: Wetlands and the factors which affect wetland health generally change over time, as does understanding a particular wetland and its response to these factors. Thus management that involves reflecting on the effects of management actions in relation to the management objectives, and that is open to a changing situation, is more likely to be effective than management that is closed and fixed.

2.3 Choosing the study sites and administering the questionnaire

The number of wetlands that were included in the assessment was restricted because of the limited available resources. Thus, a stratified sampling approach was employed to include a diversity of land-tenure contexts. Sites were also selected from different provinces across South Africa (Table 2.2). A high proportion of sites under communal tenure was purposely chosen because this form of land tenure is recognized as being the most complex and therefore difficult to influence from a management perspective.

Table 2.2: Study sites included in the investigation

Wetland	Land tenure system	Authority	Province
Mohlapetsi	Communal	Traditional Authority	Limpopo
Moro	Communal	Traditional Authority	Limpopo
Craigieburn	Communal	Traditional Authority	Limpopo
Lake Fundudzi	Communal	Traditional Authority	Limpopo
Bodibe	Communal	Traditional Authority	North West
Mbongolwane	Communal	Traditional Authority	KwaZulu-Natal
Kadishe	Communal	Traditional Authority	Mpumalanga
Draaikraal	Communal	Traditional Authority	Mpumalanga
Wakkerstroom	Mixed: communal townlands – leased	Municipality	Mpumalanga
Mkhuze	Mixed: communal and formally protected	Traditional Authority; Provincial conservation agency; Greater St Lucia Wetland Park Authority	KwaZulu-Natal
Edith Stephens	Mixed: communal townlands and formally protected	City of Cape Town, National Biodiversity Institute	Western Cape
Soshanguve	Mixed: communal townlands and formally protected	Tshwane Municipality	Gauteng
Kruisfontein	Private	Single individual farmer	KwaZulu-Natal
Faber's Hill	Private	A forestry company	KwaZulu-Natal
Nyamvubu	Private	Single individual farmer	KwaZulu-Natal
Hlatikulu	Private	Several individual farmers	KwaZulu-Natal
Kromme River	Private	Several individual farmers	Eastern Cape
Ntsikeni	Formally protected state land	Provincial conservation agency	Eastern Cape
Memelvlei	Formally protected state land	Provincial conservation agency	Free State
Rietvlei	Formally protected state land	Provincial conservation agency	Gauteng
Molopo	Formally protected state land	Provincial conservation agency	North West

A common feature of all the sites is that there has been some form of intervention by one or more outside agents to improve the state of the wetland. Most of the sites have undergone some form of rehabilitation to improve their physical state. It must be highlighted therefore that the sites chosen for this study are not a representative sample of all the wetlands in South Africa. Many of South Africa's wetlands have received no, or very little, attention from organizations which promote the conservation and rehabilitation of wetlands in South Africa.

Respondents were chosen based on the extent of their knowledge of the site. For each site assessed, the questionnaire was administered with the respondent on a one-to-one basis. However, where this was not possible, the researcher explained the questionnaire and its rationale to the respondent, who then completed it in his/ her own time.

Respondents were requested to complete one questionnaire for the situation prior to the intervention and one for the situation after the intervention. This allowed the researcher to establish whether or not the interventions had resulted in more effective management. In two of the 21 cases, the respondents indicated that they lacked sufficient knowledge of the 'before situation', and here only the 'after situation' was scored.

In order to place the management effectiveness questions in context, a few questions were also posed on the specific interventions at the wetland site (including the reasons for intervention at the site, the intended outcomes of the intervention, the extent to which outcomes were achieved and the lessons learnt) (Appendix 1).

It is acknowledged that the assessment represents the particular perspective of the respondent. However, for several sites, multiple perspectives were obtained by soliciting comment on the assessment from other individuals also familiar with these site. Although the depth of the study prevented a full investigation of different actors' perspectives, at a few of the sites more detailed investigations had been undertaken and these were referred to in order to provide greater depth of understanding on the sites. These more detailed investigations included Mohlapetsi (Ferand, 2004; Kotze, 2005), Craigieburn (Pollard *et al*., 2004), Mbongolwane (Kotze, 1999; Kotze *et al*., 2002), Wakkerstroom (Nkosi, 2005), Hlatikulu (Nxele, 2006) and Ntsikeni (Nxele, 2006).

3 Results

3.1 A brief reflection on the usefulness of the questionnaire

Before reporting on the results of the questionnaire, a reflection is given on the usefulness of the questionnaire in its application to this study based on the following:

1. How well the question were understood by respondents, based on feedback from the respondents
2. How well the content of the questions covered the key management issues that emerged at the sites examined, based on:
   - Key elements missing from the questions
   - Superfluous/ redundant elements

How well the questions were understood

Most respondents reported few problems with completing the questionnaire. However, some problems were encountered, and these included the following:

1. Some respondents were unclear as to who the managers were, and this was particularly relevant to questions 5 and 6. This uncertainty applied in particular to communal areas, where the so-called management authority had little control over land-uses in the wetland. It also applied to many formally protected areas. In these situations, respondents often seemed to be focused on the field-manager level, forgetting that management also includes higher-level managers responsible for the allocation of resources. The question of '*Where does the control reside?*' needs to be given more explicit attention. Management may be spread across several levels, or concentrated only at lower levels. If it was concentrated only at higher levels, there would in fact be no way of implementing management decisions. Based on the above observation, the questions relating to managers were therefore interpreted with caution.
2. The interpretation of what constitutes co-operation varied between respondents. In some cases where co-operation was scored high, a deeper probing revealed that it was often more a case of a single actor co-ordinating the activities of other actors, rather than the actual co-operation or collaboration of several actors.

The content of the questions

While the questionnaire covered the issue of how broadly the objectives represent different stakeholder interests, some respondents raised the issue that it did not capture how explicitly the management objectives were stated (i.e. ranging from unclear to very clear).

An institutional structure for administering management was not explicitly included in the questionnaire. It was assumed that this would be reflected in the elements dealing with the management process (e.g. co-operation between the different involved parties). In this example it would be assumed that if the required institutional arrangements were in place then the co-operation between the different parties involved would be effective. It is recognized, however, that the robustness of different institutional arrangements will vary greatly.*

Some wetlands which were known from the more detailed studies to provide much lower direct benefits than other wetlands also scored in the highest class in terms of the provision of direct benefits to local people. From this it is concluded that for the descriptor 'provision of direct benefits', the class descriptions are such that it is too easy to score a moderately high or high, and the class allocations should therefore be revised.

Overall reflection on the questionnaire

In applying the questionnaire to the study sites, some limitations of the questionnaire that were revealed are highlighted above. Despite these limitations, the questionnaire is considered to be generally sound and the results valid, provided that the limitations are considered when interpreting the results of the questionnaire.

* Anderies *et al*. (2004) provide a framework for assessing how robust different institutional arrangements for managing ecosystem resources are likely to be. A robust system's performance will not drop off as rapidly as its non-robust counterpart when confronted with external disturbance or internal stress (Anderies *et al*., 2004). They identified eight key principles of long-enduring (i.e. sustainable) institutions governing sustainable resources. These are based on extensive fieldwork and extensive case-study literature and on the growing theoretical literature on institutions. An example of one of these principles is as follows: users who violate rules-in-use are likely to receive graduated sanctions (depending on the seriousness and context of the offense) from other users, from officials accountable to these users, or from both.

3.2 Results in relation to the 15 components identified for assessing management effectiveness at wetland sites

The results for each of the 21 sites are given in Appendix 2.2, and summarised in Table 2.3. The results for each of the 15 components of management are discussed below.

Table 2.3: Mean score values for different tenure types of different components of management effectiveness

Tenure type:	Communal			Mixed			Private			Protected		
Assessment period: and sample size:	B n=7	A n=8	C	B n=4	A n=4	C	B n=4	A n=5	C	B n=4	A n=4	C
1. Protection status	0.1	0.4	+0.3	1.3	1.3	0.0	0.5	0.8	+0.3	2.0	2.8	+0.8
2. Management objectives	0.4	1.4	+1.0	0.7	1.3	+0.6	0.8	1.8	+1.0	0.5	2.0	+1.5
3. Management plan	0.1	0.8	+0.7	0.3	1.0	+0.7	1.0	1.8	+0.8	0.5	2.0	+1.5
4. Allocation of resources	0.1	0.9	+0.8	0.7	2.0	+1.3	0.7	1.3	+0.6	0.0	2.3	+2.3
5. Capacity for management	0.7	1.5	+0.8	0.7	2.3	+1.6	1.0	1.8	+0.8	0.5	2.3	+1.8
6. Commitment from managers	0.3	0.4	+0.1	1.0	2.0	+1.0	1.8	2.5	+0.7	0.8	3.0	+2.2
7. Stakeholder involvement	0.6	2.1	+1.5	1.3	2.7	+1.4	1.0	2.3	+1.3	0.8	2.5	+1.7
8. Co-operation between parties	0.7	1.8	+1.1	0.7	2.7	+2.0	0.7	2.3	+1.6	1.3	2.0	+0.7
9. Address pressures & threats	0.1	1.6	+1.5	1.0	1.7	+0.7	1.5	2.5	+1.0	0.0	2.5	+2.5
10. Control inappropriate activities	0.1	1.3	+1.2	1.0	2.3	+1.3	2.0	2.1	+0.1	0.5	2.3	+1.8
11. Benefits to local people	2.6	2.8	+0.2	2.0	2.7	+0.7	2.7	3.0	+0.3	1.8	3.0	+1.2
12. Achievement of management objectives	0.0	1.3	+1.3	1.5	2.0	+0.5	0.5	1.0	+0.5	0.3	2.0	+1.7
13. Health of the wetland	0.9	1.4	+0.5	0.0	1.7	+1.7	1.0	1.5	+0.5	0.8	2.0	+1.2
14. Monitoring	0.7	1.0	+0.3	0.3	1.7	+1.4	1.0	1.8	+0.8	0.3	1.8	+1.5
15. Evaluation and learning	1.0	1.1	+1.0	0.5	2.3	+1.8	1.0	1.7	+0.7	0.8	2.3	+1.5

All tenure types combined			
Sample time: and sample size:	Bn=19	An=21	C
1. Protection status	0.8	1.1	+0.3
2. Management objectives	0.6	1.6	+1.0
3. Management plan	0.4	1.3	+0.9
4. Allocation of resources	0.3	1.5	+1.2
5. Capacity for management	0.7	1.9	+1.2
6. Commitment from managers	0.9	1.7	+0.8
7. Stakeholder involvement	0.9	2.3	+1.4
8. Co-operation between parties	0.8	2.1	+1.3
9. Address pressures & threats	0.6	2.0	+1.4
10. Control inappropriate activities	0.8	1.9	+1.1
11. Benefits to local people	2.3	2.9	+0.6
12. Achievement of man. objectives	0.5	1.5	+1.0
13. Health of the wetland	0.7	1.6	+0.9
14. Monitoring	0.6	1.5	+0.9
15. Evaluation and learning	0.9	1.7	+0.8

B=Situation before the outside intervention

A=Situation after the outside intervention

Score:

0-0.5	Poor
0.6-1.5	Moderately poor
1.6-2.5	Moderately good
>2.5	Good

C=Change in assessment from before to after intervention, with a + indicating an improvement

Protection status

This component showed the least improvement when the before and after situations were compared, and it was also the lowest scoring component for the after situation. This is understandable given that many of the wetlands are actively used and are in a greatly transformed state for agricultural production, important for sustaining livelihoods. Although at most sites the protection status remained similar, some sites showed an improved score. This improvement was greatest for a site previously under private ownership as farmland, and now a protected site. The respondent felt that the tenure status before the intervention had important implications with regard to the health of the wetland, which could only improve given the site's state of protection following intervention.

"Before intervention of our organisation, it was farmland with every farmer doing his own thing – mostly trying to get the wetland drier, with a few exceptions."

For one of the mixed-tenure sites, the protection status changed from no formal protection to a lease agreement, where the provincial nature conservation authority now leases the land from the town. Although the area is not afforded the level of protection associated with a declared nature reserve, this change in authority has important and far-reaching implications with regard to management of the wetland.

However, as will be elaborated upon later, protection status is no guarantee that the wetland will be managed in accordance with its protected status. The following is recorded of one of the sites which has had legally protected status for several decades:

"Although before it was legally protected on paper, people were living in the reserve and there was little control over livestock grazing and other natural resource uses."

For two sites under communal tenure, the respondents expressed an interest for the sites to be declared as protected, specifically, due to the presence of cranes at one site and based on the spiritual significance of the other.

"There is some thinking by the Wetland Forum to declare it as a Ramsar Site, based on its spiritual significance."

Management objectives

This was one of the lowest scoring components for the before situation. It was noticeably improved in the after situation but the results are still considered to be mainly less than moderately good for both communal and mixed tenure. This is due in part to the fact that at some sites the setting of management objectives for the wetland had not taken place, and at other sites the process was still in progress. Reasons for this included the absence of affected parties from the process of setting management objectives and also difficulty in reaching a common understanding of the nature of the issues facing management.

"We are currently in the process of compiling the Integrated Management Plan as per the Protected Areas Act, which is participated in quite widely by the public."

"The local community is missing from dialogue over the development plan, so no objectives have yet been established."

From the responses it is apparent that only five of the sites had established management objectives that addressed the needs of the majority of stakeholders, and that were derived through participatory processes.

"We have worked with a large group of local farmers, about more than half of all the farmers cultivating in the wetland."

Management plan

Although improvement was reflected in the after intervention scores, overall this was the second lowest scoring component for both the before and after intervention questions. Furthermore, in several cases comments by the respondents indicated that the process of developing and maintaining a management plan was strongly driven by outside agents rather than being owned by local managers.

> *"A management plan is in effect. However, it is uncertain how strongly this process will continue in future without the support of our (Working for Wetlands) project."*

Perceptions among respondents indicated that the 'management plan' was seen as a lengthy document, and for this reason most people would not have the time to read it. Also, even though a management plan was in place, there was no guarantee that the actions would be implemented. At a few sites no formal management plan had been established, and at other sites the plan was in the process of being drafted.

> *"Although there is not a formal management plan for the wetland, the rehabilitation plan is of relevance and also the baseline survey."*

> *"This is a difficult question to score, as the management plan is 'work in progress."*

It is interesting to note that in the mixed-tenure systems with multiple authorities the management plan was the component that scored the lowest of all the components examined, even in the after situation. This is not surprising given that it requires several independent authorities working together on a common plan.

Allocation of resources

Overall, this was the lowest ranking of all the components for the before situation. 'Allocation of resources' improved for the after situation but still generally scored moderately poorly. The perception of questionnaire respondents was largely that the resources allocated for implementing the management plan were financial and of external origin. These perceptions were held mostly for those sites under communal tenure and also for those with protected status.

> *"There is some allocation of resources towards implementing the management plan, but it really depends on the external inputs from the funders."*

At some sites, the 'allocation of resources' was reported to be fairly *ad hoc* and without too much planning.

> *"Difficult to say at this stage as the management plan is not yet finalised. But resources probably have been allocated."*

Capacity for management

This component scored between poor and moderately poor for the before situation and showed an increase in the after situation to a moderately high score. The 'capacity for management' of the wetland sites was perceived by respondents as being linked to their own capacity and availability for intervention as well as the capacity of other interested and affected parties. For sites with protected status, managers were perceived as being the parks officers and for communal areas as being the traditional authorities and those community members appointed to wetland management functions.

> *"The traditional authority was playing a major role in the conservation of the lake and also some training was given to members of the communities."*

For some sites such as that cited above, the assumption appeared to be that if

managers had undergone training then their capacity would have been raised. However, as highlighted by Taylor (1997), this may not necessarily be the case, particularly if the training does not build on the prior understanding of those receiving the training.

Commitment from the managers

This component scored between poor and moderately poor for the before situation and was one of the highest scoring components for the after situation, particularly in the case of protected areas. Given the high score for 'commitment from the managers', it would be expected that the scoring for the 'allocation of resources' would also be high because this would serve as proof of the commitment. However, as already reported upon, 'allocation of resources', even in the after situation was the second lowest scoring element. This suggests that the after situation may have been over-scored. This is supported by some of the respondents' comments.

> *"Commitment has been demonstrated, for example through attendance at meetings, but not much commitment has been demonstrated through actions."*

> *"At first, during the intervention, the commitment was very high, but now it is dying."*

Some respondents also linked 'commitment from managers' to the ongoing support of outside organizations and funding donors.

> *"We are very fortunate to have him there, but I'm sceptical of what will happen once he leaves."*

> *"Commitment is currently good. However in the long term this will depend on outside support, in particular from the funders."*

Breadth of stakeholder involvement

This showed one of the greatest improvements comparing the before and after situations. Across all of the different tenure types it scored just below moderately poor for the before situation to one of the highest scoring elements for after the intervention. This outcome is not surprising as one of the greatest contributions of an external intervention project is to link managers and stakeholders that had not previously been involved.

Co-operation

This followed a similar trend to 'stakeholder involvement', showing the greatest improvement from before to after. It is important to add, however, that although stakeholders are involved it does not necessarily follow that co-operation between the different parties involved, will occur. This was reflected on by questionnaire respondents at a number of the sites.

> *"Although they are present, some organisations are still working fairly independently of the others."*

> *"The farmers are not participating much."*

As discussed in Section 3.1, probing of some of the sites reveals that what is described as 'co-operation' is more a case of coordination.

Addressing pressures and threats

Overall, the score for this component changed from one of the lowest scoring elements in the before situation to one of the highest scoring elements in the after situation, resulting in this being the most improved of the 15 management components examined. But probing this issue finds that much of this improvement does not in fact get to the root causes of the degradation of the wetland. Some

respondents identified a delay in response as the cause and others stated that the problem needed to be seen in a greater context to identify practical solutions.

"There is a slow change in behaviour of catchment users. Pressures within the catchment are not being addressed. Permits were issued without due consideration of the environment because job creation was seen as the primary need."

Controlling inappropriate activities

This element scored between poor and moderately poor for the before situation and showed an increase in the after situation, although for communal use the after situation was still moderately poor. At some of the sites under communal tenure, traditional authority was seen as being adequate to control activities considered inappropriate for the management of the wetland resource.

"The tribal structure can effectively accommodate control mechanisms."

However, at several of the sites under communal tenure, the decline of authority was considered problematic in enforcing control.

"Nothing yet exists to replace the control exercised by the now weakened tribal authority."

At a few sites, questionnaire respondents stated that the problems occurred not only locally, but also within the catchment and for effective management solutions, control needed to be addressed as part of a larger scenario.

"Control is high within the reserve, but difficult to effect within the catchment."

"Within the wetland mechanisms are well in place, but in the wetland's catchment mechanisms are not as good."

As with several of the other components, much of the increased control that resulted from interventions depended on outside support (e.g. the provision of fences and the provision of employment to take pressure off a heavily utilised wetland).

Benefits to local people

For the before situation, this scored noticeably higher than all of the other components* and is increased slightly for the after situation. 'Benefits to local people' at the sites under communal tenure included the continued use of natural resources such as grazing and water for livestock, water for domestic use, land for cultivation of food crops and a source of plant material for weaving and building.

"The wetland is used extensively for water collection, grazing and the cultivation of crops."

For several of the sites, the work generated by rehabilitation interventions extended financial benefits to local people.

"There are major local economic benefits gained through the rehabilitation project."

In a few of the sites, rehabilitation work was also cited as benefiting downstream water users through increased quality and quantity of available water.

Achievement of management objectives

Many of the sites did not have formal management objectives, especially for before the intervention, which made an evaluation of achieving management objectives difficult for questionnaire respondents.

"Difficult to answer as explicit objectives are still being developed."

* These results should, however, be interpreted in the light of the 'over-scoring' identified in Section 3.1.

Where management objectives had been set, the scoring for this element increased substantially from before the intervention to after the intervention. In many cases this improvement was attributed to the technical achievement generated by the rehabilitation structures, and the majority of objectives cited by the respondents (such as that given below) relate to rehabilitation outputs and outcomes rather than relating to the sustainability of land-use practices.

One of the objectives was increasing water availability at the site, and due to the structure, this has certainly been effected.

State of health of the wetland

The scoring for this component showed an increase from before the intervention to after the intervention. Further questioning revealed that much of the improvement could be attributed mainly to the results of structural rehabilitation (supported primarily by Working for Wetlands) and less to changes in the institutional elements of management leading to improved wetland utilisation practices.

"Through the rehabilitation work, the wetland health is much improved."

"After rehabilitation, some of the wetlands are recovering."

Monitoring

Overall, this component scored poor to moderately poor for both the before and after intervention situations. Many respondents said that monitoring should be improved as it was mostly inadequate and conducted at irregular intervals.

"This is one of the areas where I realise I should have been more actively involved. The committee visits some operation areas sometimes."

Even in some of the sites where management objectives and a management plan had been developed, monitoring to assess the implementation of the plan was deficient.

Evaluation and learning

This component scored intermediate in relation to the other elements for both the before and the after intervention situations. The scoring varied considerably between questionnaire respondents. For many sites, respondents claimed that outside organizations were interested in site evaluation and the learning that could be gained from such experience. At other sites, respondents were very positive about the involvement of both managers and local people in the evaluation and the associated learning processes.

"Although the process is not formalised, he has a keen interest in the area and really observes if the rehabilitation intervention works or not."

"The intervention has really taught the landowners alot, they now see the benefit of excluding trees from the wetland area."

3.3 Results in relation to the different tenure types examined

State-owned, protected

The average scores for the different components of management were consistently higher for the protected sites than for the sites under other tenure types (Table 2.2). This is to be expected given that the principal purpose of a protected area is to protect and manage the natural assets of the area. Nevertheless, as highlighted in Section 3.2, there were several components (e.g. setting of management objectives and a management plan, co-operation between parties and monitoring) that did not score highly even for the protected area sites.

Only one of the sites, Memelvei, had been

recently proclaimed as protected status with the before situation being non-protected status. The other sites were protected in both the before and the after situation. One of these sites, Ntsikeni Vlei, in its before-intervention situation, illustrates that although a site is formally protected, this does not necessarily mean that it is formally protected in practice. However, over a period of a few years management effectiveness was substantially improved (Box 2.1). Of all the sites included in the study, this represents the greatest improvement in management effectiveness, when comparing the before and after situation. It is important to add, however, that this improvement involved considerable support from external organisations. This raises the issue of striking a balance between, on the one hand, leaving local managers to struggle alone to address major management challenges with very limited resources and, on the other hand, providing considerable external resources for improving management effectiveness, to the extent that the self-reliance of the local managers is undermined. This will be discussed further in Section 4.

Box 2.1: The improved management-effectiveness of the Ntsikeni wetland

Ntsikeni wetland, one of the largest high-altitude (>1700 m) wetlands in South Africa, is in good condition and is performing valuable biodiversity support and streamflow regulation functions. It is particularly important as a breeding site for the critically endangered wattled crane (*Grus carunculata*). Although the wetland and its catchment, formerly consisting of privately owned commercial farms, was declared a formally protected area in the 1970s, it had become occupied by several households. Many uncontrolled activities, including heavy grazing, extensive and frequent fires, vehicle and cattle tracks, and hunting, were impacting negatively on the wetland and its catchment. Furthermore, no management plan existed for the reserve. This situation largely continued until 1997. Over the six years following this, Eastern Cape Nature Conservation with the support from several partners, including Mondi Wetlands Project, the National Department of Environmental Affairs and Tourism, Working for Wetlands, the WWF, and the University of KwaZulu-Natal, significantly enhanced the management effectiveness of the wetland. This was effected through several actions, including:

- A successful, negotiated re-settlement of the families living within the Ntsikeni Nature Reserve
- The development of a management and monitoring plan for the nature reserve
- The periodic evaluation of the implementation of the management plan
- Successful implementation of a controlled burning programme
- Upgrading of the road and rehabilitation of unplanned tracks.

The management plan, with an overall vision and measurable goals relating to the state of the wetland and with a monitoring and review programme, was developed with multi-stakeholder participation. Participation by the neighbouring communities was obtained through the Ntsikeni Reserve Management Forum. The format used for developing the management plan was based on that provided by the Ramsar Convention on Wetlands (Ramsar Convention Bureau, 2000) and the approach used by Eastern Cape Nature Conservation, which falls within the Department of Economic Affairs Environment and Tourism (DEAET). Funding for the development of the management plan was provided by the WWF-SA through the WWF-Sappi Forests and Wetlands Venture.

In addition, following a comprehensive survey of the wetland by the Mondi Wetlands Project and the DEAET in 1998-1999, erosion sites and artificial drainage channels were identified for rehabilitation. This has been systematically undertaken over the past few years by Working for Wetlands, using local contractors and workers. Working for Wetlands also assisted in providing technical expertise and labour for the controlled burning programme. The long-term sustainability of this intervention relies on the continued maintenance by local management of the introduced burning programme.

Communal

The average scores for the different components of management effectiveness were generally lowest for the communal sites (Table 2.2). As discussed further in Section 3.3, this is not necessarily as a result of the tenure type *per se* but is also a result of several contributing factors associated with communal tenure. The most important of these contributing factors is the weakening of the Tribal Authorities, who were historically responsible for regulating land-use, and the high land-use pressure from households wishing to sustain their livelihoods. For example, Pollard *et al*. (2004) found at one of the communally used sites, Craigieburn, that although the Traditional Authority still see themselves as having a role in land administration and natural resource management, it does not, in fact, exercise any such function.

The situation at four of the sites, namely Mbongolwane, Mohlapetsi, Moro and Craigieburn, are similar to each other in that the wetlands are used for the cultivation of crops by local farmers. This land-use activity has been identified by outside stakeholders as one of the key impacts on the state of health of the wetland. At all of these sites, little success has been achieved in regulating the cultivation activities of farmers, despite the impact that cultivation is having on wetland health. At two of the sites where cultivation was posing a threat to the establishment of rehabilitation structures, attempts were made to address this. Short-term success was achieved to some extent during the project intervention but once the intervention was complete, farmers returned to their previous cultivation practices. A factor contributing to the marginal success in controlling cultivation within the wetland appears to have been a failure to reach a common understanding of what constitutes degradation and how the wetland became degraded. At Mbongolwane, for example, a stakeholder meeting that was attended by several local farmers and outside stakeholders was held at the erosion gully where rehabilitation work was taking place. Although there was agreement amongst most, but not all, attending the meeting that the cultivation adjacent to the gully should not be continued, some farmers were adamant that the cultivation was not contributing to erosion, and thus there was a failure to reach full agreement on this key issue. It would appear that these farmers were amongst those whose direct production was at greatest risk in the event of a change in cultivation practices.

At the Moro site, agreement was reached that cultivation could continue in the area upstream where the advance of the headcut had been halted by an erosion-control structure, on condition that farmers adhered to specific cultivation practices. These conditions included the modification of drains, which should not be cut down into the erodible sandy sub-soil. Initially farmers followed these amended practices, in particular when Working for Wetlands were providing support to the Tribal Authority, but over time these amended practices have fallen away. A contributing factor common to all of the sites, especially the Moro site, is a lack of sustained input from the government department extension workers. This is considered essential given the weakened state of many Tribal Authorities in the face of contemporary pressures.

At the Craigieburn site, a similar situation existed to that at the Moro site, where outside organizations have intervened to encourage lower-impact cultivation practices upstream of the rehabilitation structure. However, here a different approach was used where, since 2002, an NGO has facilitated research and interaction with local farmers, rather than

proceeding rapidly with rehabilitation of the wetland. Although significant awareness appears to have been raised with the farmers, to date few changes in the cultivation practices have been effected, indicating that such change is potentially a lengthy process.

Through a series of workshops, general agreement on the control of cultivation at Mohlapetsi wetland appeared to have been reached. However, these agreements for control of cultivation had little effect in the face of high pressure to use the wetland and the ecological health of the wetland continued to deteriorate (Saronn, 2005; Kotze, 2005). An important factor contributing to the pressure to use the wetland was that the local irrigation scheme, which had failed five years previously, had still not been restored, and it left farmers with little alternative but to use the wetland for cultivation. Other factors confounded the attempt to increase controls over cultivation, and included the perception of some local people that the controls were being used by outsiders to 'take away' local people's land (Silima, 2005, *Pers. comm.*, Mondi Wetlands Project, Pretoria).

Private

Private single-ownership of a wetland generally involves fewer actors than does other forms of tenure, and this makes the development of a management plan easier to facilitate. In the case of two of the private ownership sites, explicit management objectives and a management plan were in place. At one of these sites, resources allocated for implementation of the management plan were mostly adequate, and the site was in a good state of health. At the other site, however, resources allocated for addressing the management needs of the wetland, were far from adequate, in particular the resources for clearing the dense infestations of alien plants within the wetland. This indicates that a management plan in itself, however good the plan may be, is no guarantee of effective management.

At the third site under private single-ownership, although explicit, documented objectives and a management plan were not in place, the landowner had a vision and plan for the wetland. This was serving a useful purpose. However further benefit would have been gained through formalizing the commitment. For example, if the farm were to be passed on to the next generation in the family or were to be sold to another landowner, documented objectives and a management plan would promote better continuity of management.

Wetland sites under private multiple-ownership can be much more complex to manage than those under a single owner (Kotze, 1999). This is highlighted by the example of the Kromme River wetland where individual landowners continue to manage their portions of the wetland independently of each other, and with no overall management plan in place. This resembles the situation documented for Blood River vlei which extends through the boundaries of over 50 individually owned private farms, each operating independently (Kotze, 1999). Although there have been several attempts over the years to encourage farmers to work towards addressing management issues affecting the overall Blood River wetland (e.g. through a farmers' committee for the wetland) these have had little success or have been very short-lived (Kotze, 1999). The various private landowners of Hlatikulu vlei were in the process of developing an over-arching plan for the wetland, which is very encouraging and should be actively supported by the relevant conservation agencies.

Mixed

Several of the wetlands with mixed tenure are located in townlands. Wetlands occurring in townlands are generally subject to multiple impacts, particularly those resulting from modifications to the wetland catchment. At the same time they offer potentially high opportunities for recreation and education. Townland wetlands are also often in the public view and have many stakeholders and individuals and organisations taking an interest in the wetland that are potentially able to contribute to the management of the wetland. One such wetland is the Wakkerstroom Vlei, adjacent to the small town of Wakkerstroom.

This site has a very interesting tenure arrangement, whereby the townlands are leased from the local town council by the provincial nature conservation body that has, in turn, delegated the management authority to a Community-Based Organisation (CBO), the Wakkerstroom Natural Heritage Association (WNHA). This CBO has a specific interest in the conservation of local biodiversity, particularly within the wetland (Box 2.2). This raises the issue of responsibility for management: why has the municipality that has responsibility for managing the wetland largely handed this responsibility over to other parties? The answer is that Wakkerstroom is in a situation typical of a small town, with a very limited budget available for the management of natural areas under its ownership. Although there are individual councillors from the town who make an active contribution towards the management of the wetland, the future challenge will be for the municipality to commit at least part of the resources required for the management of the wetland. This raises an important general question regarding the level to which various actors involved in a particular wetland should take responsibility for the management of the wetland.

Box 2.2: A committed CBO playing a critical role in the management of Wakkerstroom wetland

In 1996, a local CBO, the Wakkerstroom Natural Heritage Association (WNHA), took control of management of the Wakkerstroom vlei, which is owned by the Wakkerstroom town in Mpumalanga province. At that time there was no management plan for the wetland, which was subject to heavy, uncontrolled grazing and uncontrolled burning. Drawing on expert advice when required, this group of committed volunteers has developed a management plan for the reserve and significantly improved the management of the wetland. WNHA has continued to manage the reserve since 1996, except for a few years when the Mpumalanga Parks Board managed the wetland. The WNHA currently fulfils several key management functions that contribute to enhancing management-effectiveness. These functions include:·

- Monitoring and evaluating management and land-use activities affecting the wetland
- Maintaining the fence around the reserve, which is essential for controlling grazing in the reserve
- Administering a permit system for controlling grazing in the wetland and dealing with any illegal cattle in the wetland
- Liaison with the different stakeholders in the management of the wetland
- Raising funds to cover management expenses (e.g. a stipend for a 'policeman' to identify and deal with illegal cattle)

Even so, management has not been without problems. For example, there are misunderstandings on the part of users of the wetland, especially the cattle owners, concerning the role and motive of the WNHA (Nkosi, 2005). There is a particular need to improve communication in order to ensure the long-term sustainable management of the wetland.

4 A framework for summarising changes in the management system over time

At the very broadest level, those components dealing explicitly with management effectiveness (planning, inputs, processes, outputs, and monitoring and evaluation) can be separated from those that are the outcomes of the management system, of which the health status of the wetland could be taken as the key indicator. It is considered useful to track how these two broad components, management effectiveness and the health status of the wetland, change over time. Based on this, three general scenarios can be identified which describe, in a general sense, the situations in the case study wetland sites examined (Figure 2.2).

In Scenario 1, structural rehabilitation measures are implemented in a situation where management effectiveness is already relatively good, and the improved state of health of the wetland resulting from rehabilitation is sustained into the future.

In Scenario 2, although the state of health of the wetland has been improved through the implementation of physical rehabilitation measures, the management system is still weak and unlikely to deal with future pressures and threats that may emerge. If the pressures and threats facing the wetland remain low, then the wetland could remain in a healthy state despite a weak management system. However, given the high level of pressures and threats generally facing wetlands in South Africa, sustaining a healthy state in the long term with an inadequate management system is likely to be the exception more than the rule.

In Scenario 3, both the management system and the state of health of the wetland have been enhanced. The level of enhancement will vary from one site to the next, and in many cases there is still clearly room for improvement in the management system to provide a safeguard for the long-term health of the wetland.

Most of the case study sites reviewed fit in between Scenarios 2 and 3. Only one of the sites fits Scenario 2 completely, where most of the gains in wetland health from rehabilitation have already been lost. However, many of the others could, over time, lose these gains if pressures and threats increase, given that the management system is not fully developed. Recommendations to further develop the management system are provided in Section 5.2.

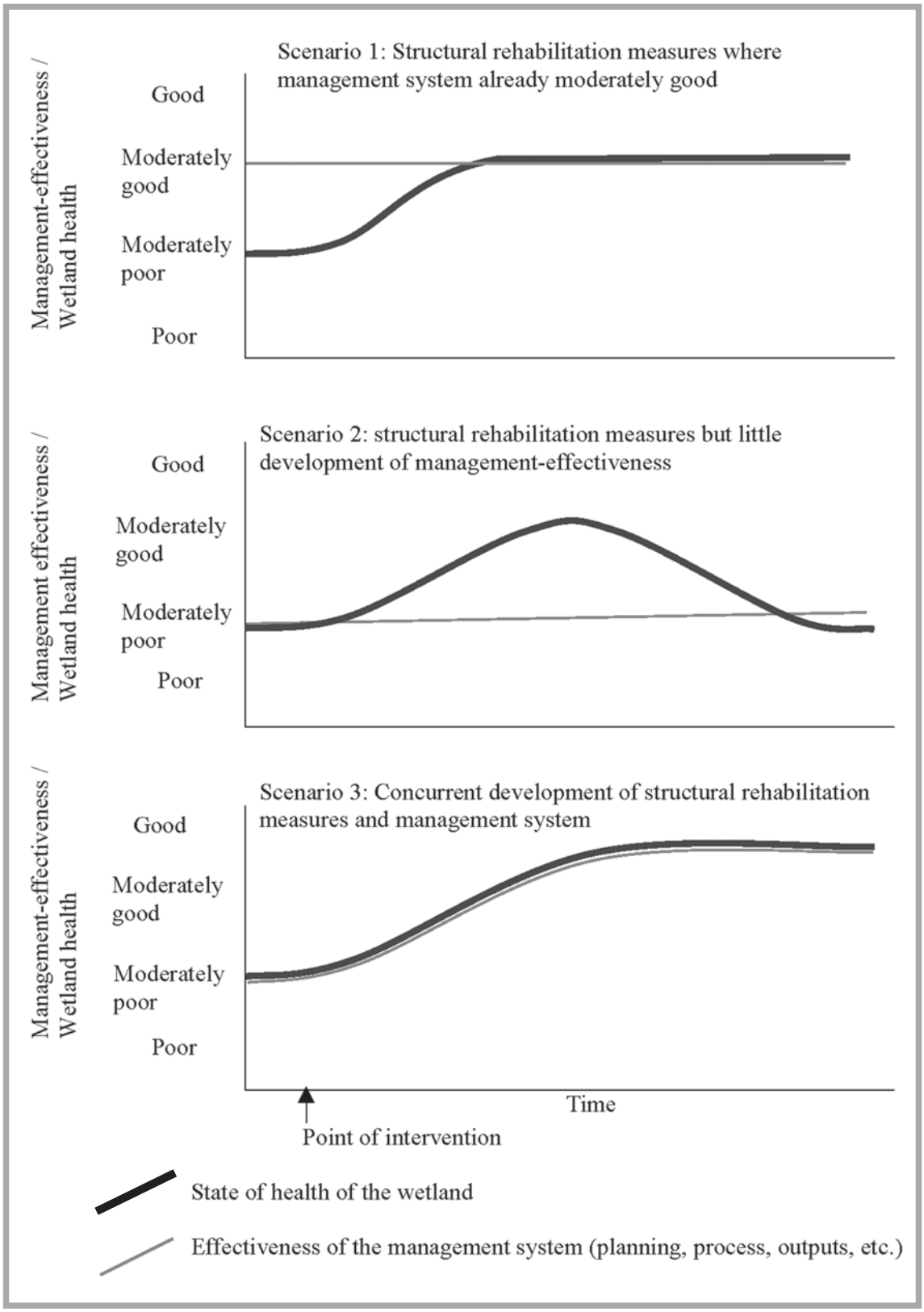

Figure 2.2: Different scenarios describing a change in management-effectiveness over time

5 Conclusions and recommendations

5.1 General conclusions regarding the sites assessed

Management of the use of wetlands, as with most ecosystems, is extremely complex. Not only are the ecosystems being managed both complex and dynamic but so too are the socio-economic systems within which they are managed (Rogers and Bestbier, 1997; Olsson *et al*., 2004). The research presented here is by no means a full exploration of the topic of management effectiveness in wetlands. However, the research framework used and its application to a range of different sites has hopefully contributed new understanding in this challenging area of conservation.

Section 2.4 suggests that there has been a tendency to over-score some of the components of management-effectiveness. Nonetheless, based on the analyses reported on in Section 3.2 of this research, it can be concluded that there have generally been noticeable improvements in the management effectiveness of the sites examined, but these appear to be somewhat less successful in communal Tribal Authority areas than in the other sites. Although at most sites the improvement in management-effectiveness can be attributed to a combination of factors, outside influences through programmes such as the Mondi Wetlands Project, Working for Wetlands, Working for Water and LandCare, South Africa have clearly played an important role. Nevertheless, there is still considerable room for improvement, particularly in respect of measures to make management driven more by local stakeholders. This section ends with specific recommendations designed to address some of the gaps identified in Section 3.

Specific recommendations, designed to enhance management effectiveness, need to be outlined. First however, some key issues, expressed as axes of tension, are highlighted below. It must be emphasised that in each axis of tension it is not a case of one element or the other being chosen but rather a case of striking a balance between the two elements.

Leaving local managers to their own devices versus providing high levels of outside assistance

As highlighted in the discussion on Ntsikeni vlei, there is tension between leaving local managers to struggle on their own and providing them with support to the extent that their self-reliance is undermined. A key factor that will assist in striking this balance probably lies in carefully clarifying roles and responsibilities and how these are anticipated to evolve over time.

Implementing technical solutions *versus* addressing broader management issues

There is a tension, for example, between undertaking the rehabilitation works in an efficient and technically sound manner and integrating the rehabilitation work into the broader management of the wetland and the catchment in which it is located. Both require time and resources. From the perspective of one of the Working for Wetlands implementers, the integrating activities are often seen as 'add-ons' to the core work of building rehabilitation works. Both, however, need to be given requisite attention.

Addressing the immediate needs of local people versus protecting the wetland

There is a tension, particularly great in the context of the subsistence use of wetlands, between the immediate needs of local people and the need to protect the wetland and maintain it in an intact state. In some cases there may be a close correspondence between the needs of local people and those of the wetland (e.g. a community reliant on an intact, untransformed wetland to provide an assured supply of good quality water) but in others these may be very far apart (e.g. a community reliant on a wetland greatly transformed for the production of crops). Such cases present a tremendous challenge for management, as highlighted in Section 3.3.

5.2 Recommendations

Increased protection status of key wetlands

As highlighted in Section 3.2, it will not be feasible to increase the protection status of all wetlands. Therefore it is recommended that a programme be implemented for the prioritisation and selection of those wetlands that require particular protection (e.g. because of their importance for biodiversity conservation or because of their high level of delivery of ecosystem goods and services). This programme would best be coordinated at provincial level, because this is the primary level at which broad-scale conservation planning takes place, and it would need to be integrated into the Biodiversity Conservation Plan for each province involved. The protection of prioritised-wetlands should include options ranging from formally protected nature reserves that are state-owned to stewardship mechanisms (e.g. rebates on land taxes) for increasing the protection of biodiversity assets on private land. Botha (2004; 2005) highlights that there are many opportunities for securing biodiversity values on private land, and in South Africa these have been enhanced through the recently promulgated Property Rates Act (Act 6 of 2004). Amongst other mechanisms, this Act allows for rebates to property owners that invest in sound land management activities, such as regulated alien clearing and the implementation of fire control measures (Botha, 2004).

NRMPs have provided significant indirect support to the regulation process (e.g. through policy development and building the capacity of government officials). However, the direct impacts of NRMPs in supporting the regulation process are fairly limited. It is understandable that there is reluctance on the part of the MWP, for example, to engage in the EIA process in opposing developments considered to be a significant threat to important wetlands because this would jeopardize the MWP's position as an organization that works cooperatively with land users. The EWT engages this process but generally only for wetlands that are important crane habitats, which is also understandable. WfWater engage the legal obligations of landowners in relation to control of alien plants, but this does not extend to other land-use impacts. Although providing some support to the regulatory activities of some Provincial Wetland Forums, WfWetlands currently has little involvement in the regulatory process.

Thus overall there is clearly a gap in terms of organisations playing a 'watchdog' role and actively engaging in the regulatory process. This is an important role given the inadequacies that exist in the implementation of environmental legislation in South Africa.

Guidance and support for the development of management objectives and plans

The most direct contribution that NRMPs can make in enhancing the management of individual wetland sites is to assist in facilitating the setting of management objectives, the formulation of a plan to achieve the objectives and an agreed-upon approach of monitoring and evaluation. This is central to all that follows in the management of a wetland. To this end it is recommended that simple templates be developed that would provide guidance for developing management objectives and plans. In addition to the templates, it would be useful to document case examples that would serve as useful points of reference. At the same time it is important to emphasize that this should not be seen as a quick fix as it is critical that the managers themselves be closely involved, and this can be a time-consuming process.

In the context of a national wetland rehabilitation programme it is recommended that support should not be provided for any rehabilitation where there is not commitment from the management authority in developing management objectives, a basic management plan and monitoring for the site. As indicated, this need not be as onerous as it may appear but it will nonetheless require resources.

Commitment of the managers and allocation of adequate resources

Natural resource management programmes should continue to lobby landowners, particularly large landowners such as timber companies, to allocate adequate resources to meet the management needs of their wetlands. Mondi Wetlands Project has been working with the timber industry for several years in promoting the enhanced management of their wetlands. This work needs to be sustained, and working with other key landowners also needs to be encouraged. From the evidence presented in Part 1, it is recommended that three key groups, the sugar industry, mining and municipalities, should be engaged in such work.

A recurring issue in this investigation is how to encourage greater commitment from landholders for the long-term management of their wetlands, which would promote the long-term sustainability of any rehabilitation that had been implemented. As indicated in Part 2, the greater the direct involvement of the landholders in the rehabilitation, the greater their commitment to long-term maintenance of the rehabilitation and also to management actions. A question raised in Section 5.3 is to what extent could the high level of landholder contribution achieved in the Western Cape with clearing of alien plants in commercial private farms be replicated in other situations? To answer this question key factors that may affect the contribution of landholders to some form of rehabilitation on their land need to be considered. It is accepted that under most circumstances the manner in which projects are implemented has an important effect, and it is necessary to carry out a 'planning with' rather than 'planning for' approach. However, even if the approach is sound, several other factors may affect the extent of the landholder's contribution to the rehabilitation initiative. These include:

- *Resources available to landholders*. If landholders are very resource-poor then any sacrifice that they make towards rehabilitation may potentially impact negatively upon their livelihoods. Conversely, very well-resourced landholders are in a much better position to be able to sacrifice resources.
- *Technical expertise required for the rehabilitation in relation to that possessed by the landholders*. The greater the

expertise required in relation to that possessed by the landholder, the more difficult it will be for the landholder to contribute to the rehabilitation.

- *Security of tenure and control over use*. The lower or more poorly defined the security of tenure and the less control there is over use, then the less is the incentive for landholders to invest in rehabilitation measures.
- *Self-interest of the landholder.* The smaller the landholder's self-interest in the rehabilitation, then the less is the incentive for the landholder to invest in rehabilitation measures.

Some generalisations can be made regarding these factors. Many structural rehabilitation projects require specialist engineering and ecological input that most farmers (subsistence and commercial) lack. In contrast, the expertise required to manage alien plant clearing would be much more readily developed by most commercial farmers, who are generally familiar with the principles of biocide application and are experienced in managing labour teams. Subsistence farmers would generally lack this expertise but it could nonetheless be more readily developed than the expertise required for structural rehabilitation. Commercial farmers, who generally have title to their own land, have greater security of tenure than do subsistence farmers who use communal land. Even so, many subsistence farmers have reasonable security of tenure through customary rights. Although self-interest may be the most important factor determining the contribution that a landholder is willing to make towards wetland rehabilitation, it is difficult to generalize for different rehabilitation situations in relation to this factor, which varies from case to case.

In order to answer the question posed at the beginning of this section, an attempt is made to locate four different rehabilitation situations in relation to three of the influencing factors listed above (see Figure 2.3). Figure 2.3 shows that the situation in the Western Cape where a greater degree of landholder contribution has been achieved is located where it would be expected that landholder-contribution would be most readily achieved. The other three scenarios show that it is progressively more difficult to achieve a greater degree of landholder contribution. Nevertheless, through the strategic choice of particular types of rehabilitation (e.g. a greater focus on rehabilitation options that use more accessible technologies) a high degree of landholder contribution could be encouraged. It is acknowledged that a mix of approaches will be required, with no single right or wrong approach. The framework given in Figure 2.3 will hopefully assist in selecting the most appropriate mix given the particular circumstances.

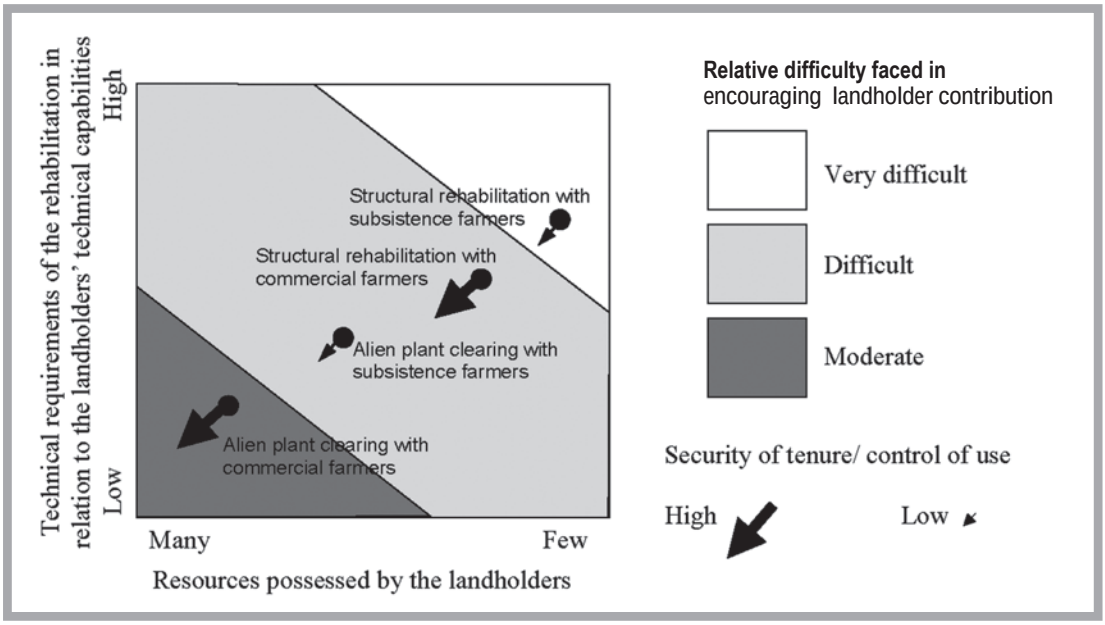

Figure 2.3: Difficulty faced in encouraging a high degree of landholder contribution to wetland rehabilitation, given different types of rehabilitation (structural rehabilitation or alien plant clearing) and different landholders (commercial farmers or subsistence farmers).

Building management capacity

Workplace-based training and mentorship is required to assist in building the management capacity of managers. A wetland-based training programme, the Wetlands Alliance for Training, Education and Research (WATER), is currently being developed to address training needs with regard to wetlands. It is recommended that WATER should explicitly include wetland managers and management issues in its training programme.

Co-operation amongst different role-players

A key aspect of co-operation is to promote more sustained involvement of government department extension workers in the management of individual wetlands, particularly for those sites in communal areas. Community-based groups such as the WNHA also need to be strongly encouraged to take an active role in the management of wetlands, across the various types of tenure. Effective co-operation, particularly involving the relevant government departments, is also seen as a key factor contributing to the effective control of inappropriate activities (e.g. a CBO, whose members often see the local wetland on a daily basis is well placed to timeously report an illegal activity threatening a wetland to the relevant government department before impacts have progressed to an advanced level).

Addressing pressures and threats in a well-informed and integrated manner

Addressing pressures and threats to wetlands is complex and often requires action to address multiple factors at different scales. For example, while working with local leadership, it is often necessary to also work at a more localized scale, e.g. with individual agricultural plot-holders (Box 2.3).

Box 2.3: Working with individual agricultural plot-holders in promoting more sustainable production-practices

Working with individual plot-holders needs to be undertaken on a well-informed and incremental manner. Firstly it is critical to understand why resources are used and how access to land and resources are controlled in a community, which may have a critical effect on the local farming systems and the possibility for promoting particular technologies. For example, when promoting mulching in order to reduce soil erosion and enhance nutrient retention, it is particularly important to know how the rights to crop residues are defined and respected. In much of South Africa's communal areas, for example, the crop residues on many maize fields are regarded as common property for livestock grazing during the dry season. Any individual farmer in such a community is likely to be constrained if he/she wishes to retain the residue as mulch.Secondly, it will often be necessary to work with several individual wetland users, and here Erenstein (2003) recommends that one proceeds in a phased manner that often requires concerted activities at various levels by numerous stakeholders over a prolonged period. This requires the coordination, networking and the facilitation of interaction, information exchange and co-learning. Thus it is advisable to start with only a few local farmers at some pilot localities in what Erenstein (2003) refers to as a pioneering phase. This allows a localised and flexible approach, and the successful internalisation and consolidation of experiences prior to scaling up to other areas.

Promoting the enhanced delivery of benefits to local people

There is little that the programmes examined have done specifically to promote the increased beneficiation to local people through the direct use of the wetland (e.g. through tourism and craft ventures). As elaborated on by Kotze and Silima (2003), the benefits that local people receive from intact wetlands can potentially be substantially increased through well-chosen interventions. Nonetheless, it is important that the circumstances present in each wetland be taken into account and that potential outcomes of initiatives are realistic. For some wetlands the opportunities may be very limited, and furthermore, as revealed in Section 3.3, well-intentioned interventions can have unintended and unfavourable outcomes.

Tourism and crafting are two of the most likely alternative land-use options within wetlands that are potentially less disruptive of wetland integrity than cropping, primarily because they do not require the destruction of the native vegetation, as is required for cultivation. A craft enterprise initiated at Mbongolwane in 1997 continues to contribute significantly in increasing the benefits to local people. Although tourism and crafting both have tremendous potential for promoting sustainable livelihoods in poor areas, they are certainly not "quick-fixes" and it is acknowledged that both of these enterprises are difficult to sustain. Consequently, there is generally a poor track record of successful community tourism projects and craft centres, and many of these are now standing as "white elephants". Nevertheless, there is great potential for both craft production and tourism based upon wetlands. Tourism is one of South Africa's largest and fastest growing industries, and wetlands are well known internationally as sought-after tourist destinations. Crafting has few barriers to entry as it is innovative and is adaptive to changing economic and social conditions (DACST, 1998). Although in absolute terms, most South African crafters earn relatively small amounts from craft sales, the value of crafting as a livelihood strategy compares favourably with the income that most rural women can generate in formal employment in the existing labour market (Marcus, 2000).

Monitoring and evaluation

It is argued that focusing increased attention on the monitoring and evaluation of outcomes at sites will increase the overall effectiveness of the programme. This also needs to be applied at the site level, as is elaborated upon in Section 3.2.

Improved performance in all three of the areas described above will require better integration of the activities of the respective programmes. One of the difficulties is that, as highlighted in Part 1, there is no overarching wetland strategy for South Africa under which different NRMPs can align their respective programmes. However, WfWetlands have recently developed their own strategy with comprehensive input from representatives of its three mother departments and from the other NRMPs. It is suggested that this strategy provides a useful framework for aligning more closely the different programmes and helping the different government departments fulfil their respective mandates in relation to wetlands. The strategy includes several strategic objectives, each with a set of activities against which monitoring and evaluation could be undertaken in order to measure progress towards the objectives.

5.3 The wider application of the management effectiveness framework

It is anticipated that the application of the framework will go beyond the once-off assessment of sites described in this research. The questionnaire has been designed to provide a tool that can be used for evaluating progress in the promotion of the ongoing effective management of wetlands. It provides a framework that could potentially be used in the planning and evaluation of a variety of wetland management and rehabilitation initiatives. Based on its application in this study, the framework appears to be relatively robust across a variety of different management contexts.

The framework has the potential for application by organizations undertaking self-evaluation of their management, as well as organisations playing a role in the influence of management of wetlands held by other organizations. Some of the respondents in this research have, encouragingly, indicated that their intention is to apply it more widely in their own work.

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Appendix 2.1:

Key questions concerning your organisation's intervention at the wetland site:

- Wetland site name
- Landowner or owners
- Farm names or other designation
- Co-ordinates for the site of intervention
- Contact information for the person who identified the problem
- Describe the problem and give the rationale for intervention
- Contact information for the parties who intervened
- Describe what you intended to achieve with your interventions (i.e. your intended outcomes)
- Describe what you did at the site (i.e., what were your interventions?)
- How well did you achieve your intended outcomes? (very well, well, not very well, poorly) Please explain further, highlighting any unintended outcomes.
- Describe the effect that your interventions had on (a) the approach to and goals for management of the wetland and (b) the overall state of health of the wetland (greatly improved, improved; partially improved; not improved). Note: The set of 15 questions in Table 2.1 will assist you in answering this question by guiding you in describing the management of the wetland before and after your intervention.
- How sustainable in the long term do you consider these interventions to be? Please explain.
- What further action(s) are required to enhance the sustainability of the interventions?
- In hindsight were your intended outcomes appropriate and realistic?
- What important lessons did you learn from your interventions and their results?

Appendix 2.2:

Scores for each of the 15 components of management at the 21 wetland sites

	Bodibe		Cragieburn		Draaikraal		Edith Stephens
	before	after	before	after	after	before	after
1. Protection status	0	1	0	0	1	1	1
2. Management objectives	0	0	0	2	1	1	2
3. Management plan	0	0	0	2	0	1	2
4. Allocation of resources	0	0	0	2	0	1	2
5. Capacity for management	1	1	1	2	2	0	2
6. Commitment from the managers	0	3	1	2	2	1	2
7. Breadth of stakeholder involvement	1	2	0	2	3	0	2
8. Co-operation amongst the parties	1	2	0	2	1	0	2
9. Addressing pressures and threats	0	3	0	1	2	2	2
10. Controlling inappropriate activities	0	3	0	1	2	1	2
11. Benefits to local people	3	3	3	3	3	0	2
12. Achievement of management objectives	0	2	*	1	2	1	2
13. State of health of wetland	0	1	1	1	3	0	2
14. Monitoring	0	2	0	2	1	1	1
15. Evaluation and learning	0	2	0	2	1	0	2

	Faber's Hill	Hlatikhulu		Kadishe		Kromme River	
	after	before	after	before	after	before	after
1. Protection status	0	0	0	0	0	1	1
2. Management objectives	1	1	2	2	2	0	1
3. Management plan	2	2	3	0	0	0	0
4. Allocation of resources	1	1	2	0	1	0	0
5. Capacity for management	2	2	2	0	1	0	1
6. Commitment from the managers	1	2	3	0	0	0	1
7. Breadth of stakeholder involvement	2	1	2	1	3	1	2
8. Co-operation amongst the parties	*	2	2	2	2	0	3
9. Addressing pressures and threats	2	2	2	1	1	1	2
10. Controlling inappropriate activities	2	2	2	0	1	1	1
11. Benefits to local people	2	2	3	2	2	3	3
12. Achievement of management objectives	1	*	2	0	0	*	*
13. State of health of wetland	1	1	2	1	1	0	1
14. Monitoring	1	1	1	2	0	0	1
15. Evaluation and learning	1	1	1	3	0	*	*
12. Achievement of man objectives	*	2	*	2	2	2	*
13. State of health of wetland	3	3	1	2	0	1	0
14. Monitoring	1	2	1	2	0	1	0
15. Evaluation and learning	1	2	2	3	1	2	*

	Kruisfontein		Lake Fundudsi		Mbongolwane		Memelvlei	
	before	after	before	after	before	after	before	after
1. Protection status	1	1	0	0	1	1	0	3
2. Management objectives	1	2	0	1	1	2	0	2
3. Management plan	1	2	0	0	1	2	0	2
4. Allocation of resources	*	*	0	1	1	1	0	2
5. Capacity for management	1	2	1	2	1	2	0	2
6. Commitment from the managers	3	3	0	1	1	2	0	3
7. Breadth of stakeholder involvement	1	3	0	2	1	2	0	2
8. Co-operation amongst the parties	*	*	0	3	1	2	0	1
9. Addressing pressures and threats	1	3	0	2	0	2	0	2
10. Controlling inappropriate activities	3	3	0	2	1	1	1	2
11. Benefits to local people	*	*	2	2	3	3	0	3
12. Achievement of management objectives	*	*	*	2	*	2	0	2
13. State of health of wetland	0	0	0	1	2	2	0	1
14. Monitoring	2	3	*	1	0	1	0	1
15. Evaluation and learning	1	2	*	1	1	2	0	1

	Mohlapetsi		Molopo		Moro		Ntsikeni	
	before	after	before	after	before	after	before	after
1. Protection status	0	0	2	2	0	0	3	3
2. Management objectives	0	3	2	2	0	0	0	3
3. Management plan	0	2	2	2	0	0	0	3
4. Allocation of resources	0	2	0	2	0	0	0	2
5. Capacity for management	1	2	1	2	0	0	0	2
6. Commitment from the managers	0	1	0	3	0	0	0	3
7. Breadth of stakeholder involvement	1	3	1	2	0	0	0	3
8. Co-operation amongst the parties	1	2	1	2	0	0	1	2
9. Addressing pressures and threats	0	2	0	3	0	0	0	3
10. Controlling inappropriate activities	0	0	0	3	0	0	0	2
11. Benefits to local people	3	3	3	3	2	3	3	3
12. Achievement of management objectives	*	1	0	2	0	0	1	2
13. State of health of wetland	1	0	0	2	1	2	2	3
14. Monitoring	0	1	0	2	2	0	0	2
15. Evaluation and learning	*	1	0	2	1	0	1	3

	Nyamvubu		Rietvlei		Shoshanguve		Tshanetshe		Wakkerstroom	
	before	after	before	after	before	after	before	after	before	after
1. Protection status	0	1	3	3	2	2	1	1	0	2
2. Management objectives	1	2	0	1	0	1	1	1	0	3
3. Management plan	1	2	0	1	0	1	0	0	0	1
4. Allocation of resources	1	2	*	3	1	2	0	2	0	1
5. Capacity for management	1	2	1	3	1	2	1	3	0	1
6. Commitment from the managers	2	3	3	3	1	2	1	2	1	3
7. Breadth of stakeholder involvement	1	2	2	3	3	3	1	3	0	1
8. Co-operation amongst the parties	0	2	3	3	2	3	0	3	0	1
9. Addressing pressuresa nd threats	2	3	0	2	0	1	1	2	0	2
10. Controlling inappropriate activities	2	2	1	2	1	2	1	3	1	2
11. Benefits to local people	2	2	1	3	3	3	3	3	2	3
12. Achievement of management objectives	*	2	*	2	2	2	*	2	*	2
13. State of health of wetland	3	3	1	2	0	1	0	2	2	3
14. Monitoring	1	2	1	2	0	1	0	3	0	1
15. Evaluation and learning	1	2	2	3	1	2	*	3	0	2

Score:

0	Poor
1	Moderately poor
2	Moderately good
3	Good

* Respondent unable to score this element

See Table 2.1 in the main document for the class descriptions

Part 3
Stakeholder participation in wetland rehabilitation: Six case-study wetlands examined

Nxele IZ and Kotze DC

1 Introduction

1.1 Background

The Working for Wetlands (WfWetlands) Programme, in partnership with government,non-government organisations and research institutions, embarked on a wetland rehabilitation programme which seeks to address wetland degradation in South Africa. Through the WfWetlands Programme, wetland rehabilitation projects have been undertaken at many wetlands around the country. Wetland rehabilitation has been achieved through the Expanded Public Works Programme (EPWP), whose main aim is to draw unemployed people into the country's active economy (Dini, 2004). The WfWetlands Programme employs people from poor households to construct gabions and concrete structures as erosion-intervention mechanisms. In the past, the focus was on achieving short-term objectives, namely constructing intervention structures and employing people from local communities. This was largely an emergency response to rehabilitating wetlands while at the same time, addressing unemployment and poverty.

There has been a shift from the narrow focus on the achievement of short-term project objectives to a greater focus on the sustainability of management of the rehabilitated wetlands. There is a growing recognition that the activities of WfWetlands should extend beyond physical rehabilitation measures (Working for Wetlands, 2005) as mechanical wetland-rehabilitation measures alone will not address the long-term management of wetlands. Another dimension that is viewed as important is that of stakeholder participation and engagement within the rehabilitation and management programmes, with reference to long-term sustainability. In this document the term 'stakeholder' refers to people who have an interest in a particular decision, either as individuals or as representatives of a group. In the context of the rehabilitation and management of wetlands, stakeholders are all those people who will potentially be affected by the management of wetlands, who will be involved in the implementation of management activities; or who are likely to support or oppose the wetland rehabilitation projects and management practices (Darradi *et al*., 2007).

Participation is defined as a process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them (World Bank, 1994). Achieving equitable participation may not be possible as some stakeholders may have a much lower stake than others, and it could be appropriate for them to participate less even though they may have a profound effect, e.g. in policy formulation. Also some stakeholders may choose to participate less than others because they trust that their interests are being catered for. Often some stakeholders merely prefer to be informed of what is happening.

For the purpose of this document, particular focus is placed on the influence that landowners and land-users have in terms of the long-term sustainability of the rehabilitation interventions and the rehabilitated wetlands. It is noted that some land-users might use some resources other than land. As highlighted

in Part 2 of this document, the role of landholders in the long-term sustainability of intervention outcomes is based on the assumption that *the greater the extent to which stakeholders are involved in the management of the wetland, the broader will be the base for support of the management and health of the wetland*. The Ramsar Convention (1999) and some South African policy and legislation, e.g. the Water Law, and State of the Environment Reporting, also support stakeholder involvement based on the principle that all stakeholders should be involved in a project from its earliest stage of consideration through to its implementation. It needs to be recognised, however, that involvement alone may not necessarily determine the sustainability of management outcomes. Co-operation from involved stakeholders is equally important as it is likely to increase the number of inputs from different stakeholder organisations.

Depending on the nature of work that is carried out in many wetland rehabilitation sites external stakeholders engage one another, sometimes on an *ad hoc* basis. Local stakeholders, including but not limited to rural communities, also play a major role in the contribution to the success and the long-term sustainability of development initiatives. Local stakeholder participation is essential in management decision-making for wetlands (Ramsar Convention, 1999). Participation strengthens interpersonal relations, promotes the representation of a diversity of social groups, helps to clarify and stabilize communication between stakeholders and encourages local ownership and commitment and accountability (Foundation for Water Research, 2004).

Local participation further encourages a better understanding of the relevant processes not only by the external service providers, but also by local stakeholders who are the recipients of development, although not all interventions benefit local people (Emmett, 2000; Allen, 2001; Dahl-Østergaard *et al*., 2003; Pimbert, 2004). Local ownership of development interventions can also be enhanced through a well-established understanding of projects by all those involved in such development projects. This report seeks to add to the body of knowledge that pertains to stakeholder participation in long-term sustainability and management of rehabilitated wetlands in South Africa.

1.2 Aim and objectives of the study

The aim of this document is to assess the type of participation in wetland rehabilitation projects, using the World Overview of Conservation Approaches and Technologies (WOCAT) framework. The WOCAT framework was originally developed for effective planning, monitoring and evaluation of soil and water conservation practices (WOCAT, 1998).

The objectives of this report are to:

1. Identify the stakeholders that were involved in the selected wetland-rehabilitation projects and describe their participation using the WOCAT framework.
2. Assess the long-term sustainability of the management outcomes of each wetland based on the type of stakeholder participation.
3. Identify key lessons that can be learned from the way participation was carried out relating to the long-term sustainability of the selected wetlands.
4. Suggest possible ways on improving participation in wetland projects.

1.3 Participation: a theoretical perspective

Many of the projects implemented in the developing world by development institutions such as the World Bank did not achieve all of their development intentions for a number of reasons. These include poor planning, the mismanagement of resources and the failure to adequately involve concerned stakeholders. A major challenge to most development projects is engaging and maintaining the participation of all stakeholders (Dalal-Clayton and Bass, 2002) as there are often preconceptions about the local stakeholders, which include the contention that local stakeholders are not always willing to participate in development initiatives, mostly because of the disadvantages associated with such initiatives. Also many development projects have used top-down strategies of action and as a result have not been sufficiently comprehensive in terms of participation and participatory methods of interaction (Rahnema, 1992).

Development projects involve the interest of many people and/or groups, referred to as stakeholders, who have an interest in a particular decision, either as individuals or representatives of a group. This includes people who influence a decision, or can influence it, as well as those affected by it (Darradi *et al*., 2007). A wide range of participatory approaches have been developed in response to challenges faced in development programmes, and serve as a means of describing the type of participation undertaken by stakeholders (Michael, 1997). In the context of this document, 'type of participation' refers to the involvement of stakeholders undertaken in the rehabilitation project.

For example, if an individual or stakeholder group initiated the rehabilitation project, established contact with external institutions to access the resources and technical advice required for the project and retained control over the use of the resources, then the participation is categorised as 'self-mobilisation' (WOCAT, 1998). However, self-mobilisation is difficult to achieve as many development initiatives, even those proposed or planned by local stakeholders require some external assistance, which may include the continuous support of external institutions (Joseph Rowntree Foundation, 2006).

Participation in natural resource projects such as wetland rehabilitation projects is not any different from participation in other development projects and there is a growing trend towards participatory natural resource management (Critchley and Reij, 1995). According to Ramsar (1999:3), any form of natural resource restoration or management "*should be an open process that involves local community stakeholders as well as stakeholders who will be affected by a project even though they may be geographically distant from the project...*". It should be acknowledged however, that the role that local stakeholders, particularly local communities, can play in natural resource management still needs to be fully established (Pangeti, 1992). Among other measures, this can be achieved through raising awareness and influencing behaviours and practices that led to the degradation of the natural resource in question. These measures "*provide a further mechanism for landowners, resource users and surrounding communities to be drawn into restoration project*". (Ramsar, 2003:3). This is crucial to achieve sustainable impacts (Erftemeijer and Bualuang, 2002).

1.4 Methods

The World Overview of Conservation Approaches and Technologies (WOCAT) framework was identified and applied as a useful framework for analysing the type of participation by the various stakeholders involved in the selected rehabilitation projects. The WOCAT framework describes five types of participation (Table 3.1).

The WOCAT framework alone does not provide the context of this research and the processes that were followed to involve local people at each site. A set of questions was developed to place in perspective the study and the processes followed on each site. A questionnaire was administered as a first step in gathering information relating to stakeholder participation and the long-term sustainability of the rehabilitation outcomes. Stakeholders were requested to describe their specific involvement in each of the stages of the wetland rehabilitation project(initiation,planning,implementation, and monitoring and evaluation). The questionnaire was administered with stakeholder representatives and individuals willing to respond to the questionnaire. Where a respondent referred to other stakeholders, an attempt was made to reach these stakeholders or individuals.

Subsequent to the analysis of the results of the questionnaire, semi-structured interviews were conducted with key informants. Based on the responses from both the questionnaire-survey and the semi-structured interviews, the type of participation undertaken in each phase of the project by the stakeholders was identified with reference to the WOCAT framework. Stakeholders also responded to questions regarding the aftercare of the rehabilitation interventions and the management of the wetland in order to be able to assess the long-term sustainability of the rehabilitation outcomes.

The results of the participation assessment were used to infer the likely long-term sustainability of the outcomes of the rehabilitation project. A key assumption underlying this is that the greater the level of participation by the stakeholders most directly involved with the long-term management of the wetland, the greater will be their commitment to monitoring and sustaining the intervention outcomes in the long-term. The assessment was also based on the management-effectiveness results that were obtained in the study conducted by Kotze and Breen (2009). Kotze and Breen (2009) developed and applied a management-effectiveness questionnaire at twenty-one sites across the country.

Table 3.1: Description of different types of participation presented in the WOCAT Framework (WOCAT, 1998)

Type of participation	Description
Passive participation	People participate by being told what has been decided and what has already happened. It involves unilateral announcements by an administration or project management, which does not listen to people's responses. The information offered belongs only to external professionals.
Participation in information giving	People participate by providing information necessary for planning, implementing, monitoring and evaluating a project. They seldom have the opportunity to influence proceedings and project findings are neither shared nor checked for accuracy.
Participation by consultation	People participate by being consulted or by answering questions. External agents define problems and information-gathering processes and so control analysis. This process does not concede any share in decision-making and professionals are under no obligation to adopt people's views.
Participation for material incentives	People participate by contributing resources, e.g. labour, in return for food, cash or other material incentives.
Participation as a partner (self-mobilisation)	People participate as partners in an initiative, and are fully involved in the decision-making process and in initiating new ideas.

1.5 Description of sites

The sites researched for stakeholder participation vary in terms of land-tenure context, the responsible management authority and historical context. Land tenure refers to the relationship between people as individuals or groups with respect to landownership, land-use, access to land and other natural resources, and institutional organization (FAO, 2002). Management authority refers to the stakeholder who is legally responsible for the management of the wetland. This research report draws on the results of several individual studies including Nkosi (2005), Nxele (2004), Nxele (2006), Haigh (2006) and Kotze and Breen (2009) on the six study sites, Hlatikulu, Ntiskeni, Kruisfontein, Kromme, Wakkerstroom and Mbongolwane.

1.5.1 Hlatikulu Wetland

The Hlatikulu wetland lies in the upper reaches of the Nsonge catchment about 60 kilometres from Mooi River (Begg, 1989; Loon, 1999). The wetland falls within a number of farms and therefore several landowners manage the wetland sections that fall within their respective properties. Besides the farmers, the neighbouring Nsonge community is also considered to be a stakeholder as the decisions taken by the private farmers (e.g. fencing the wetland) ultimately affect the Nsonge people. The landowners, in collaboration with the Maloti-Drakensberg Transfrontier Project (MDTP), are establishing a Strategic Environmental Management Plan (SEMP) for the valley. This plan focuses on the environmental threats to the valley and addresses issues relating to the management of the wetland. The plan provides management actions for the wetland which aim to avoid erosion and channel formation through minimising the presence of livestock, controlling the invasion of alien species (particularly wattle) and implementing a burning regime (Alletson Ecologicals, 2006).

The Hlatikulu wetland is important for a variety of reasons: support of threatened wildlife species (wattled crane), hydrological function and benefits to local people. The wetland is important in terms of water storage, and its supply to humans and animals for drinking (Nxele, 2006). The wetland is also important for socio-economic reasons as the Nsonge community members harvest *ingcobosi (Schoenoplectus brachycerus)* for making sleeping mats (Nxele, 2006).

After a consultation process with one of the landowners (a single landowner initiated rehabilitation on his farm) and Working for Wetlands, a wetland rehabilitation project was undertaken in Hlatikulu to raise the water table as a means of rewetting the wetland, deactivate and stabilise the headcut that was eroding the wetland, restore the habitat for wattled cranes (*Grus carunculatus*) and to create job opportunities for local people. The rehabilitation has taken place on the farms Swarraton and Northington. The main rehabilitation intervention has been the construction of concrete and earth structures to stabilize the headcut erosion and to raise the water table (Nxele, 2006). The rehabilitation structures on Swarraton have worked satisfactorily, as the soil erosion has been reduced, and at Northington the rehabilitation structures were still under construction in 2006 (N Shaw, 2006, *Pers. comm.*, A local Hlatikulu Landowner).

1.5.2 Ntsikeni Wetland

The Ntsikeni wetland is part of the Ntsikeni Nature Reserve which was originally part of the Eastern Cape. After the re-demarcation of provincial boundaries in 2006, Ezemvelo KZN Wildlife (EKZNW) became the management authority of Ntiskeni Nature Reserve. The wetland is government-owned and it is neighboured by commercial farmers and two communities

from local traditional authorities, namely Mabandla and Malenge (Kotze and Breen, 2009; Nxele, 2006).

The wetland is mainly used by the two communities for the grazing of cattle (Gxashi, 2005). A project was undertaken by WfWetlands, in collaboration with other stakeholders, to rehabilitate the degraded sections of the wetland. The rehabilitation was undertaken through the use of gabions and concrete structures (Nxele, 2006; Gxashi, 2005). WfWetlands also assisted the project through the clearing of alien plants (mainly wattle) in the wetland's catchment and through providing support for the reserve's burning programme. The majority of rehabilitation objectives had been readily achieved and the project was likely to be completed in 2007 (Nxele, 2006).

1.5.3 Kruisfontein Wetland

The Kruisfontein wetland is located on the Mooi River in the KwaZulu-Natal Midlands. WfWetlands undertook a rehabilitation project that arose from the impacts to which the wetland had been exposed, in particular the extensive artificial drainage and cultivation of the wetland (Smith, 2006). The wetland is privately owned and other key stakeholders in the rehabilitation and management of the wetland include WfWetlands, the Mondi Wetland Project (MWP) and Eastern Wetland Rehabilitation (EWR).

The owner of the wetland approached the MWP to assess the wetland for its potential as a rehabilitation project. The necessary rehabilitation of the wetland included the restoration of natural flow patterns in the wetland through the building of berms, diversion canals and a concrete weir (Smith, 2006). The overall objective was to raise the water table and stop erosion. Only a small portion of the original wetland was restored through the rehabilitation project, with the remaining upper portion of the wetland remaining fairly dry and reliant on flood water. A possible reason for this could be the fact that the rainfall was below average during the wet season in the year of the rehabilitation project.

1.5.4 Kromme River Wetland

The Kromme River Catchment is situated west of Joubertina on the southern coast of the Eastern Cape of South Africa. The Kromme River is an important water resource for the Nelson Mandela Metropolis (Haigh, 2006). The Kromme River Valley is characterised by "*small areas of seeps and small riparian wetlands on the slopes in the tributaries, few of which are extant*" (Haigh, 2006: 12). Some human-induced influences have contributed to the degradation of the Kromme River (mainly in-stream gullying), and include general development, road and railway lines and land use (including agricultural activities) (Haigh, 2006).

The Kromme River Wetland is owned by several private landowners. The rehabilitation project was initiated in 1997 following a survey conducted by MWP and the clearing of alien plants in the catchment by Working for Water. The rehabilitation plan was developed in response to the very actively eroding head-cuts/gullies that were threatening much of the intact areas remaining in the wetland (Haigh, 2006). A number of stakeholders, including MWP, government agencies (Department of Water Affairs and Forestry, the Cacadu District Municipality and Working for Water), the Nelson Mandela Metropole Municipality (a downstream beneficiary dependent on the water supply from the wetland's catchment) and Rhodes University, participated in the initiation and planning of the project (Haigh, 2006). The wetland was rehabilitated through the installation of erosion control structures, such as gabions and concrete weirs (Haigh, 2006).

1.5.5 Wakkerstroom Wetland

The Wakkerstroom wetland is located to the west of the Wakkerstroom village in Mpumalanga Province, and is approximately 950 ha in size (Tarboton, 1998). The Wakkerstroom wetland is in the communal town lands and is managed by the Wakkerstroom Natural Heritage Association (WNHA) on behalf of the local municipality (Nkosi, 2005), and other stakeholder groups include the local cattle owners and Mpumalanga Parks Board (MPB).

The Wakkerstroom wetland is primarily used for grazing and cattle owners pay a fee for grazing the wetland. Overgrazing by cattle in the past has contributed to erosion in certain sections of the wetland. The wetland also benefits the local community by providing natural resources as some local people collect reeds, but the level of harvesting is very low. The wetland also benefits local people through playing a role in increasing the tourism value of the town, as the natural environment and its bird life are a major attraction.

Soil erosion was identified as a threat to the wetland and the Mpumalanga Parks Board (MPB) initiated a rehabilitation project with the support of WfWetlands, who assisted with the installation of gabions in specific areas to reduce soil erosion.

1.5.6 Mbongolwane Wetland

The Mbongolwane Wetland is a communal wetland approximately 400 ha in extent that is located 40 km to the west of Eshowe, KwaZulu-Natal. The wetland and its entire catchment fall under the authority of the Chief of the KwaNtuli Ward. The KwaNtuli Tribal Authority is considered to be the wetland management authority. However, this authority is weakening in terms of performance of its duties and responsibilities. In addition to the KwaNtuli Tribal Authority, there are other local organizations that are key stakeholders in terms of the management of the wetland. These include the KwaNtuli Farmers Association, the Youth Crops Project (YIELD), the *UkuKhanyaKwesizwe* Water Project, the *Thubaleth'elihle* Craft Group, the *Siyathuthuka* Youth Broiler Project, and the *Phakamani* Sugar-cane Farmers' Association. Other external organizations expressing an interest in the management of the wetland include the KZN Department of Agriculture and Environmental Affairs, the Farmer Support Group, the Institute of Natural Resources, *Ezemvelo* KZN Wildlife, the Mondi Wetland Project, and the University of KwaZulu-Natal.

The wetland is used in a number of ways and includes livestock farming, the cultivation of crops i.e. *amadumbe* or taro, cabbage, spinach and onions) and the harvesting of reeds (*umhlanga: Phragmites australis* and *ikhwane: Cyperus latifolius*) for roof thatching and craft making. The wetland also provides a wide range of habitats for a diversity of bird species, such as crowned cranes, marsh owls, and red-chested flufftails (Kotze *et al*., 2002). The wide range of bird species, the surrounding hills, and sites of historical importance make Mbongolwane an appealing tourist destination (Farmer Support Group, 2004).

In 1999, rehabilitation work to address the degradation of the wetland and to promote the sustainable use of the wetland, was initiated by WfWetlands (Kotze *et al*., 2002). The rehabilitation work included stabilising two of the headcuts that were eroding into the wetland and planting *ikhwane* below the head-cut to assist in binding the soil and reducing the velocity of the water. WfWetlands provided the funds and mobilised community involvement in the rehabilitation of the gully (Farmer Support Group, 2004).

2 Comparison of sites

In this section the process of engaging local people and of identifying the type of participation between the various stakeholder groups is presented. The WOCAT framework is used to identify and present the participation-type of the various stakeholders and to compare the nature and level of participation at each of the selected wetland sites. Fifteen components of management effectiveness are used to compare the selected sites (Table 3.2).

The components used in Part 2 of this document to describe the contribution of management effectiveness to the long-term sustainability of rehabilitated wetlands are presented in Table 3.2. The 'before' and 'after' values show that there was some improvement at the six study sites. Some sites are more secure than others in terms of long-term sustainability.

2.1 Hlatikulu Wetland Rehabilitation Project

Participation of different stakeholders

The roles of the various stakeholders in the Hlatikulu rehabilitation project were determined by their activities at the different stages of the project (Table 3.3). For example, the contract workers participated passively during the initiation phase, and actively in the implementation phase, through the installation of the intervention structures. Other stakeholders that were involved in the initiation and planning stages include Mondi Shanduka (MS), farm managers (FM), contract workers (CW), Working for Wetlands (WfWetlands) and Eastern Wetland Rehabilitation (EWR).

The stakeholders represented in Table 3.3 are also involved in monitoring the

Table 3.2: The fifteen components of management effectiveness as scored for the before and after intervention situations at the six wetlands studied

Components	Hlatikhulu		Kruis-fontein		Kromme		Ntsikeni		Mbongol-wane		Wakker-stroom	
	bef.	after	bef.	after	bef.	after	bef.	after	bef.	after	bef.	after
1. Protection status	0	0	1	1	1	1	3	3	1	1	0	2
2. Management objectives	1	2	1	2	0	1	0	3	1	2	0	3
3. Management plan	2	3	1	2	0	0	0	3	1	2	0	1
4. Allocation of resources	1	2	*	*	0	0	0	2	1	1	0	1
5. Capacity for management	2	2	1	2	0	1	0	2	1	2	0	1
6. Commitment from managers	2	3	3	3	0	1	0	3	1	2	1	3
7. Breadth of stakeholder involvement	1	2	1	3	1	2	0	3	1	2	0	1
8. Co-operation amongst parties	2	2	*	*	0	3	1	2	1	2	0	1
9. Addressing pressures & threats	2	2	1	3	1	2	0	3	0	2	0	2
10. Controlling inappropriate activities	2	2	3	3	1	1	0	2	1	1	1	2
11. Benefits to local people	2	3	*	*	3	3	3	3	3	3	2	3
12. Achievement of management objectives	*	2	*	*	*	*	1	2	*	2	*	2
13. State of health of wetland	1	2	0	0	0	1	2	3	2	2	2	3
14. Monitoring	1	1	2	3	0	1	0	2	0	1	0	1
15. Evaluation and learning	1	1	1	2	*	*	1	3	1	2	0	2

*Respondents unable to score this element
Score:0 =Poor; 1 =Moderately poor; 2 =Moderately good; 3 =Good

completed work, and this contributes to the long-term sustainability of the rehabilitated wetlands. Farm managers check on the built structures to determine if they are working satisfactorily, although this monitoring is often done on an *ad hoc* basis (the structures are checked when and if farmers have the time to do so and no specific programme is followed). There are ongoing discussions between farm managers and other stakeholders concerning the long-term management of the wetland. However, there is no established protocol for monitoring the rehabilitation outcomes to ensure the long-term sustainability of the wetland. The strategic management plan, compiled for the valley (by Alletson Ecologicals, 2006), should "*potentially increase the prioritisation of the wetland as part of the holistic management of the valley*" (Nxele, 2006:75).

Participation through partnerships of farm mangers in project initiation and monitoring is a positive approach to addressing the current and potential threats to the wetland. It demonstrates a level of willingness to work with stakeholder-organisations. Farm managers co-operated at most stages of the project in terms of information giving (Table 3.3), although there was still, with regard to some aspects, a lack of communication links. This can be attributed to there being no forum for farm managers to communicate with each other and with other organisations about rehabilitation on their lands. The relationships among farm managers and also between farm managers and external stakeholders can thus be strengthened through promoting improved communication links and through the active participation in other project stages, such as planning, monitoring and evaluation.

An effort was made to involve local people in the Hlatikulu wetland rehabilitation project. A community meeting was used as the main means of involving people from the Nsonge community (Nxele, 2006). The process of engaging the Nsonge community was difficult as there was no organized structure or authority within the Nsonge community through which communication regarding the wetland rehabilitation project could be channelled (Nxele, 2006). The Nsonge primary school was commonly used for meetings, usually organized through the principal, who is not resident at Nsonge. Messages regarding the rehabilitation project were therefore sent to local people through

Table 3.3: Type of participation by different stakeholder groups within the Hlatikulu Wetland Rehabilitation Project

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation	[CW]	[EWR]	[CW] [EWR]	[EWR]	
Participation in information giving	[MS]	[FM] [MS]	[FM] [EWR] [MS]	[EWR] [MS] [FM] [WfWet]	[MS] [WfWet]
Participation by consultation	[EWR] [FM]				[FM]
Participation for material incentives	[EWR]	[EWR]	[CW] [EWR]	[EWR]	
Participation as a partner	[FM]	[WfWet]	[WfWet]	[FM]	

Note: FM=Farm Managers; CW=Contract Workers; WfWet=Working for Wetlands; EWR=Eastern Wetland Rehabilitation; MS=Mondi Shanduka.

children attending the primary school. The Hlatikulu stakeholder groups felt that the process used to involve local people was satisfactory given the circumstances. However, although there were ongoing meetings and discussions between the farmers and other organisations, there were no representatives from the Nsonge community.

Considering the type of stakeholder participation in the Hlatikulu rehabilitation project, it is apparent that numerous factors influenced the participation in the project. These factors included employment, capacity development and networking skills, and other outside interests of stakeholders. Through employment local people acquired technical skills and knowledge which may have contributed to their enhanced understanding of wetlands and other related issues.

Sustainability of management of the Hlatikulu wetland

The long-term sustainability of the rehabilitation project at Hlatikulu wetland has the potential of being compromised as some rehabilitation work has been conducted, but with no clear approach to monitoring the outcomes of the rehabilitation work. This is further complicated by the fact that limited resources have been allocated for the management of the wetland (N Shaw, 2006, *Pers. comm.*, a local Hlatikulu landowner) and there is a limited budget for the eradication of alien invasive plants (mainly wattle) in the catchment. The lack of a clear approach for monitoring and the limited resources available for the management of the wetland have the potential to result in the ineffectual management of the wetland (see Part 2 of this document). Most of the work, such as the eradication of alien species, is funded and carried out by the farm owners and managers. The Hlatikulu Strategic Management Plan, compiled for the entire valley, has the potential to assist farmers in fulfilling the management objectives that they have set for the wetland, even though the farmers have not set the management objectives for their own portion of the wetland (Nxele, 2006).

The relationship between the landowners and the Nsonge community has the likelihood to strengthen the potential for long-term sustainability of the rehabilitated Hlatikulu wetland. This is because the Hlatikulu farmers and Nsonge people get direct benefits from the wetland, which provides an incentive for them to sustainably manage the wetland. This suggests that it is necessary to involve local organisational structures and authorities that are critical for the potential sustainability of local development initiatives (Ntsebeza, 2004). At Hlatikulu, because these structures do not exist, an alternative could be to involve those individuals who have displayed some degree of interest in the sustainable management of the wetland as it is useful to focus on small nodes of interest and use their successes to build interest at a larger scale (Farmer Support Group, 2004).

Improved communication between all of the involved stakeholders is another key aspect to the long-term sustainability of the Hlatikulu wetland as many of the challenges in development initiatives result from poor communication between government agencies, project implementers and local communities (Bass and Shah, 1994). At Hlatikulu, the broader community could become involved through community forums, schools, local municipal offices, and hospitals and clinics

2.2 Ntsikeni Wetland Rehabilitation Project

Participation of different stakeholders

A number of stakeholder groups were involved in the Ntsikeni wetland rehabilitation project and in the broader management of the wetland, including that of the nature reserve. The reserve management was the authority responsible and accountable for the management of the wetland and willingly participated in the project (Table 3.4). Discussions between the reserve management and the local Traditional Authority strengthened the partnership between these two stakeholder groups and led to an improvement in the level of involvement by the community. At the beginning of the rehabilitation project, only one local community (Mabandla) participated, but over time the other local community (Malenge) also became involved. The participation of other stakeholder groups such as Water Research Commission Project (WRCP), Highlands Wetland Rehabilitation (HWR), and WfWetlands in the monitoring and evaluation of the rehabilitation project indicated their commitment to the long-term sustainability and management of the rehabilitated wetland. Table 3.4 shows that contract workers and Traditional Authorities, who represent their communities, were not involved in the monitoring and evaluation phases of the project. However, the Tribal Authorities and other community-based structures contribute to the management of the reserve through their elected representatives. From Table 3.2 it is apparent that stakeholder involvement has improved (i.e. before versus after situation) over the duration of the rehabilitation project.

Although the different stakeholder groups were involved in the rehabilitation project and the broader, long-term management of the wetland, the stakeholders were influenced and motivated by a range of factors. These factors include employment, capacity development and networking, and other skills (Nxele, 2006). Most of the skills and knowledge that people acquired, e.g. wetland assessment skills and wetland functioning, have potentially increased their understanding of wetland-related issues and the need for the wetland to be sustainably managed for the use of future generations. These skills are necessary as they enhance local capacity (Ayee, 2000). In addition to the skills and employment, some local community members were motivated to participate in the project by the expectation of long-term opportunities such as the Ntsikeni Tourism Project.

A number of mechanisms were used to include local community members in the Ntsikeni wetland rehabilitation project, with community meetings and workshops the main means through which people were involved in the project (Nxele, 2006). Other mechanisms included the involvement of the local authorities and the election of a committee that represented the community. Other stakeholders and those who were employed by the project were generally very happy about the processes that were followed (Nxele, 2006).

Sustainability of management of the Ntsikeni wetland

The Ntsikeni wetland rehabilitation project addressed the majority of challenges facing the wetland before the wetland rehabilitation intervention. The condition of the wetland has improved significantly. "*The wetland has now become a good habitat for birds such as the wattled cranes which are used by the reserve management as an indicator-species of wetland health*" (Local stakeholder, Ntsikeni). Solutions were suggested by stakeholders to further enhance the long-term sustainability of the wetland, including the fencing of the wetland and the monitoring of rehabilitation structures.

Table 3.4: Type of participation by different stakeholder groups within the Ntiskeni Wetland Rehabilitation Project

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation	[HWR]	[HWR]	[CW] [HWR]		
Participation in information giving	[RM]	[RM] [TA]	[RM]		
Participation by consultation		[RM]	[TA]		
Participation for material incentives	[HWR]	[HWR]	[CW] [HWR]	[HWR]	[HWR]
Participation as a partner	[TA] [RM]	[RM] [WfWet] [WRCP]		[WRCP] [WfWet]	[WRCP] [WfWet]

Note: TA=Traditional Authority; RM=Reserve Management; CW=Contract Workers; HWR=Highlands Wetland Rehabilitation; WRCP=Water Research Commission Project; WfWet=Working for Wetlands

Technical structures alone will not be able to enhance the sustainability of the wetland's management, and the collaboration of all affected parties is critically important to achieving this. There is a need to enhance local participation which may require a certain level of understanding by external stakeholders about what affects local people. Generally, local people appreciate the assistance of external stakeholders willing to assist with problems that are not necessarily part of the project in question. Communities and community organizations often need continuous and long-term support from external organisations (Joseph Rowntree Foundation, 2006). As an example, this may be achieved through providing long-term employment for local people but this may not necessarily be feasible within the Working for Wetlands projects. However, tourism initiatives could be used an alternative in achieving long-term benefits to local people.

The relationship between the reserve management and the neighbouring communities has been strengthened mostly through the opportunities provided to the community members through their involvement e.g. employment opportunities. However, should these opportunities be lost, the support from the local community may also be lost (Nxele, 2006).

The tourism project was started in the Ntsikeni area to provide an avenue through which local people could continue to derive direct benefits from the Ntsikeni wetland (Nxele, 2006). "*The project was envisaged by the management forum as the best option to generate profit for the community from the nature reserve*" (Gxashi, 2005:6). The tourism project is seen as being critical in maintaining local interest in the nature Reserve and the wetland. However, there are a number of issues that need to be noted about the eco-tourism project as part of the assessment of its capacity to deliver on the expectations of different members of local communities. In light of its expected benefits, the eco-tourism project is critical to the management and the sustainability of the wetland. However, there are problems with the economic sustainability of the project. Very few people have visited the tourism lodge and this suggests that there is a necessity to market the project (DC Kotze, 2005, *Pers. Comm.*, University of KwaZulu-Natal). An assessment by the Maluti Drakensberg Transfrontier Programme indicated that there is a need for detailed assessment of the tourism project with regard to market viability and also the need to build the capacity of local people with regard to catering and lodge management. Should these issues be addressed, the eco-tourism project will hopefully become a

successful and self-sustaining business (DC Kotze, 2005, *Pers. Comm.*, University of KwaZulu-Natal; Nxele, 2006).

The Ntsikeni Tourism Project thus has the potential to contribute either positively or negatively to the long-term sustainability of the management of the rehabilitated wetland. The tourism project is likely to make a positive contribution if it meets the expectations of local community members as the wetland is likely to be protected. However, the wellbeing of the wetland and its natural assets may quickly be lost if the tourism project cannot deliver the expected benefits. Improved stakeholder co-operation, and other indicators central to the long-term management of the wetland will likely increase the possibility of the project delivering on the expectations of local community members.

2.3 Kruisfontein Wetland Rehabilitation Project

Participation of different stakeholders

The Kruisfontein wetland rehabilitation project was initiated by the owner of the wetland through the involvement of the Mondi Wetlands Project who assessed the possibility of rehabilitating the wetland.

Following the assessment for the potential to rehabilitate the wetland, Eastern Wetland Rehabilitation was approached as the implementing agent together with other stakeholders including WfWetlands, who drafted the rehabilitation plan for the wetland. EWR, WfW and the landowner carried out most of the monitoring work.

This rehabilitation project showed the potential for a high level of 'Participation through Partnerships' (Table 3.1). The other stakeholders that were also involved in the rehabilitation of the wetland, have been identified as being critical to the identification of the challenges and threats that were facing the wetland before it was rehabilitated. In the early phases of the rehabilitation project, the type of participation by some of the stakeholder groups was mostly through information giving or consultation (Table 3.5).

Sustainability of management of the Kruisfontein wetland

The wetland was initially classified as being in a poor condition (Kotze and Breen, 2009) and it is hoped that over time the process of rehabilitation will lead to a considerable improvement in the state of health of the wetland. The landowner had a number of ideas of how the wetland could be sustainably managed. In order to achieve the long-term sustainability of the wetland, *"there needs to be ongoing engagement with the landowner to assist in better implementation of the management mechanisms"* (Working for Wetlands, 2005).

There are a number of factors that have contributed to improving the long-term management and sustainability of the Kruisfontein wetland. These include commitment from the managers, controlling of inappropriate activities in the wetland, monitoring of the rehabilitation work, and addressing the pressures and threats facing the wetland.

The increase in the breadth of stakeholder involvement (Table 3.2) is another factor that will hopefully contribute to the long-term management and sustainability of the wetland. Participation by the landowner was self-initiated and this has led to good communication linkages between the landowner and EWR, the implementing agent. Although, it is unclear what specific roles some of the stakeholders play in supporting the post-rehabilitation management and sustainability of the wetland, it is based on an "*around the table discussion by all the people involved, to discuss what has been achieved...*" (S Ward, 2007, *Pers. comm.*, a landowner).

Table 3.5: Type of participation by different stakeholder groups within the Kruisfontein Wetland Rehabilitation Project

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation					
Participation in information giving		[MWP]	[MWP]	[EWR]	[EWR] [WfWet]
Participation by consultation	[MWP][EWR]	[EWR][WfWet]	[EWR]		
Participation for material incentives					
Participation as a partner	[WO]	[MWP] [WO]	[WO]	[WO] [EWR][WfWet]	[WfWet]

Source: WOCAT (1998) Note: WO=Wetlandowner ; WfWet=Working for Wetlands; MWP=Mondi Wetland Project; EWR=Eastern Wetland Rehabilitation

The Kruisfontein wetland is likely to be sustainably managed in the future, primarily due to the support and commitment provided by the landowner. If long-term sustainability is to be achieved, resources would need to be allocated for the management of the wetland, for example, setting aside a budget for the clearing of alien plants in the wetland's catchment, and for the implementation of the management plan, as there is currently only a budget for the monitoring and maintenance of the rehabilitation structures.

2.4 Kromme Wetland Rehabilitation Project

Participation of stakeholders

Haigh (2006) showed that a wide range of stakeholders, mainly government and non-government organizations, and individual specialists collaborated in the rehabilitation of the Kromme Wetland. As with the other rehabilitation projects, the Kromme rehabilitation project was characterised by different levels of stakeholder participation. Here the landowners were not involved in the initiation phase of the project, and were only actively brought into the project once the structures were complete (Haigh, 2006). This had a negative consequence on landowner 'buy-in' as not all landowners were enthusiastic about the project, particularly where the project was perceived to interfere with farming practices. The general view that some form of contract is needed to bind landowners into monitoring and maintenance of rehabilitation structures may have been easily understood had the landowners been involved in the initiation phase. Table 3.6 shows that a greater number of stakeholders were involved at the start of the project than were involved in the both the implementation and monitoring and evaluation phases. In fact, only two stakeholders [WfWetlands and Gamtoos Irrigation Board] actively participated in the monitoring of the rehabilitation work. It may well be that some stakeholders just want to be informed of progress as it were, noting that most of the stakeholders that were involved in the initial phases were not involved in the last two phases.

Encouraging stakeholder participation is generally a gradual process which requires considerable time to undertake. However, due to the rate at which the wetland was eroding, it was difficult to involve all of the stakeholders. The wetland was eroding so rapidly that if a gradual process was followed there may have been no wetland left to rehabilitate by the time the landowners had reached a point of being self-mobilised.

Table 3.6: Type of Participation by Different Stakeholder Groups within the Kromme River Wetland Rehabilitation Project

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation					
Participation in information giving			[GIB] [WfW] [LO]		
Participation by consultation	[LO]	[LO]			
Participation for material incentives			[GIB] [CW]		
Participation as a partner	[MWP][NMM] [GA] [WfWet]	[WfWet][MWP] [GA] [NMM]	[WfWet]	[WfWet][GIB]	

MWP=Mondi Wetlands Project; GIB=Gamtoos Irrigation Board; WfWet=Working for Wetlands; NMMM=Nelson Mandela Metropole Municipality; GA=Government Agencies (DWAF, Cacadu District Municipality and Working for Water); CW=Contract Workers; LO=Landowners

Sustainability of management of the Kromme wetlands rehabilitation project

The Kromme River rehabilitation project has had a number of positive social and environmental impacts. People employed in the project as contactors and contract workers benefited not only in terms of money, but also in terms of skills and capacity development. The project contributed environmentally through erosion control, securing of intact wetland areas and the stabilizing of river banks (Haigh, 2006). Both the social and environmental contributions made by the project have hopefully provided a platform for the long-term management of the river and its catchment. This is based on the assumption that through these contributions the stakeholders involved may have realized the existing and possible future significance of the project.

Monitoring of the rehabilitation structures is conducted to enhance the management and long-term sustainability of the river. The Gamtoos Irrigation Board and WfWetlands, through their provincial coordinators, perform the monitoring and aftercare of the rehabilitation intervention-structures (Haigh, 2006). The monitoring of intervention structures requires more than two stakeholders, and in the Kromme project, stakeholders such as landowners in particular, the Department of Water Affairs and Forestry, and the local municipality (as the main water resource beneficiary) can play a significant role in the monitoring and management of the river and its catchment. However, some landowners are not enthusiastic about the project and this may eventually contribute towards compromising the long-term management and sustainability of the wetland as landowners will not want to invest resources in the management of the wetland (Haigh, 2006). This can be addressed by ensuring that the rehabilitation is compatible with existing farming practices. The long-term sustainability of the wetland is further compromised by the fact there is no overarching management plan that will encourage the individual landowners to work towards a shared vision for the wetland.

2.5 Wakkerstroom Wetland Rehabilitation Project

Participation of different stakeholders in the project

Generally, some stakeholders and stakeholder groups participated more readily in the project than others. Participation was influenced by respective roles, responsibilities and contributions to the development initiative. The Wakkerstroom Natural Heritage Association was actively involved in the initiation, planning and implementation of the rehabilitation project. They are also involved, as the management authority, in the management of the wetland. The participation by some stakeholder groups was either passive, by consultation, or through information giving in the early phases of the project e.g. the Mpumalanga Parks Board, the Contract Workers and Bird Life South Africa (Table 3.7). Some stakeholders became particularly involved in the implementation phase e.g. Wetland Rehabilitation and Erosion Control and Working for Wetlands.

The early involvement of the WNHA, the management authority, is an indication of self-mobilisation. As in any other wetland rehabilitation project, it is hard to involve contract workers in the initiation and planning phases and it is, in fact, not realistic to expect every stakeholder to be actively involved in every phase of the project. At Wakkerstroom, the contract work was implemented on the basis of six-month contracts as a means of increasing the number of people employed temporarily (Nkosi, 2005).

Sustainability of management of the Wakkerstroom wetland

The Wakkerstroom wetland is supported by a strong, self-funded, community based organisation, the Wakkerstroom Natural Heritage Association (WNHA). This management authority supports the initiatives that seek to improve the status of the wetland and it takes an active role in managing the wetland and controlling the activities that may potentially degrade the wetland. Other stakeholders also support the wetland rehabilitation project, although they were not actively involved throughout the rehabilitation project. However, sixty two percent of the respondents indicated that they would have liked to have been more involved in the different aspects of the rehabilitation. Nkosi (2005:33) This demonstrates that there is potential for improved stakeholder-participation in the future, not only in rehabilitation, but also in the long-term sustainability of use.

Sound management strategies are key to the long-term sustainability of the wetland. At the Wakkerstroom wetland, these strategies included the planned burning of the wetland, the control of grazing through a grazing permit system, reducing pollutant input to the wetland and the establishment of a bilateral management structure with MPB and the Wakkerstroom Municipality. Project monitoring, improving communication levels and sound management strategies are time-consuming activities and processes that require significant resources. This may lead to these activities and processes being side-lined by other issues which are viewed as being more important.

A management plan was developed by the WNHA in 1998, which was an important tool in promoting the sustainable use of the wetland. The plan, which has not been revised, is seldom referred to (see Table 3.2), although the WNHA has recognized that there is a need to revise the plan for improved management of the wetland. Several stakeholders were not aware of the management plan and were also not well-informed of the WNHA and its management roles with regard to the wetland (Nkosi, 2005). This

Table 3.7: Type of participation by different stakeholder groups within the Wakkerstroom Wetland Rehabilitation Project

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation		[CW] [BLSA]	[BLSA]		
Participation in information giving		[MPB]	[WNHA]	[WREC]	
Participation by consultation	[MPB]	[MPB]			
Participation for material incentives			[CW]		
Participation as a partner	[WNHA][MPB] [WfWet]	[WNHA][WfWet] [WREC]	[WfWet] [WREC]	[WNHA] [WfWet]	

Source: WOCAT (1998). Note: MPB=Mpumalanga Parks Board; CW=Contract Workers; WNHA=Wakkerstroom Natural Heritage Association; WfWet=Working for Wetlands; BLSA=Bird Life South Africa; WREC=Wetland Rehabilitation and Erosion Control

finding indicates that there is a need for greater effort to be made by the various stakeholders to engage with one another. Some stakeholders, not involved in the rehabilitation of the wetland, felt that as they were not involved in the rehabilitation of the wetland, there was no need for them to be involved in its management and the WNHA should be responsible for this.

2.6 Mbongolwane Wetland Rehabilitation Project

Participation of different stakeholders in the project

The level of participation varied widely amongst the various stakeholders in the Mbongolwane Wetland Rehabilitation Project (Table 3.8), identified by the LandCare project through discussion with community representatives. Two rehabilitation sites were identified and neighbourhood meetings were held at both sites, although many representatives participated passively in the discussions.

Participation in the rehabilitation project by the Tribal Authority was largely passive and infrequent. The Farmer Support Group and the Mondi Wetlands Project were actively involved during the initiation and planning phases, although there was less participation by these organizations during the monitoring and evaluation phase of the project. The Mbongolwane Wetland Monitoring Committee participated in the monitoring of the rehabilitation structures as the committee was formed once the project was implemented, and was therefore unable to participate in the earlier phases of the project.

Throughout the project, additional stakeholder groups participated, although there was still limited participation by local community members, in particular the local Tribal Authority, who did not want to become involved (Nxele, 2004). This suggests that although there was scope for community consultation within the LandCare project, not all community members felt that they wished to participate.

The participation of local people in development initiatives varies from one situation to the next, although most local people hope to be involved in initiatives that are undertaken within their community. Some people wait to be formally consulted and others participate without formal consultation or invitation. At Mbongolwane, some people participated actively in the project while others were reluctant to participate, in particular those who were cultivating in areas that had been identified as sensitive.

It was therefore possible to separate stakeholders according to those who had an interest in the goods and services and those who did not. This separation potentially can be used to determine the likely participation of stakeholders in the long-term.

Community members participated in the project due to employment opportunities provided by the local contractor. Community members, especially young people "*...ended up raising their expectations thinking that one day the project will create jobs that will give them living salaries*" (External stakeholder, Mbongolwane). This happened, even though it was clarified that the project aim was not to provide long-term employment.

Sustainability of management of the Mbongolwane wetland

The Mbongolwane project was geographically isolated from the rest of the projects that were implemented by LandCare and Working for Wetlands. Due to the prioritisation of wetlands in other catchments as a result of changing priorities within the national WfWetlands programme, the rehabilitation project at Mbongolwane received declining attention and prioritisation from the WfWetlands Programme. However, most of the rehabilitation work within the project had been completed by 2004 with only some original plans still outstanding (Nxele, 2004). The objectives that were achieved include the construction of a concrete canal to reduce the amount of water flowing through the gully and the re-vegetation of the gully. Confusion among some stakeholder groups, such as the Tribal Authority and contract workers, resulted when the project formally ended without the completion of the rehabilitation objectives. The incompletion of the planned interventions to some extent compromised the long-term sustainability of the wetland.

A number of organisations have an interest in the wetland, and these include the KwaNtuli Tribal Authority (KTA), the Mbongolwane Wetland Management Committee, the contract workers, and the provincial Department of Agriculture and Environmental Affairs. Some organisations are comprised of members

Table 3.8: Type of participation by stakeholder groups within the Mbongolwane wetland rehabilitation project

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation	[KTA] [LH]	[KTA] [LH]	[KTA]		
Participation in information giving	[MWP]	[WRCP] [EWR][MWP]	[EWR]		
Participation by consultation	[WRCP][KTA]				
Participation for material incentives			[CW]		
Participation as a partner	[FSG] [MWP]	[FSG] [MWP] [EWR]	[EWR] [FSG]	[MWMC]	[DAEA]

Source: WOCAT (1998). Note: KTA=KwaNtuli Tribal Authority; MWP=Mondi Wetland Project; WRCP=Water Research Commission Project; EWR=Eastern Wetland Rehabilitation; CW=Contract Workers; FSG=Farmer Support Group; MWMC=Mbongolwane Wetland Monitoring Committee; DAEA=Department of Agriculture and Environmental Affairs; LH=Landholders

of the local community, even though there was a general lack of participation by the community. The poor community participation, limited to representatives of the KTA, and other factors have contributed to compromising the long-term sustainability of the wetland. None of the community members were involved in the management of the project and unemployed young people had their expectations raised regarding long-term employment provided by the project, although it was clarified at the beginning that long-term employment would not result from the project. The changes in structure and priorities of the national WfWetlands programme also potentially have a negative impact on the long-term sustainability of the rehabilitation project.

To address the issue of poor community participation, the project implementers organized meetings with all affected landholders. The meetings were mostly centred on the raising of awareness and on trying to convince landholders to avoid planting in sensitive areas as this has negative impacts on wetland health. However, the meetings were poorly attended, in particular by the Tribal Authority, and this has potentially negative impacts on the long-term sustainability of the wetland. However, by the end of the project, the Mbongolwane wetland rehabilitation project had made some significant socio-economic and environmental contributions. The project contributed to advocating ecologically sound production practices, even though participation at these meetings was poor. A variety of local management structures were instituted for management and decision-making regarding the resource management and this was supported by the local authorities who participated if they wanted to (Farmer Support Group, 2004). The *status quo* regarding the sustainability of these management structures and the level of community participation is unknown.

As part of the broader management of the wetland a management plan, which is occasionally used and seldom revised, was developed within the LandCare Project (Kotze and Breen, 2009). Where they exist and are properly implemented, management plans have proved very useful, as they provide a valuable means of assisting in translating the objectives into practical management actions (Kotze and Breen, 2009). The existence of the management plan at Mbongolwane could contribute to the sustainable management of the wetland in the future.

Local enterprises, such as the Thubaleth'elihle Craft Group and the Mbongolwane Tourism initiative, can potentially contribute positively towards the long-term management of the wetland as these enterprises, particularly the craft group, rely directly on outputs from the wetland. The Thubaleth'elihle Craft Group members rely heavily on wetland plants, mainly iKhwane, for their craft products and the relationship between the craft group and the wetland contributes positively towards the sustainable harvesting of wetland plants and the management of the wetland in general. The tourism initiative that was established in 2002 should also hopefully make a positive contribution towards the sustainable management of the wetland, although the relationship is not clearly defined. In light of Mbongolwane being a potential tourist destination, it is acknowledged that tourism at Mbongolwane has to date been very limited and the perceived benefits to local people have so far been insignificant.

2.7 Focusing on management authorities of all six sites

Management authorities are those organisations or bodies that are legally responsible and accountable for the management of the wetland, and those which play important roles in the management and sustainability of the rehabilitated wetlands. Wetland management authorities are the 'faces' of wetland management at the case study sites presented in this document. The participation of management authorities in the rehabilitation project, whether positive or negative, active or passive, potentially has the greatest influence over the long-term sustainability of the rehabilitated wetlands. The type of participation of management authorities varied from one site to another, with some actively involved and others characterized by limited participation, particularly in the initiation and planning phases (Table 3.9).

The majority of the management authorities were actively involved in the initiation and planning phases. This is particularly the case at Hlatikulu, Ntsikeni, Wakkerstroom and Kruisfontein, where the management authorities participated through 'Participation through Partnerships' (see Table 3.1). For some of the sites, the suggestion for rehabilitating the wetland came from the management authorities e.g. Kruisfontein. The self-mobilised nature of participation of most of the management authorities is also witnessed in the implementation and monitoring phases e.g. Kruisfontein.

The participation by management authorities at Mbongolwane and Kromme was limited to passive participation, participation by information giving and participation by consultation. Table 3.9 shows that management authorities exhibited a variety of participation types during the different project phases. For example, the WNHA was actively involved in the initiation and planning phases of the project but was less involved in the implementation phase. The WNHA again became more active during the monitoring phase.

Four of the six management authorities participated in the monitoring phase of the projects, although monitoring was usually *ad hoc* rather than well-structured with clearly defined roles and responsibilities. The participation by management authorities in the evaluation phase of the projects was negligible as only two of the six management authorities were involved in the evaluation phase of the projects. The participation of these two management authorities was through consultation or information giving and no management authorities participated as partners in the evaluation of the projects. The sites characterised by self-mobilisation, i.e. active participation of local management authorities, are more likely to result in long-term sustainability of the site than are those sites characterized by other types of participation.

Where management authorities were not involved in particular, in the initiation phase of the project, the long-term sustainability of the wetlands is not assured e.g. Kromme. Ideally, all local management authorities should be self-mobilised in all phases of the project. However, for some sites the capacity of these authorities and other CBOs to be truly self-mobilized is still a major concern.

Table 3.9: Nature of participation of Management Authorities at the six case study sites

Types of participation	Phases of the project				
	Initiation	Planning	Implementation	Monitoring	Evaluation
Passive participation		[KTA]	[KTA]		
Participation in information giving	[RM] [FM]	[RM] [FM]	[RM] [FM] [LO][WNHA]		[WNHA]
Participation by consultation	[KTA] [LO]	[LO]			[FM]
Participation for material incentives					
Participation as a partner	[WNHA] [LO] [FM][RM]	[WNHA][RM] [LO]	[LO]	[WNHA] [FM] [RM] [LO]	

Source: WOCAT (1998) Note: WNHA=Wakkerstroom Natural Heritage Association; RM=Reserve Manager at Ntsikeni; LO=Landowner of Kruisfontein; FM=Farm Managers at Hlatikulu; KTA=KwaNtuli Tribal Authority (Mbongolwane Wetland).

3 Key lessons learnt from the six case study wetlands

There are a number of general lessons that can be learned from the six selected case study wetlands. These lessons are given in terms of the type of participation in the wetland rehabilitation projects and the long-term sustainability of these wetlands.

3.1 Effecting participation

The manner in which participation by different stakeholder groups involved at the selected case study sites was carried out varied from one site to another. This was largely influenced by the land tenure system in place (private, communal or government) and the number of stakeholders that had a stake in the broader management of these wetlands.

- **Early landowner/land user participation:** involving landowners or land users in an active capacity as early in the initiation phase as possible is critically important for the sustainability of the management of the wetland rehabilitation interventions and the outcomes of these interventions. Early participation potentially increases the support base for the project in the long-term. Where landowners or -users were actively involved in the early phases of the project e.g. Kruisfontein, Hlatikulu and Ntsikeni, the sustainability of the wetland is more assured than where they were less actively involved e.g. Mbongolwane and Kromme.
- **Mechanisms for local participation:** community meetings and meetings with landowners are a useful mechanism though which to engage local stakeholders, particularly in the early phases of a project. At Mbongolwane meetings were used to engage the farmers and to try and persuade them not to cultivate in areas of the wetland that were susceptible to erosion. These meetings were not successful, which highlights that meetings alone are often inadequate to fully engage stakeholder participation and buy-in may not be successful where rehabilitation measures conflict with current land-use activities.
- **Involvement of Tribal Authorities:** the involvement of TAs contributes positively towards the long-term sustainability of development initiatives. It should be noted, however, that the sustainability of projects goes

beyond the involvement of TAs and it also requires that other community-based structures be actively involved. At Ntsikeni, the Tribal Authorities and other community-based structures, such as the Tourism Trust continue to play a major role in the management and the long-term sustainability of the wetland.

- **Self-mobilisation:** through self-mobilisation, the long-term sustainability of wetland rehabilitation initiatives can be enhanced. The sites that are characterized by a high level of local self-mobilization are likely to be more secured in the long-term than those that are characterized by mainly external mobilisation. This is applicable to Kruisfontein, Hlatikulu, Ntsikeni, and to some extent also to Wakkerstroom.
- **Continuous stakeholder engagement:** ongoing participation (whether passive, consultative, incentive-oriented, through giving information or self-mobilisation) contributes towards the long-term management of rehabilitation interventions. It is not realistic to expect that all stakeholders will participate equally in a project. Some stakeholders prefer to be informed about what is happening. A stakeholder should ideally be accountable for ensuring continuous stakeholder engagement. This should be a stakeholder group that benefits directly from the engagement process and that initiates and facilitates the process of landowner or -user engagement.
- **Interests of stakeholders:** the level of interest that stakeholders have in a resource changes over time. Stakeholders who benefit directly from the wetland, e.g. the owner of the Hlatikulu Crane Sanctuary, are potentially more likely to sustainably manage the wetland.

3.2 Long-term sustainability of management of the selected wetlands

There are a number of lessons that can be learned from the six case study wetlands in terms of the long-term sustainability and management of wetlands.

- **Identification of all stakeholders:** it is important to identify all stakeholders that are directly or indirectly affected by the presence or absence (perhaps by changes in wetland structure and functioning) of a wetland before any form of intervention is carried out, as failing to do so will potentially compromise the support that a project would get from some of the stakeholders, e.g. Kromme rehabilitation project.
- **Networking with other organizations:** it is difficult for a national programme to maintain an ear to the ground. This emphasizes the importance of networking with organizations that do so, which can play a valuable role in linking WfWetlands to landholders likely to be committed to sustainable rehabilitation on their land. Kruisfontein serves as an example where the KwaZulu-Natal Crane Foundation put the landowner into contact with the MWP. The MWP conducted an assessment of the wetland and then, in turn, linked the landowner with WfWetlands.
- **Active local participation:** active local participation contributes positively towards the long-term sustainability of the wetland. Local stakeholder participation may vary from time to time and stakeholders should therefore not be expected to participate actively throughout the project. However, an effort should be made by the project managers to encourage them to do so as much as possible throughout the project.

- **Compatibility of rehabilitation with the existing land use:**
  the extent to which rehabilitation is compatible with the existing land-use choice of the landholders will be an important factor in determining their likely interest and participation in the rehabilitation project. In many cases it is not compatible and the desire for change becomes important. The realization of a new set of benefits will most likely dictate a change from existing land-use practices. Where wetlands are being actively used for intensive agriculture, be this in a communal context such as at Mbongolwane, or in a private context such as at the Kromme River, the landowners are more likely to be indifferent or opposed to the rehabilitation. For some of these landowners, the rehabilitation of the wetland is a nuisance i.e. landowners who do not appreciate and acknowledge the value of the wetland and their responsibility towards the wetland. In contrast, where the wetland is seen primarily as a place where nature, especially bird life, is to be actively encouraged, landowners are much more likely to be interested in and actively involved in the rehabilitation. This may be in a variety of contexts, ranging from formally protected land (e.g. Ntsikeni Nature Reserve) to farmland, even in situations where there may be very intensive operations on much of the rest of their farm, e.g. at Kruisfontein. For some of these landholders (e.g. managers of formally conserved areas) the motivation to conserve natural wetland areas derives from the fact that they are mandated to conserve biodiversity. For others the motivation may be a spiritual or aesthetic appreciation of the wetland. There is often also an economic benefit to this conservation, as in the case of nature-based tourism and environmental education at Hlatikulu.

- **Wetland-management focused CBOs**:
  the existence of community-based organizations, e.g. WNHA, Mbongolwane Wetland Committee, Ntsikeni Tourism Trust and Thubaleth'elihle Craft Group, play a potentially major role in sustaining the rehabilitated wetland. Through CBOs, project ownership is improved and thus long-term sustainability of rehabilitation projects is promoted. These CBOs usually make decisions in favour of the sustainable use of the wetland, e.g. implementation of the 'grazing fee' to control grazing in the Wakkerstroom wetland. Capacity varies greatly amongst the different CBOs. For some of these organizations there may be a lack of capacity, in terms of resources and the skills of the members, to effectively implement their responsibilities.

- **Management plan:**
  The existence of a management plan improves the potential for the long-term sustainability of the rehabilitated wetlands, particularly if it is properly implemented and regularly reviewed. It is through a management plan that resource-management objectives are developed. At Hlatikulu, Ntsikeni and Wakkerstroom the management plan, whether already implemented or in preparation, highlights which wetland management objectives need to be fulfilled to achieve the sustainable management of the wetlands in these areas.

- **Alternative development initiatives:**
  alternative initiatives such as the Ntsikeni Tourism Project, Thubaleth'elihle Craft Group and Mbongolwane Tourism have the potential to contribute towards the sustainability of the rehabilitated wetland. Such initiatives are usually adopted as a mechanism to sustain local support in the management and sustainability of the rehabilitated wetlands. However, there is a general

concern that if these initiatives do not deliver as expected, the wetlands and their natural resources may be compromised.

- **Job rotation:**
  job rotation increases the number of people who benefit from employment on the rehabilitation projects. This system hopefully increases, in the long-term, the number of people who display a positive attitude towards the rehabilitation projects and the management of wetlands in general.

- **Governance:**
  Addressing local governance challenges remains part and parcel of the management of wetlands, especially those that are characterised or influenced by a communal setting e.g. Mbongolwane, where governance is generally very complex. Community-based governance structures may, from time to time, require some assistance in order to sustain local support for rehabilitation projects.

4 Recommendations for Working for Wetlands in promoting participation

The Working for Wetlands programme has implemented a number of wetland rehabilitation projects around the country. Until recently the focus has been on installing structures as a mechanism of intervention. Research shows that there is a need also to focus on the long-term sustainability of the rehabilitated wetlands. This section presents recommendations to Working for Wetlands on how to involve landowners or users more directly in the process of rehabilitation (see Table 3.10).

Table 3.10: Recommendations for Working for Wetlands in improving participation in wetland rehabilitation

Recommendations	Rationale
1. Involve landowner or land user as early as possible in the rehabilitation process	The earlier WfWetlands involves landowners or land users, the better will be the understanding of what rehabilitation is about and the more likely the landowners or land users are to feel that they are part of the rehabilitation process. It is assumed that this, in turn, may increase the interest that they take in the aftercare of any rehabilitation structures. In many project sites landowners or -users were consulted once the plans had been completed. Their involvement was limited to 'buying into' WfWetlands plans. The involvement of landowners or -users before the intervention is crucial. This will assist in establishing the type of commitment the wetland is likely to receive throughout rehabilitation and in the future. This supports the view that "engaging stakeholders will assist in surfacing early in a project any unintended social and environmental impacts that may result from the rehabilitation" (Cowden *et al*., 2005:54).
2. Maintain existing and open new linkages, especially with organizations that have a strong presence on the ground.	WfWetlands has strong relationships with some organizations that are well-known at a localised level. Organisations such as Mondi Wetlands Project and The Crane Foundations could be used to spread the message about the WfWetlands programme. These organizations are, in many cases, engaged with landholders in long-term initiatives to improve the sustainable use of the wetland. The long-term sustainability of rehabilitation undertaken in this context is therefore likely to be enhanced. Some stakeholders may not necessarily derive direct benefits from the resource in question, but may make a positive contribution towards an improved management of that resource. It is better to involve stakeholders than to assume that they may not want to be involved. WfWetlands is well-positioned to increase stakeholder involvement.
3. Improve communication and working relationships between WfWetlands and other stakeholders and amongst local stakeholders	Improved communication and co-ordination of actions and stronger working relationships among stakeholders enhances stakeholder involvement (Darradi *et al*., 2007). Not all stakeholders know what WfWetlands do and vice versa. In some cases, even stakeholders that are geographically closely located to one another are communicating poorly.

4. Build the capacity of wetland management focused CBOs	Where they exist, e.g. Ntsikeni and Wakkerstroom, wetland-management committees or forums have proved to be essential for stakeholder participation. The presence of community-based organisations and their level of co-operation to a large extent determines the likelihood of the wetland being well managed. Where they do not exist, WfWetlands should facilitate the process of establishing at least a site-specific management forum. This process can take up vast resources but if WfWetlands are to enhance the long-term sustainability of the rehabilitated wetlands, then forming a forum is worthwhile.
5. Develop a well planned monitoring programme with clearly defined roles and responsibilities	A formalised monitoring programme will ensure that monitoring results are collected and interpreted in a well-planned approach (often documented). If the programme is driven by landowners or land users (and other stakeholders with the necessary capacity also involved), it is likely to get landowners or land users more involved in the process and in turn will enhance the management and sustainability of the wetland, including the aftercare of rehabilitation structures. This may require commitment to all aspects from all stakeholders.
6. Support alternative sustainable economic opportunities and enterprises	The employment opportunities that are provided by WfWetlands are short-term in nature. These opportunities have hopefully raised awareness among the contract workers. Nxele (2006) showed that other projects that accrue economic benefits to local communities, such as the Ntsikeni Tourism Project, are likely to bring about sustainable support from local communities for the project. Jointly with other stakeholders involved, WfWetlands (through their provincial co-ordinators or any other delegated representatives) should identify and support initiatives that have a potential to enhance the long-term sustainability of wetland rehabilitation projects. Resources may need to be spent on assessing the viability of such initiatives.
7. Facilitate the establishment and implementation of a strategic wetland-management plan for each rehabilitated wetland	Some of the rehabilitated wetlands are well catered for by a management plan that has been implemented in a wetland. Where they exist, management plans have proved to have a positive contribution towards long-term sustainability, e.g. Ntsikeni. Drafting a management plan is a critical process that will enhance the involvement by all those that benefit from a resource, either directly or indirectly. Ntsikeni is a typical example, where different shareholders, particularly landowners or land users participated actively to shape the Ntsikeni EMP. This process also improves the sense of ownership by landowners or -users.
8. Cluster the projects that fall within the same catchment	It is easier to establish good working relationships and effective communication with stakeholders where projects are clustered, particularly where landholders are already working towards a common environmental-management vision in a cluster, than where projects are widely scattered, with each project having a whole new set of stakeholders.

5 Conclusion

The involvement of stakeholders affected by a resource, whether directly or indirectly, contributes significantly towards the sound management and long-term sustainability of the resource in question. The Working for Wetlands Programme has been criticized for the inadequate involvement of stakeholders in the rehabilitation of wetlands. Some lessons have been learned from how things were done at the six case study sites, in particular the contribution towards the long-term sustainability of the rehabilitated wetland. For example the long-term sustainability of Ntsikeni, Wakkerstroom and Kruisfontein wetlands is more assured than that of Mbongolwane wetland and the Kromme River wetlands because of the active participation by landowners or -users. Hlatikulu occupies an intermediate position.

At some sites the rehabilitation plans were drawn-up by experts (project implementers) and landowners or -users had little influence in the plans. There are still opportunities to ensure that the intervention measures are driven by local stakeholders (landowners or users and CBOs). In some cases, the lack of early stakeholder involvement has resulted in many wetland rehabilitation projects having no clear future plans after WfWetlands has completed the rehabilitation, e.g. Kromme. At the Kromme site some landowners have lost interest in the WfWetlands programme as

they were not involved in the initiation of the rehabilitation project. This has to a large extent contributed to undermining the long-term sustainability of the rehabilitated wetlands.

There is a growing commitment from WfWetlands to stakeholder engagement. A stakeholder engagement strategy has been drafted which seeks to highlight the existing shortfalls and give the potential improvements that can be made with regard to stakeholder engagement. A set of recommendations, based on the assessment of the six selected case study wetlands, has been developed, which outlines the different approaches that can be used by WfWetlands to improve the engagement of landowners or -users (Table 3.10). These recommendations are not exhaustive or rigid, as the existing relationship between WfWetlands and landowners or -users will indicate what procedure should be followed, based on the specific circumstances at each site.

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Part 4
Collaboration amongst organizations involved in wetland rehabilitation

Kareko J, Breen CM and Kotze DC

1 A framework for understanding collaboration

1.1 Introduction

Managing access to and use of Complex Natural Resources Systems (CNRS) continues to challenge managers. One of the major challenges is coping with emerging issues that are characterised by uncertainty. Complex systems are considered here to be those that consist of a large number of parts that have many interdependent interactions and more specifically interactions that are non-linear (Stacey, 2003). Non-linear interactions mean that the system contains double feedback loops (positive and negative feedbacks), which operate in such a way that every part of the system is potentially linked to every other part. Thus problem situations that arise in these complex systems may not be readily understood using simple cause-and-effect relationships. Rather, to address the emergent situations, managers need to understand the patterns of relationships in complex systems.

As CNRS are open systems, they potentially draw in a number of actors that have diverse interests and understandings. The interaction of these actors can serve to create uncertainty and result in a potentially low level of agreement amongst them. Thus it is postulated that management for the sustainable use of CNRS is only achievable through collaborative behaviour. To create a better understanding of the management of CNRS, wetlands have been used as an example of a complex natural resource system, with wetland rehabilitation as the particular focus. Wetlands are considered good examples of CNRS given that they are:

- located at the transition between terrestrial and aquatic systems and are therefore strongly influenced by both of these systems
- influenced by factors occurring locally (e.g. artificial drainage channels in the wetland) and more broadly (in the catchment upstream of the wetland), and at different time scales (e.g. daily, seasonally or over much longer time periods)
- the source of a broad spectrum of ecosystem services, both locally as well as to distant beneficiaries (e.g. water users downstream).

These attributes of wetlands imply that the management of the use of wetlands falls under the mandated responsibility of a number of government departments and is also of interest to stakeholders with diverse interests. This creates a complex institutional context in which interventions, such as rehabilitation, are implemented and so there may often be low levels of agreement on what should be done and a degree of uncertainty surrounding the intended outcomes of wetland-rehabilitation interventions. Under these conditions of dynamic complexity with multiple interests in wetlands, planning for wetland rehabilitation, whether at a broad or localized level, usually requires different parties to work together in a collaborative way towards seeking sustainable solutions.

Although it is recognized that a collaborative approach is required generally in the

management of CNRS, it is inefficient and inappropriate for 'everybody to be involved in everything'. Collaboration requires a high level of investment of resources (Kinnaman and Bleich, 2004) and where resources are limited, as is often the case, collaboration should be 'directed' to those situations that yield the best or most important return. A rehabilitation project, even one focused only on a single wetland, typically consists of a series of activities (e.g. development of a vision, diagnosis of the problem, establishing the objectives, selection of measures to achieve the objectives, implementation of the measures) to deal with a variety of situations, each with different levels of complexity and urgency. These activities are likely to require different levels of stakeholder involvement and types of organizational behaviour (i.e. how individuals and organizations act when they work together).

The framework presented in this study addresses three main questions.

- What is collaboration and how does one distinguish it from other forms of organizational behaviour such as, for example, coordination?
- Recognising that collaboration often involves a high investment of resources, under what circumstances is it most appropriate?
- How can the effectiveness of collaboration be measured?

Behaviour is conditioned by the beliefs and values that are held by an individual. Clearly, whether individuals are able to collaborate or not will depend on whether they hold shared or at least compatible beliefs and values. So it is necessary to briefly introduce two concepts, *synergy* and *social capital* before dealing in detail with the collaborative management of CNRS.

1.2 Synergy and social capital

Synergy is a term that has been used and applied widely in the management of the use of natural resources. The Oxford Dictionary defines synergy as "the cooperation of two or more things to produce a combined effect greater than the sum of their separate effects", while Lasker *et al*., (2001) refer to synergy as "the proximal outcome of a partnership or the power to combine perspectives, resources and skills of a group of people". Synergy can be represented by the equation as 1 + 1 = 3, signifying that agencies would achieve much more working together than alone.

As synergy occurs when two or more actors work together to realize benefits that individually they could not have achieved on their own, it can be considered to be an outcome of collaboration. Collaboration is defined as a process through which actors view and constructively explore opportunities and differences in search of solutions that go beyond their own limited vision of what is possible on their own (Lasker *et al*. 2001; Taylor-Powell *et al*., 1998). It can thus be postulated that collaboration is effective only when the actors work with common cause and that effective collaboration is a requirement for successful synergy. The criteria used to assess synergy will thus focus on synergy as an outcome of the overall collaborative process.

Social capital is a measure of the bonding that occurs between actors and refers to individual connections and interpersonal interactions, together with the shared set of values that are associated with these contacts and relationships (Edwards *et al*., 2001; Edwards and Foley, 1999). Bourdieu (1986) points out that social capital is developed through the formation of durable relationships and networks of connections. It can thus be deduced that social capital represents

an aggregate of the actual or potential resources which are linked to possession of a durable network. Groups that share beliefs and values are likely to have social capital that better equips them to strive for collaboration, especially in situations of uncertainty and disagreement. Thus, by working together, organisations are able to achieve specialised outcomes that they might not achieve when working individually. It is clear, therefore, that the concepts of social capital and synergy among people are closely related.

1.3 Management of complex natural resource systems

Historically, the management of CNRS has involved the application of management science, which is referred by many authors as a traditional management approach (Stacey, 2003; Johnson, 1999). Management science had its origins in industry where, because of its technological nature, it was possible to control most processes and where there was usually both agreement on the products and a high certainty of delivery. Such situations are amenable to management based on rules and coordination of the activities of the involved parties. Management science manifests from the early work of the engineers Frederick Taylor in 1911 and Henri Fayol in 1916 (Stacey, 2003).

According to Stacey (2003), Taylor's concern in management science was the efficient performance of the physical activities that were required to achieve the organizations' purpose. Taylor's assumption was that management was an objective science that could be defined by laws, rules and principles, such that if a task was clearly defined, and those performing it were properly motivated, then that task would be efficiently performed. Fayol's approach to management, according to Stacey (2003), was not much different from Taylor's. He split an organisation into a number of distinct activities and defined management as the activity of forecasting, planning, organising, co-coordinating and controlling through rules that were to be followed. These two approaches to management, which generally assume that there is one best way that produces the most efficient outcome of the parts of the organization, have been referred by many authors as traditional management approaches (Olson and Eoyang, 2001; Johnson, 1999). In traditional management approaches, organizations are thought to function like machines that achieve given purposes that are deliberately chosen by the managers. However, this type of management lacks the competency to address the uncertainties faced in the management of natural resource systems.

Traditional management approaches have often failed in the management of complex, natural systems. These systems are ecologically complex because many different components interact directly and indirectly, and they are socially complex because multiple user groups have varying beliefs, values, interests and associated behaviours that involve multiple components of the system (Johnson, 1999). The uncertainty of complex systems can at times be high as they are open to a wide range of outside influences that operate over varying time and spatial scales for which data and understanding are often limited. Complex systems are also characterised by different opinions of actors, which can lead to low levels of agreement among actors and thus result in uncertain outcomes. The realization that the management of natural resource systems is faced with uncertainties that may not be appropriately addressed by the traditional management approach has facilitated a shift from the traditional management approach to a systems-based approach,

commonly referred to as an adaptive-management approach. Beginning in the early 1970s, adaptive management has been viewed as a solution to the way in which we manage our interactions with complex natural resource systems. However, its implementation is faced with a number of challenges. In contrast to traditional management, which generally assumes that there is one best way of management, adaptive management is a flexible process of ongoing *learning by doing*, where management actions are treated as potential learning opportunities (Walters, 1997; Rogers and Biggs, 1999) (See Part 2, Section 1.2).

The industrial model of decision making is successful in enhancing efficiency but is poorly suited to a changing environment in which sustainability requires adaptation. An alternative non-linear approach to problem solving and innovation is required (Kinnaman and Bleich, 2004). We consider that both these two management approaches have a role to play in the management for sustainable use of CNRS. One identifies strategic directions whilst the other focuses on the efficient implementation of strategies. Whilst efficient implementation commonly requires that the symptoms of problems are addressed, strategic planning requires that fundamental solutions to problems are sought and is thus a slower process as it involves reflection. Focusing on the symptoms of a problem rather than on the root causes, which Senge (2004) refers to as 'shifting the burden', is a common occurrence in management that deals with complex systems.

1.4 A framework for relating organisational behaviour to problem situations

Complex natural resource systems such as wetlands typically affect actors with different beliefs, values and interests both directly and indirectly. Thus there may at times be a low level of agreement on what needs to be done. The level of agreement is aggravated by the uncertainty of the outcomes of interventions. How actors behave in relation to each other under these conditions is an important determinant of success. When there is high level of agreement and certainty, actors generally tolerate each other's behaviour. However, when there is little agreement and certainty then success will require that actors collaborate or cooperate with each other. These are

Table 4.1: Types of organisational behaviour (Kinnaman and Bleich, 2004)

Type	Description
Tolerance	The least complex, organizationally. A *plan and control* behaviour with sublimated, automatic, routine, responses. *The way things are done*. Only marginal communication is required because individuals assume their roles without conscious effort, interaction or engagement. There may be some information sharing but no shared problem solving. Decision making requires the least amount of resources.
Coordination	Also a *plan and control* behaviour, but more complex than tolerance. Usually two or more entities provide services to a client or programme. Decision-makers consciously engage in observing a problem and creating solutions within existing structures (i.e. shared problem solving is limited). Communication between organisations is usually through established written or verbal procedures.
Cooperation	Cooperation involves different entities working together for mutual benefit, with the realization that their success is aided by the success of others. Entities maintain their distinct identities, yet also achieve shared objectives. Problem solving is often shared. Cooperation is characterized by active, respectful negotiations.
Collaboration	The most complex organisationally. Where the goals and aims of every party are focused on a common vision of what is desired. A greater level of interdependence than cooperation, often involving a combination of human and financial resources and the development of a new, common identity. Decision making requires the most resources.

quite different behaviours.

Kinnaman and Bleich (2004) have conceptually distinguished four general types of organisational behaviour that are located along a continuum of increasing organisational complexity (Table 4.1).

Having acknowledged that different behaviour is required under different circumstances, and in recognizing that there are four general types of behaviour, the question is: how do we promote behaviour that is appropriate under the various situations encountered during the course of a rehabilitation project? Kinnaman and Bleich (2004) argue that to identify the appropriate organizational behaviour for a situation, one would use two key variables that define the situation:

- the amount of certainty that specified actions will produce certain outcomes
- the decision makers' level of agreement regarding the appropriate course of action for the situation.

These two variables can then be represented as the x and y axes of an organisational decision-making model (Figure 4.1), which extends the work of Plsek (2001) and Olson and Eoyang (2001). The model depicts four, tiered organizational behaviours of interest that are appropriate for decision making at various levels of certainty and agreement.

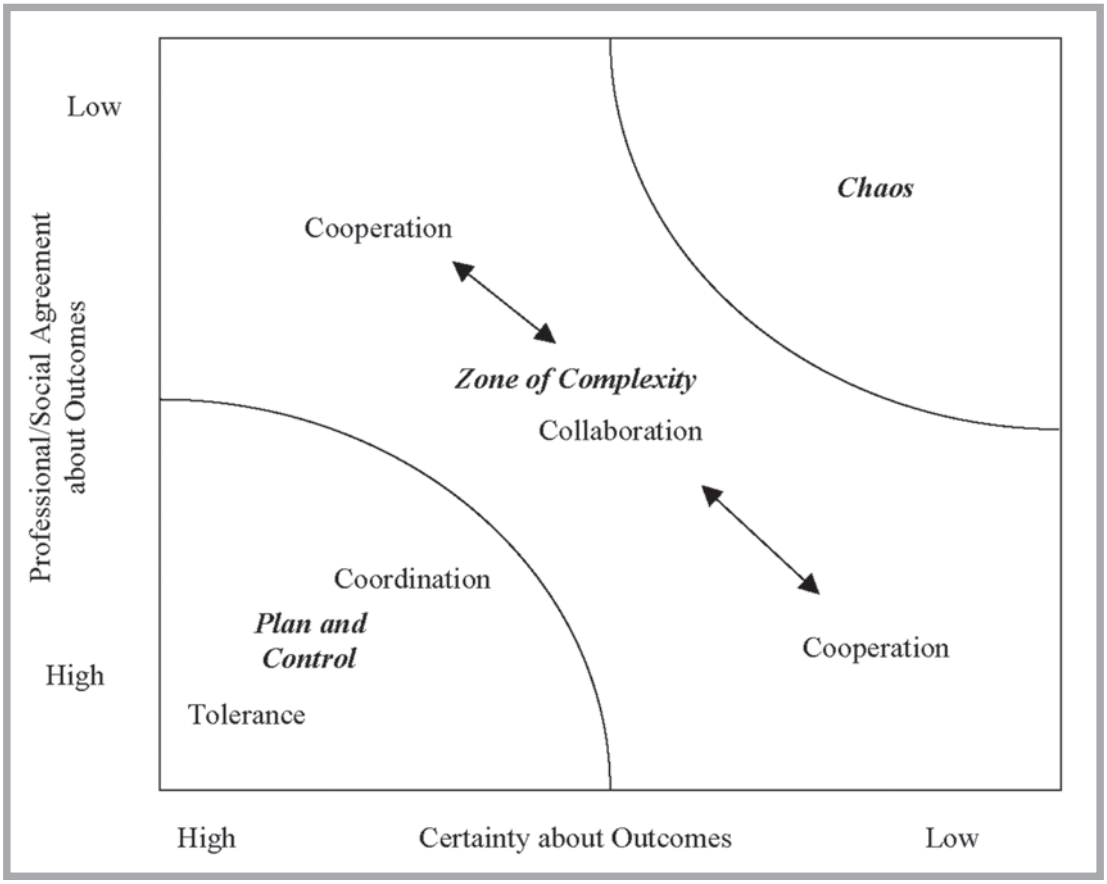

Figure 4.1: The decision-making model, indicating the four organizational behaviours of interest required for the management of complex systems (Kinnaman and Bleich, 2004).

Where both certainty and agreement are high, then according to the decision-making model in Figure 4.1, tolerance is the appropriate type of behaviour, given that a relatively linear, predictable and uncontested response is anticipated. Where certainty and/or agreement are slightly lower, then coordination would be the most appropriate type of behaviour.

The zone of 'chaos' is where both certainty and agreement are at their lowest levels, which, according to Kinnaman and Bleich (2004), is generally not conducive to collaboration. The area between the 'plan and control' and 'chaos' is what is referred to as the zone of complexity (Figure 4.1). In this area, a different paradigm for dealing with emerging problems can be fostered, and it is here that collaboration and cooperation are generally most appropriate.

1.5 A framework for assessing the effectiveness of collaboration

Because wetlands are so highly connected in the landscape, they are also highly connected socially, although this is commonly not well appreciated by actors remotely situated from a wetland. Under these conditions it is reasonable to anticipate low levels of certainty and agreement, and thus wetland rehabilitation initiatives need to strive to achieve collaborative behaviours. However, when people are separated, particularly spatially, they commonly do not share the same understanding of the system. This complicates the promotion of collaborative behaviours and requires that the effectiveness of collaboration be monitored. This section presents an assessment framework for monitoring the effectiveness of collaboration.

Effective collaboration can be said to occur when a state of self-organization exists. This refers to an open, self-renewing process where information is processed, assimilated and disseminated in order to address emerging management situations. It is therefore important to focus on the principles that support self organisation as a means to achieving effective collaboration. Three such principles are identified:

- an explicit shared purpose of the organisations
- reciprocity (give and take)
- open communication amongst the organisations.

Explicit purpose:

An effective collaboration must have a clear purpose for which reason the organization or initiative comes to exist. Agencies that organize are likely to be much more effective when the purpose of the organization is clear and when there is commitment towards meeting this purpose. The organizational purpose reflects the agency's interest and thus the formulation of the purpose and its development should be driven by interest. Agencies are given an opportunity to disclose their interests. Development of the explicit purpose of an organization also serves as a sense-making process for the organisation as it reflects the values and interests of individual actors and also those of the group.

Reciprocity:

The principle of reciprocity can be referred to as that of give and take, where each of the actors values the mutual contribution made to and benefit gained from the group. Reciprocity gives meaning to the organization, such that actors find a need to be part of the organization or initiative, which to some extent contributes to the level of commitment to the organization by actors. It can be postulated that in

an organisation or initiative where actors mutually benefit there is a greater chance of success and sustainability. Reciprocity can be considered to be a key type of organizational relationship that forms between actors striving for a shared goal. These relationships are determined by the level of dependence among the actors of meeting their own interests and those of others.

Open communication:

Effective collaboration will occur in a situation that allows for open communication. In such a situation, actors have access to information that they need to develop understanding, learn together and make informed decisions. Decisions made by actors depend on the information that is available for processing. It should also be recognized that different decisions will require varying levels of information to be available. It should also be recognised that different types of decisions will generate different levels of information, but will vary depending on the situation in question. It is only when information is accessible to all actors that they can rapidly and effectively organize themselves to address emerging management situations.

A key theme of all three principles of effective collaboration in CNRS is that of learning. Two learning 'systems' can be identified: individual and social (i.e. learning from each other) (Sawhney and Prandelli, 2004). In the context of effective collaboration in CNRS, the following are postulated about learning.

- Learning requires a shared focus (wetland/s in this case).
- Open communication is necessary for social learning (i.e. learning from each other).
- The principle of reciprocity, give-and-take, is necessary due to uncertainty and the fact that people hold different views. Actors have to agree to differ whilst still supporting the decision on what to do. This is done on the understanding that all the decisions are based on hypotheses about what might happen and are thus subject to periodic review and reinterpretation following learning.

A matrix has been developed to assess the level to which the three principles are upheld (Table 4.2). The matrix consists of criteria, indicators, standards and methods for assessing each criterion. The criteria act as reference points against which the principles can be evaluated or judged. The indicators give expression to what would be measured or described to judge a particular criterion. The indicators are guided by set standards, which indicate the level of attainment or achievement of the desired situation. Thus the standard indicates the level of achievement of a particular criterion. Overall, therefore, the matrix is used to assess the extent to which each principle of effective collaboration is fulfilled, and the three principles together give an indication of the effectiveness of the collaboration.

The matrix was used as the basis for developing a questionnaire, which was applied to a case study wetland project, reported in Section 3. Before dealing with the specific case study, a brief general overview is provided of collaboration and wetland rehabilitation (Section 2).

Table 4.2: Matrix for assessing effective collaboration amongst actors

Principles	Criteria	Indicators	Standards	Methods
1. Collaboration is based on the principle of explicit shared purpose	• 1.1 The collaborative purpose should be clearly articulated • 1.2 The collaborative purpose should be attained through consensus	• 1.1 Existence of verifiable documented explicit collaborative purpose • 1.2a Actors have a clear understanding in the shared collaborative purpose • 1.2b Actors' acceptance of the stipulated collaborative shared purpose	• 1.1a Explicit statement of shared purpose present or not • 1.1b 100% of actors acknowledge the presence of an explicit shared purpose • 1.2a 100% of actors indicate articulately that they know the purpose of the collaboration • 1.2b > 85% of actors indicate satisfaction in the collaborative purpose	• 1.1a Document review • 1.1b Survey of the actors' acknowledgment of an explicit shared purpose • 1.2a Survey on the actors' clarity of the collaborative purpose • 1.2b Survey on the actors' perception of the collaborative purpose
2. Collaboration is based on the principle of reciprocity (give-and-take)	• 2.1 Actors positively contribute towards the collaborative purpose • 2.2 Actors share tasks, responsibilities and resources	• 2.1 Existence of verifiable contribution made by actors to the collaboration • 2.2 Tasks, responsibilities and resources shared by actors	• 2.1 Verified contributions made by 100% actors • 2.2 100% of task, responsibilities and resources shared by actors	• 2.1 Document review • 2.2 Survey of actors' perception of satisfaction in collaborative resources and task sharing
3. Collaboration is based on the principle of open communication	• 3.1 Shared understanding of information and data interpretation and representation by actors • 3.2 Coordinated dissemination of information and data • 3.3 A clear process for information and data dissemination among actors	• 3.1 Shared understanding of interpretation and representation of information and data by actors • 3.2 Actors receive and disseminate data as it is generated • 3.3 Verifiable stipulated procedures for data dissemination by actors	• 3.1 No conflicts and misinterpretation of information and data by actors • 3.2 No delays and antagonism in task implementation by actors with regard to information and data dissemination • 3.3 > 85% of actors conversant with data and information dissemination procedures	• 3.1 & 2 Document review • 3.1 & 2 Survey of actors' perception on the effectiveness of the overall collaborative communication and accessibility of information and data • 3.3 Survey of actors conversant with data and information dissemination procedures

In this table, actors refers to organisations and agencies anticipating or participating in the collaborative initiative

2 Collaboration and wetland rehabilitation: An overview

Wetlands are expressions of connectivity in the landscape and thus also of social connectivity. Not surprisingly, governance also reflects this, and concern for the health of wetlands is articulated in mandates of government at different levels and among departments, and by those mandates that society gives to non-government agencies. Paradoxically it is because so many agencies have such mandates that wetland health has generally deteriorated in South Africa and in many other parts of the world. This is because accountability decreases as responsibility becomes more widely distributed. The constitution of Working for Wetlands (WfWetlands) is a response to this dilemma as it locates and focuses the national responsibility for wetland health. To be successful, however, it must secure the ongoing support of mandated agencies and the public.

Broadly speaking we can envisage the role of WfWetlands in two operations. Firstly, it must secure collaboration in order to promote the management of the use of wetlands in ways that sustain the optimal supply of goods and services in the long term. Secondly, as many wetlands have deteriorated, it must also secure support for interventions that are required to rehabilitate wetlands. The *WET Management* Series has been prepared to facilitate both of these roles but with a particular focus on rehabilitation. It is clear that WfWetlands cannot achieve its mandate without support from others. What support should they expect and when should they expect it? To answer this question we need to familiarise ourselves with the process that WfWetlands adopts for rehabilitation interventions.

WfWetlands draws largely on 'low-key' cooperative behaviour from stakeholders in an informal network to alert it to situations in which rehabilitation is required. Once WfWetlands makes a decision that intervention is desirable, it then engages with stakeholders to determine what should be done and how this might happen. At the start of this process stakeholders may be uncertain as to whether intervention is necessary, what sort of intervention may be required and what the outcomes of such an intervention may be. Under conditions of such uncertainty, success depends on the commitment of stakeholders to cooperative behaviours that can lead the group to a shared vision, goal and approach. This not only forms the foundation for designing and implementing the intervention but also for aftercare. Three principles that are important to cooperative behaviour are willingness to share information so that actors can learn together, place the common good above personal good, and commit to an explicit statement of shared purpose.

Once there is a shared purpose, agreement on the nature of the intervention and the expected outcomes can be reached and the process shifts to design and implementation of the intervention. This commonly involves new actors, whose interest is more focused on the intervention and less so on the wetland. Because the intervention is a 'planned and controlled' process about which there is generally a high level of agreement and which is expected to bring about defined changes in the condition of the wetland, it elicits quite different behaviours from participants. The intervention is disaggregated into sequential steps each dependent upon the preceding one. Success depends on coordination behaviours. It is also operationally 'intensive'. During implementation of the agreed intervention, it is quite common for stakeholders who do not have roles in implementation to withdraw and exhibit 'toleration' behaviour, allowing the work to proceed without their involvement.

When the intervention has been completed and signed off by the responsible actors, the emphasis shifts to achieving the anticipated outcomes. Because the outcomes are an integral part of the shared vision for the wetland, this requires monitoring and evaluation by the stakeholders that drew up the vision and goals and by others that may have been drawn into the process. Monitoring and evaluation are characterized by uncertainty because conditions are not easily predicted with confidence and because they commonly operate at much lower levels of intensity than they did during the implementation of an intervention. This uncertainty and low level of activity can lead to frustration and declining commitment. To sustain cooperative behaviour it is necessary to report in ways that promote continuous learning and that show how the outcomes relate to the particular mandates of stakeholders. How well such behaviour is fostered will determine the commitment of parties to the sustainable use of wetland resources and reciprocity that will make available the resources required to achieve this.

3 Application of the framework to the Rietvlei Wetland Rehabilitation Project

In this section, the framework described in Section 1 is applied to a case study of the Rietvlei wetland rehabilitation project in Gauteng province. The case study is introduced and the major findings are reported.

3.1 A description of the site and its organisational context

The Rietvlei wetland occurs in a nature reserve under the jurisdiction of the Tshwane Metropolitan Council, which is the sole landowner of the reserve. The wetland rehabilitation was initiated in the year 2000 and it has focused mainly on the peatland portion of the wetland. The degradation of Rietvlei wetland was associated with a change in the natural water regime made by the previous landowners, who diverted water, mainly using canals and drainage furrows, in order to convert the wetland into arable land. The channels have since resulted in vertical erosion within the wetland.

The primary objective of the rehabilitation was to curb wetland erosion and facilitate spread of water over the wetland system by raising the water level in the main channel. This was achieved by installing weirs and raising the level of existing weirs. A secondary aim was to conserve the peat within the wetland and to improve the water quality by controlling the sewage discharge that runs into the wetland system.

Much of the rehabilitation undertaken at Rietvlei was undertaken within the WfWetlands national initiative on wetland rehabilitation. Within this initiative, WfWetlands contracted independent companies, Land Resource International (LRI), and Northern Wetland Rehabilitation (NWR) to conduct wetland rehabilitation planning and implementation respectively. The function of these contracted companies was principally defined by the contracting organisation (WfWetlands) which in this case is considered to be the change agent in wetland management, with a role to facilitate wetland rehabilitation where change is required.

Rietvlei Wetland was purposefully chosen as a case study as it offered a

wide array of issues and opportunities that would require organisations and individuals to work together. Its location near Pretoria for which it provides water storage and supply, as well as being a game reserve under management of the Tshwane Metropolitan Council (TMC), attracts the interest of many stakeholders. These stakeholders include the three departments, Department of Environmental Affairs and Tourism (DEAT), Department of Water Affairs and Forestry (DWAF) and Department of Agriculture (DoA), which are mandated to manage the use of the wetland resources (see Part 2).

3.2 Methods

The matrix given in Table 4.2 was used to develop the questionnaire which was used to assess the effectiveness of collaboration in the wetland rehabilitation initiative. The questionnaire was designed to allow respondents to share their perceptions about how the various organisations worked together in the wetland rehabilitation initiative. The questionnaire was semi-structured and administered on a one to one basis. For each question where the respondent was asked to rate a particular aspect (e.g. the timeliness with which information is shared) he/she was given an opportunity to give any other comments relating to the question. This assisted with obtaining further insight into the relationships between the various organizations. Additional information was collected from documented material (e.g. the rehabilitation plan for the initiative).

The selection of the interviewees was conducted using a 'snowballing' method, whereby persons involved directly in the implementation were interviewed and requested to list other organizations that were involved in the rehabilitation initiative. The organizations listed were then contacted by telephone for a brief inquiry regarding their involvement in the rehabilitation initiative, and to secure an appointment for further interviews. Out of the twelve organizations listed, six interviews were conducted, which included all of the organizations that were most closely involved in the rehabilitation initiatives. The interviews lasted on average an hour and a half each. The interviews dealt with issues related to relationships, the formation of the initiative, processes and practices, conditions and nature of relationships, and communication within the initiative.

3.3 Organisations involvement in the wetland rehabilitation process

For the 12 organizations that were found to have been involved in the rehabilitation initiative, the level of involvement varied considerably, with only six of the organizations having an intermediate or high level of involvement (Table 4.3). A general response from organizations with a low involvement was:

> *"WfWetlands is involved in wetland rehabilitation. We just helped with a particular aspect[s]of the rehabilitation (e.g. licensing, funding, consultation, and providing of equipment)."*

The wetland rehabilitation initiative was identified as consisting of six phases, the initiation, planning, implementation, monitoring, evaluation, and post-planning phases. Organisations were requested to indicate the phases in which they were involved and their level of involvement in each of the phases. Only WfWetlands, TMC, and NWR were involved in all six of the rehabilitation phases. Other organisations were called upon to participate in phases where their expertise or contribution was deemed necessary, mainly by the lead organisation, which remained WfWetlands throughout the project. Organisations

Table 4.3: Organizations involved in the rehabilitation initiative at Rietvlei, and the overall level of involvement in the initiative

Organisations	Involvement
Working for Wetlands, Northern Wetland Rehabilitation , Tshwane Metropolitan Council	High
Working for Water, Department of Agriculture, Land Resources International	Intermediate
Department of Water Affairs and Forestry, Agricultural Research Council, Mondi Wetlands Project, South African National Parks Board, Friends of Rietvlei, University of Pretoria	Low

in the intermediate category, e.g. DoA, were involved mainly in the initiation and planning phases, through consultation with WfWetlands, and were then called upon again for technical advice and expertise in the implementation phase.

As the project progressed to the implementation phase, the number of organisations that had a high level of involvement increased (Table 4.4), with one respondent explaining how this took place:

> *"Many organisations were not involved in the initial stages ...when things start, people take time to buy in (to) the idea, and as time goes on people come on board. The involvement of other organizations is now improving."*

Following the implementation phase, the number of involved organisations declined steadily and only one organisation, namely WfWetlands, retained a high level of involvement. This decline is to be expected given the process that is described in Section 2. As discussed further in Section 3.5, the narrow involvement in the post-planning phase was probably inappropriate for the uncertainty that characterises this phase.

3.4 An evaluation of the effectiveness of collaboration in the rehabilitation of the Rietvlei wetland

The organisations were assessed on how well they worked together during the wetland rehabilitation. The assessment was based on the respondents' perception towards their working relationship with other organisations. The assessment, conducted using a questionnaire, was focused on the three principles for effective collaboration, as elaborated upon in Section 1.5, and presented here briefly:

- an explicit, shared purpose among the involved parties
- reciprocity (mutual benefit) among the involved parties
- effective open communication among the involved parties.

For each of the three principles, the respondents were asked to score several relevant variables, generally between 0 and 4, i.e. excellent (4), very good

Table 4.4: Number of organizations involved in the various phases of the rehabilitation initiative at Rietvlei

Phases in the project	Number of organisations involved in the phase	Number of organizations having a high level of involvement in the phase
Initiation	5	2
Planning	5	3
Implementation	6	4
Monitoring	5	1
Evaluation	4	1
Post-planning	3	1

(3), good (2), fair (1) and poor (0), and these scores were aggregated to give a percentage score for each of the principles. These aggregated scores ranged from a minimum of 0% where all variables scored the minimum score to a maximum of 100% where all variables scored the maximum score. This was carried out for each of the six respondents and the mean of the aggregated scores for all of the six respondents was calculated, and is presented in Figure 4.2.

3.4.1 A summary of the effectiveness of collaboration according to the three principles of collaboration

There was a general perception amongst the six organisations interviewed that there was a clear, shared purpose for the rehabilitation initiative and that a generally good spirit of give and take existed in the initiative. However, important problems were identified around communication within the initiative. This is reflected in the summarized scores for the three principles (Figure 4.2) which indicates that 'shared purpose' and 'reciprocity' scored high (both scored over 70 out of a maximum score of 100) but 'open communication' scored lower (49). In the following section, each of the three principles is examined in more detail, highlighting particular aspects that influenced the overall score for each particular principle.

3.4.2 Explicit purpose

The findings of the study indicate that the majority of the organisations interviewed were in strong agreement that wetland rehabilitation was necessary to address the wetland problems. Five of the six organisations interviewed indicated that a statement of purpose existed and was explicit to them. However, most of the organisations indicated that they were not involved in the process of developing the statement of purpose for the rehabilitation initiative, which was the factor that most significantly lowered the overall score for the explicit shared purpose. However, although not involved in its development, some of the organisations indicated that to a large extent their interests were addressed in the statement of purpose. Therefore their support was gained. The explicit shared purpose was contained in a

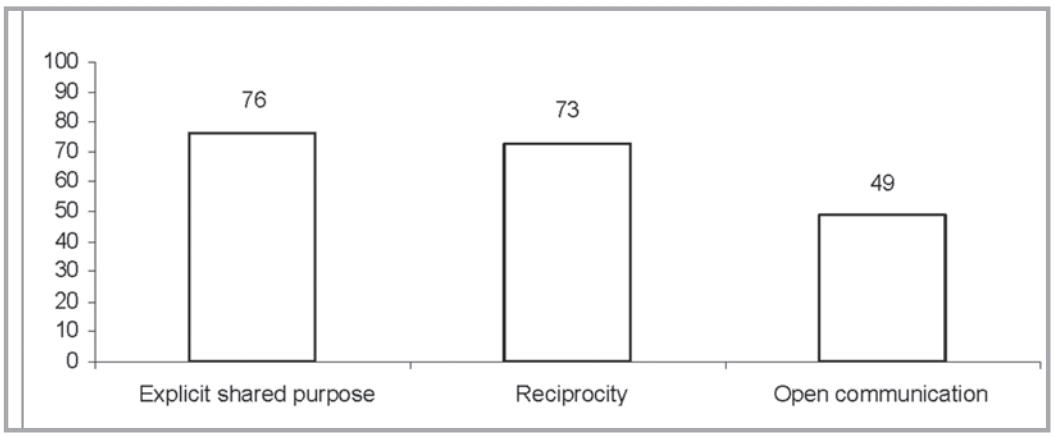

Figure 4.2: Aggregated scores for the three principles of effective collaboration for the Rietvlei Wetland-Rehabilitation Initiative (ranging from 0, where the principle was poorly achieved, to 100, where the principle was well achieved). Each percentage score is derived from the aggregated scores from several relevant questions and represents an average for the six organizations that were interviewed

clearly documented rehabilitation plan for the Rietvlei wetland, which was regularly referred to during the rehabilitation initiative. However, some organisations indicated that the rehabilitation plan focused too much on problems within the wetland and did not address the wider wetland issues (e.g. pollutant inputs from the upstream catchment).

3.4.3 Reciprocity

Reciprocity was assessed by asking individual organisations to assess what they receive from their involvement in the initiative relative to what they contribute. The findings from our study indicate that the respondents benefited from the complementary resources provided by other organisations. This led to a high support of the initiative by the various organisations. However, not all organisations were clear on their role in the initiative. The roles of the various involved parties were not clearly articulated in the rehabilitation plan, and these were never fully clarified through other means. This reduced the level of contribution, as organisations did not have a clear path of entry for contributing to the initiative.

The respondents acknowledged well their inter-dependency with other organisations, and that no organisation was self-reliant in meeting their tasks and mandates, and required other organisations' support. Even so, respondents felt that their organization contributed slightly more than they gained from working together. An important factor contributing to this was the lack of clarity regarding roles. Some respondents also indicated that there were some organizations that should have participated more in the initiative. One respondent said that "*organisations can contribute much more than they are doing.*"

3.4.4 Open communication

For this report, open communication consists of the following elements: information quality (accuracy, timeliness and adequacy), information dissemination within and outside the initiative, and information assimilation in the initiative. Communication with organisations outside of the rehabilitation initiative was considered to be better than communication within the initiative. External information dissemination was associated with field days, a wetland newsletter and regular reports. Regarding communication problems within the initiative, one of the respondents noted:

> *"Channels are not established in which this contribution can take effect. Many people don't know where to go to seek help or support when faced with a problem. We don't know who does what in organisations. This information is lacking. Liaison is required between organisations to know what resources and opportunities exists among organisations ...possibly there exists some unexploited potential. The wetland forum would be of good use in this, but the forum is not functioning as it should ...the forum attendance has been very erratic."*

Although strategies for information dissemination were indicated to be present, information assimilation and dispersion scored low, and this was associated with low information generation and the fact that communication was restricted mainly to the landowner (Tshwane Metropolitan Council) and the lead agency (WfWetlands), as indicated by one of the respondents:

> *"Communication was only restricted to WfWetlands programme and Tshwane Metropolitan Council (Reserve). There was very little external communication, but it is currently improving."*

Information quality was perceived to be low, with information timeliness, adequacy

and accuracy all scoring low. One of the respondents identified that a language barrier was an impairment to open and effective communication and it reflected negatively on information quality. However, probably the most important factor affecting the quality of communication was that it was often not clear to those involved in the initiative who needed what information. It becomes inefficient and impractical to communicate everything to everybody. For example, a contractor constructing a concrete weir will require specific, focused information on the dimensions of the structure and its precise location and the materials required for its construction. However, an organization such as Friends of Rietvlei, who do not have an active interest in the details of the implementation of the rehabilitation interventions, primarily require information on the long-term outcomes of the rehabilitation interventions and how different threats are being addressed in order to sustain these outcomes.

3.5 Organisational behaviours examined in relation to the problem situations

The organisational behaviour characterising the different phases of the project was described, based on the information gathered from the interviews and from documentation dealing with the project, and is presented in Table 4.5. This description of organizational behaviour was carried out according to the classes given in Table 4.1 and the problem situation was described according to the framework given in Figure 4.1. The described behaviour type was then compared to the 'recommended' type given in Figure 4.1, which represented that being most appropriate for the given problem situation (e.g. if the level of agreement on the outcomes and the level of certainty about the outcomes are both high then tolerance is recommended as the most appropriate type of behaviour).

The greatest need for collaboration was probably in the post-planning of the project, which needed to address the question of how to sustain the outcomes of the rehabilitation in the long term (and was associated with high levels of uncertainty). However, as can be seen from Table 4.5, the behaviour exhibited was mainly coordination, with one organization playing a much more prominent role than any of the others. This is probably the area that would have benefited most from a greater investment in joint problem solving and decision making, particularly involving the landowner.

Although the need for collaboration was less in the initiation and planning and the monitoring and evaluation phases of the rehabilitation initiative than it was in the post-planning phase, there was nonetheless uncertainty associated with these phases and a need to work together to agree upon an appropriate course of action. Thus cooperative behaviour was also required in these phases and could have been improved, mainly through better developed and more focused communication (e.g. by better clarifying 'who needs to know what').

During the implementation phase there was a high level of agreement about the interventions that needed to be implemented (as detailed in the rehabilitation plan) and a reasonable certainty about the outcomes (although the certainty was not considered high because some of the rehabilitation methods applied in the initiative had not yet been widely applied in wetlands). Thus the predominant approach of coordination that was applied was considered to be appropriate for the situation. Therefore it would have been inappropriate to have invested a great deal more resources in promoting much higher levels of cooperative behaviour during this phase.

Table 4.5: Observed and recommended organizational behaviours examined in relation to the problem situations encountered in the Rietvlei wetland rehabilitation project cycle

Phases in the project cycle	The problem situation			Organizational behaviour	
	Level of agreement about outcomes	Level of certainty about outcomes	Observed in the Rietvlei project	Recommended as appropriate according to Figure 4.1	Correspondence between 'Observed' & 'Recommended'
Initiation and planning	Intermediate	Moderately low	Cooperation/ coordination	Collaboration/ cooperation	Moderate
Implementation	High	Intermediate	Coordination/ tolerance	Coordination/ tolerance	Good
Monitoring and evaluation	Intermediate	Moderately low	Cooperation	Collaboration/ cooperation	Moderate
Post-planning	Moderately low	Moderately low	Coordination/ cooperation	Collaboration	Moderately poor

4 Conclusion

WfWelands has two primary functions: to promote the sustainable use of wetland resources and to rehabilitate degraded wetlands so that they can better serve society. The former is open-ended and long term. The latter involves a focused intervention that is commonly technically oriented and short-term. There is an implied assumption that short-term interventions, rehabilitation in particular, will initiate a process of aftercare leading to sustainable use. This study provides a stark illustration of the challenge that WfWetlands faces as it attempts to use a rehabilitation intervention as a springboard for long term sustainable use.

The wetland management process exemplified in the *WET-Management* series is based on the assumption that participatory planning (deriving a shared vision and an explicit statement of purpose) ahead of a rehabilitation intervention will promote collaborative behaviour in the long-term. This case study suggests some important lessons:

1. Although parties indicated that there was an explicit purpose, it became clear that while all parties thought that controlling erosion and facilitating re-flooding was important, some indicated that addressing broader-scale catchment water quality objectives was missing from the objectives. This suggests that the planning process did not generate the feeling of reciprocity that was necessary for all actors to sense that their mandates were being addressed. The lesson here is that reciprocity must be addressed explicitly so that stakeholders are able to account to their constituencies. Weakness in reciprocity undermines attempts to promote and sustain collaborative behaviours without which the intentions of sustainable use cannot be achieved.
2. Reciprocity does not mean that all should benefit at the same time or to the same extent. It is in the nature of wetland rehabilitation that there will be lags between intervention and outcome, particularly as cause and effect are by no means predictable with certainty. The study suggests that the connection that some saw between re-flooding and the wetland health, including capacity to enhance water quality, was not appreciated by all parties. Or, perhaps the extent of benefit for some was

perceived to be too uncertain, delayed or insufficient to enable the party to account to its constituency. Reciprocity involves trade-offs and these must be well-informed so that agencies can account to their constituencies. The lesson here is that weakness in social learning undermines willingness to collaborate. A comprehensive strategy for continuous co-learning and communication with stakeholders and constituencies must be included with every rehabilitation intervention.

3. WfWetlands seeks to use a focused rehabilitation intervention to draw parties into long-term collaboration. The assumption is that having an *explicit statement of purpose* will achieve this. The study indicates that the relationship between an explicit statement of purpose that is visionary and a statement of purpose for an intervention may not have been understood or even accepted by all parties. Collaboration is an emergent process (i.e. it happens as a result of something). The study shows that neither the *explicit statement of purpose*, nor the technical rehabilitation intervention, caused collaboration to emerge in a way that is sustainable. Just because a party agrees to the statement of purpose does not mean it will commit to collaboration. The lesson here is that in arriving at an explicit statement of purpose, parties should derive their own *explicit statement of purpose* so that the relationships between statements become clear and can be related to specific mandates.

4. The rehabilitation intervention in the Rietvlei case study, and likely in many others, was amenable to a 'plan and control' approach. Contractors must work according to the plan and tasks must be completed in sequence. Successful completion requires coordination. Those implementing the plan are not the same as those among whom WfWetlands seeks to promote collaboration. The lesson is that this distinction should be appreciated and the assumption that plan and control processes will lead directly to cooperation at higher levels is invalid.

5. Whilst completion of the intervention is undoubtedly a *performance indicator* for WfWetlands, it is less so for other parties for whom the outcomes that follow are the measures of success and so these need to be explicit. Re-flooding and protecting peat might be appropriate outcomes for WfWetlands but they may be less so for others. The lesson is that outcomes and performance indicators must be specific to parties if they are to foster collaboration.

6. Collaboration is a requirement for achieving the goal of sustainable use of wetland resources. This study has illustrated the importance of understanding and measuring progress toward collaboration. Striving for collaboration must be deliberate, and progress in achieving collaboration must be measured and evaluated so that corrective action can be implemented. The lesson here is that collaboration emerges from how we do what we do. It must be addressed strategically.

The application of the framework for assessing effective collaboration to the Rietvlei case study provided useful insights, and it is suggested that this framework has wider application to other wetland rehabilitation projects. The complexity of wetland rehabilitation and management will inevitably require that different parties (each with their particular interests) work together to achieve a shared purpose. The framework presented and applied in this study provides an approach for understanding better how this can be done and for identifying areas that could be improved or which require

further exploration. In these applications it is important that users should feel free to adapt it to suit the particular needs of their assessment, rather than applying the guidelines in a rigid way. In addition, it must be emphasised that when applying the framework, the emphasis is not on a scoring in order to see if an initiative has 'passed' or 'failed'. Instead it should be seen more as a tool to be used in a process of co-learning that helps to build understanding and provide prompts for possible courses of action.

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References for Glossary (opposite)

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6 Glossary

Adaptive management	A systematic process for continually improving management policies and practices by learning from the outcomes of management actions.
Alien species	Plant or animal species that does not occur naturally in an area.
Biodiversity	The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.
Biophysical	The biological and physical components of the environment.
Biotic	Living components of the environment.
Catchment	All the land area from mountain top to sea shore which is drained by a single river and its tributaries. Each catchment in South Africa has been subdivided into secondary catchments, which in turn have been divided into tertiary. Finally, all tertiary catchments have been divided into inter-connected quaternary catchments. A total of 1946 quaternary catchments have been identified for South Africa. These subdivided catchments provide the main basis on which catchments are subdivided for integrated catchment planning and management (consult DWAF [1994]).
Collaboration	The most complex organizational behaviour, where the goals and aims of every party are focused on a common vision of what is desired. A greater level of interdependence than cooperation, often involving a combination of human and financial resources and the development of a new, common identity.
Communication, open	A situation where actors have access to information that they need to develop understanding, learn together and make informed decisions.
Cooperation	Cooperation involves different entities working together for mutual benefit, with the realization that their success is aided by the success of others. Entities maintain their distinct identities, yet also achieve shared objectives. Problem solving is often shared. Cooperation is characterised by active, respectful negotiations.
Coordination	A 'plan and control' behaviour, but more complex than tolerance. Usually two or more entities provide services to a client or programme. Decision makers consciously engage in observing a problem and creating solutions within existing structures (i.e. shared problem solving is limited). Communication between organizations is usually through established written or verbal procedures.

Corrective action	Action required to correct problems identified during the monitoring process. Major corrective actions are those that are required due to non-compliance with legislation, Occupational Health and Safety requirements, BMPs, social responsibilities or the wetland rehabilitation objectives of the programme. Minor corrective actions are those that are required due to non-compliance with the rehabilitation plan and BMPs, but are not at a level significant enough to prevent the objectives of the project from being achieved.
Ecosystem	A system in which there is constant interaction between the biotic and abiotic components and in which nutrients are cycled.
Ecosystem services	The direct and indirect benefits that people obtain from ecosystems. These benefits may derive from outputs that can be consumed directly; indirect uses which arise from the functions or attributes occurring within the ecosystem; or possible future direct outputs or indirect uses (Howe *et al.*, 1991). Synonymous with ecosystem 'goods and services'.
Evaluation	Assessment of the effectiveness of a project against pre-determined objectives, usually based on monitoring (Rutherfurd *et al.*, 2000).
Explicit shared purpose	A purpose that is clearly stated and which was developed in an inclusive way, such that it reflects the interests of the different actors.
Extent of impact	The proportion of a site affected by a given activity
Gully	A well defined channel carved by water on a hillside.
Head cut	The upper-most entrance into an erosion gully. The point where the headward extension of a gully is actively eroding into undisturbed soil.
Hectare equivalent of health	The health of a wetland expressed on a scale of 0 (pristine) to 1 (critically impacted) multiplied by the size of the wetland in hectares.
Hillslope seepage wetland	Slopes on hillsides, which are characterised by the colluvial (transported by gravity) movement of materials. Water inputs are mainly from sub-surface flow and outflow is via a well-defined stream channel or via diffuse flow.
Indicator	Visible sign of human-induced impact.
Invasive species	A species that has the capacity to out-compete and dominate the naturally occurring species.
Inventory	Wetland inventory is the process of determining and recording where wetlands are, how many wetlands are in a given area, and their characteristics.
Magnitude of impact	The actual impact of a particular activity / suite of activities on the component of ecosystem health being evaluated.

Management effectiveness	Effective management is strategic in the sense that it is guided by a vision and objectives and the implementation of actions necessary to achieve these, adaptive in the sense that there is an ongoing process of monitoring and evaluation and adjustment to account for the lessons learnt, and inclusive of the key stakeholders that affect and are affected by the ecosystem.
Monitor	To keep a check on, and record of something, which would allow changes to be detected.
Monitoring	The regular, systematic gathering of information based on observations and measurement of change in wetland characteristics in relation to a pre-defined state, in order to provide the data for evaluation (Water and Rivers Commission, 2002).
Natural resource management	Management of resources associated with a natural ecosystem.
Natural Resource Management Programme (NRMP)	A programme promoting the effective management of natural resources through various means, including protection, awareness raising and physical means such as the construction of physical rehabilitation measures.
Objectives	The specific, measurable desired outcomes of a project or management action.
Outcome (Rehabilitation)	The effect on ecosystem health and ecosystem services of an intervention in the rehabilitation process, often explicitly set out in the objective/s of the rehabilitation project.
Output (Rehabilitation)	A physical intervention and its survival objectives (e.g. flood magnitude that can be withstood by the structure) as specified in the rehabilitation plan.
Participation	A process through which stakeholders influence and share control over development initiatives and the decisions and resources which affect them.
Performance indicator	Attributes that are used to evaluate the progress of the system towards meeting the rehabilitation objectives (Streever, 1999).
Ramsar Convention on Wetlands	An intergovernmental treaty which provides the framework for international cooperation for the conservation of wetland habitats.
Reciprocity	The principle of reciprocity can be referred to as that of give and take, where each of the actors contributes meaningfully as well as benefiting meaningfully.
Rehabilitation (wetland)	The process of assisting in the recovery of a wetland that has been degraded, or of maintaining a wetland that is in the process of degrading so as to improve the wetland's capacity for providing services to society.

Riparian	"*The physical structure and associated vegetation of areas associated with a watercourse which are commonly characterized by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.*" (National Water Act). Riparian areas that are saturated or flooded for prolonged periods would be considered wetlands and could be described as riparian wetlands. However, some riparian areas are not wetlands (e.g. where alluvium is periodically deposited by a stream during floods but which is well drained).
Stakeholder	In the context of a wetland, a stakeholder is taken to mean any individual, group or community living within the influence of the wetland site, and any individual, group or community likely to influence the management of the site.
Sustainable use	Defined by the Ramsar Convention on Wetlands as "*human use of a wetland that yields the greatest continuous benefit to present generations while maintaining the potential to meet the needs and aspirations of future generations.*" Sustainable use of a specific natural resource requires that use be within the resource's capacity to renew itself, i.e. it should not be beyond the resource's biological limits.
Threat	An indication of likely danger or harm.
Tolerance	The least complex organizational behaviour. A "plan and control" behaviour with sublimated, automatic, routine, responses. Only marginal communication is required because individuals assume their roles without conscious effort, interaction or engagement.
Transformed areas	Areas where wetland habitat has been completely destroyed.
Water quality	The purity of the water, determined by the combined effects of its physical attributes and its chemical constituents.
Wetland	"*Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which in normal circumstances supports or would support vegetation typically adapted to life in saturated soils.*" (National Water Act). Land where an excess of water is the dominant factor determining the nature of the soil development and the types of plants and animals living at the soil surface (Cowardin *et al.*, 1979); land that is sometimes or always covered by shallow water or has saturated soils long enough to support plants adapted for life in wet conditions.
Wetland's catchment	The area, up-slope of the wetland, from which water flows into the wetland and including the wetland itself.
Wise use	Synonymous with sustainable use.

Working for Wetlands

Working for Wetlands (WfWetlands) uses wetland rehabilitation as a vehicle for both poverty alleviation and the wise use of wetlands, following an approach that centres on cooperative governance and partnerships. The Programme is managed by the South African National Biodiversity Institute (SANBI) on behalf of the departments of Environmental Affairs and Tourism (DEAT), Agriculture (DoA), and Water Affairs and Forestry (DWAF). With funding provided by DEAT and DWAF, WfWetlands forms part of the Expanded Public Works Programme (EPWP), which seeks to draw unemployed people into the productive sector of South Africa's economy, gaining skills while they work and increase their capacity to earn income. Rehabilitation projects maximise employment creation, create and support small businesses, and transfer relevant and marketable skills to workers.

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The Water Research Commission

The Water Research Commission (WRC) aims to develop and support a representative and sustainable water-related knowledge base in South Africa, with the necessary competencies and capacity vested in the corps of experts and practitioners within academia, science councils, other research organisations and government organisations (central, provincial and local) that serve the water sector. The WRC provides applied knowledge and water-related innovations by translating needs into research ideas and, in turn, transferring research results and disseminating knowledge and new technology-based products and processes to end-users. By supporting water-related innovation and its commercialisation where applicable, the WRC seeks to provide further benefit for the country.

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