Wetland Management Series

WET-Legal

Wetland rehabilitation and the law in South Africa

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Front cover: Wetland vegetation in coastal dune slacks between Hangklip and Silversands in the Western Cape.
Photograph: Japie Buckle

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 provides 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 underway.

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 this provides 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 or assessing the Present Ecological State of a wetland in an Ecological Reserve Determination.

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 5 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 underway 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, evaluate and report on performance.

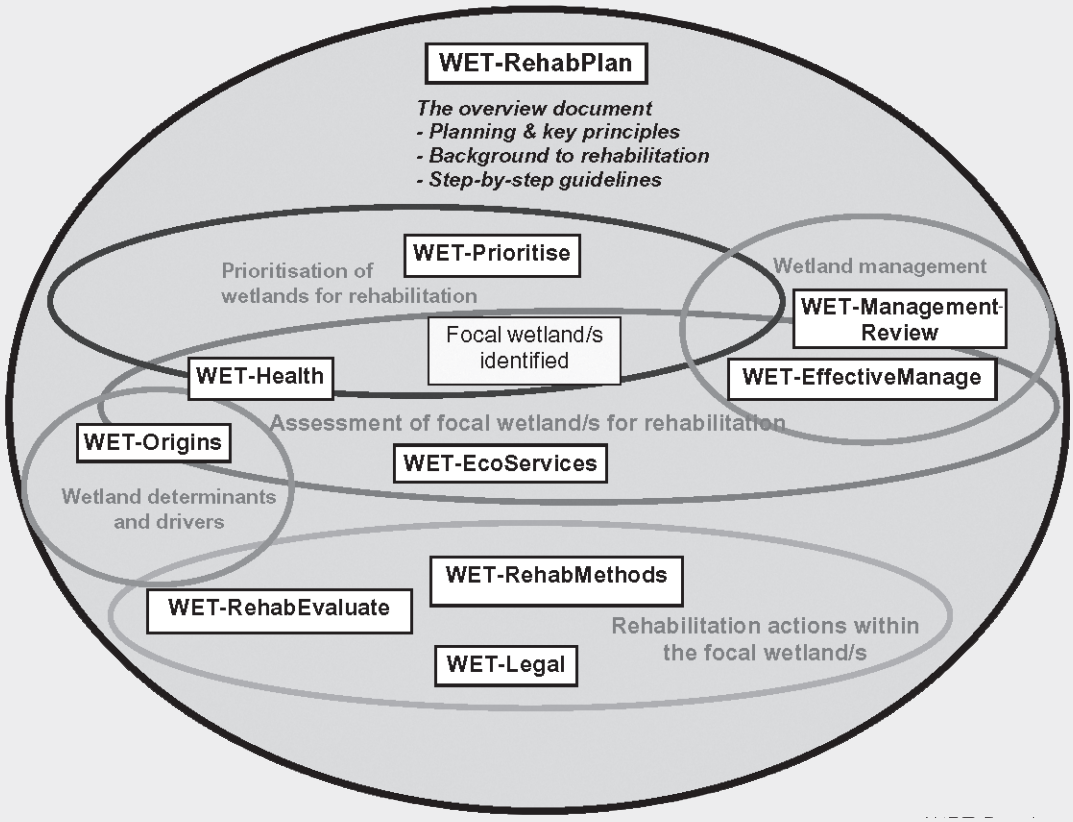

Figure 1P: How do the *WET-Management* tools relate to each other in a rehabilitation context?

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-LEGAL*

South Africa has a vast range of environmental legislation, covering general environmental management principles, as well as laws relating to specific components of the environment.

It also imposes on all citizens of South Africa, including the general public as well as statutory authorities, the duty to uphold the principles of sustainable development. The protection of wetlands is covered by a number of these pieces of legislation, including those that pertain to water resources, conservation and biodiversity, and agricultural land.

This document maps legislation as it applies to the rehabilitation of wetlands. It identifies, lists and/or describes:

- laws compelling wetland rehabilitation
- specific sections of legislation where wetland rehabilitation activities require authorisation
- the general responsibilities of those tasked with rehabilitating wetlands, including the responsibility of landowners
- parties responsible for ongoing monitoring of wetland rehabilitation outputs and outcomes, and
- issues of liability that may arise through inappropriate action relating to wetland management and rehabilitation.

This document has two major sections. The first is a 'roadmap' covering the legislation that pertains to activities in wetlands. The second describes physical interventions and activities used in wetland rehabilitation that require authorisation in light of current legislation. The potential negative impacts associated with completed rehabilitation interventions, and means of avoiding or mitigating these impacts, are also described.

Acknowledgements

The Water Research Commission (WRC), South African Biodiversity Institute (SANBI) and Working for Wetlands (WfWetlands) are gratefully acknowledged for funding the development of this tool. The research programme that oversaw the development of this and other tools 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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Acronyms: General and of legislation and government notices contained in this document

Acronyms (general):

CBD	Convention on Biological Diversity
CMA	Catchment Management Agency
DAEA:	Department of Agriculture and Environmental Affairs (KwaZulu Natal Provincial Department)
DEAT	Department of Environmental Affairs and Tourism
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
GDACE	Gauteng Department of Agriculture, Culture and Environment
IAP	Interested and Affected Parties
NEPAD	New Partnership for Africa's Development
RP	Rehabilitation Project
SANBI	South African National Biodiversity Institute
UN	United Nations
WfWetlands	Working for Wetlands
WSSD	The World Summit on Sustainable Development

Acronyms (for legislation contained in this document):

Biodiversity Act	National Environmental Management: Biodiversity Act 10 of 2004
CARA	Conservation of Agricultural Resources Act 43 of 1983
The Constitution	Constitution of the Republic of South Africa Act 108 of 1996
ECA	Environment Conservation Act 73 of 1989
ECA EIA regs	GNR 1182 and 1183 0f 5 September 1997, as amended
GNR	New Government Regulation
NEMA	National Environmental Management Act 107 of 1998
NEMA EIA regs	GNR 385,386 and 387 of 21 April 2006
NFA	National Forests Act 84 of 1998
NHRA	National Heritage Resources Act 25 of 1999
NWA	National Water Act 36 of 1998
Protected Areas Act	National Environmental Management: Protected Areas Act 57 of 2003
Regs	Regulations

1 INTRODUCTION: WETLAND REHABILITATION AND THE LAW

Wetlands are defined in the National Water Act as '*land which is transitional between terrestrial and aquatic systems*'. In view of the fact that they are transitional, they are subject to a wide range of legislation that reflects their location as well as their importance in the landscape and to society, including the National Environmental Management Act (NEMA), the Conservation of Agricultural Resources Act (CARA), the National Water Act (NWA), the Environment Conservation Act (ECA), and the National Forests Act (NFA). Despite their value to humans and the environment, wetlands have been widely damaged and/or destroyed in South Africa (Kotze *et al*., 1995).

Working for Wetlands (WfWetlands) is a unit established under the South African National Biodiversity Institute (SANBI), and has been commissioned by the Department of Environmental Affairs and Tourism (DEAT) to undertake a collaborative project to identify and rehabilitate specific wetlands in South Africa in accordance with the law and agreements with landowners.

This document maps out the principles from policy and legislation which relate to the protection of wetland ecosystems, activities requiring authorisation, laws compelling rehabilitation, activities of necessity, responsibility of user and monitoring, as well as issues of liability (Figure 1 and Chapter 2). This document also describes those activities that require authorisation in light of the legislation, particularly as wetland rehabilitation interventions may lead to unintended impacts, which have legal implications (Chapter 3). Given this, Working for Wetlands and those partner institutions with a mandate, need to ensure that they have acted with due consideration of existing legislation.

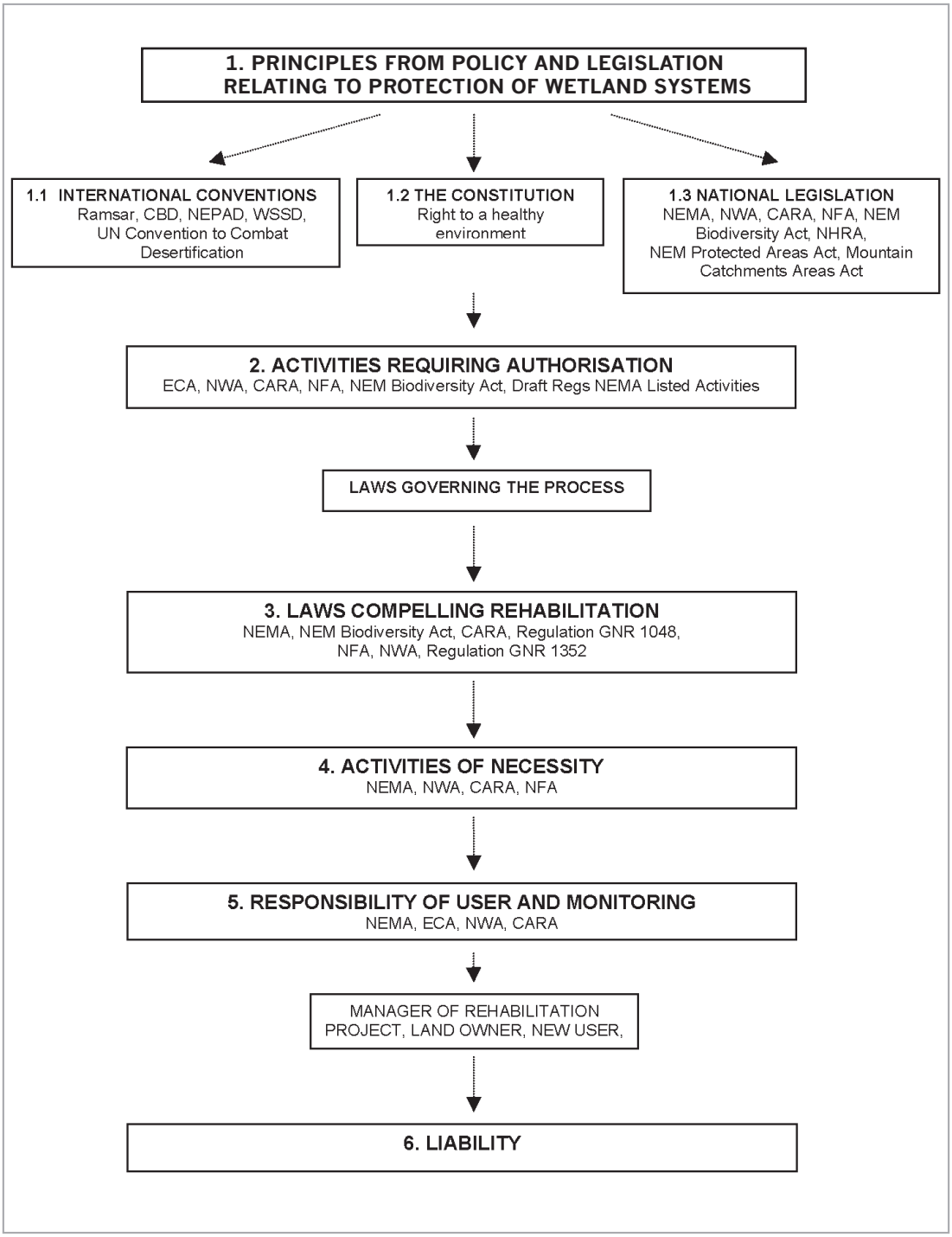

Figure 1: A summary of the legislation that deals with the protection, management and rehabilitation of wetlands as described in the roadmap (Chapter 2)

2 ROADMAP TO WETLANDS AND WETLAND REHABILITATION LAW

This chapter identifies international conventions and South African legislation that deal with wetlands and wetland rehabilitation. Box 1 presents a summary of the South African legislation that relates to wetlands and wetland rehabilitation, and Box 2 refers readers to the Acts and government regulations that relate to each section of the roadmap. The boxes and figures in this chapter are presented on pp.34 and 38.

2.1 Principles arising from policy and legislation related to the protection and rehabilitation of wetland ecosystems

2.1.1 International conventions

THE RAMSAR CONVENTION: Emphasis is placed on the ecological, economic and social feasibility of wetland-restoration programmes. Countries should establish national programmes and priorities for wetland restoration.

CONVENTION ON BIOLOGICAL DIVERSITY: Wetland rehabilitation is an important tool for the *in-situ* conservation of biodiversity. Countries are to rehabilitate and restore degraded ecosystems, and promote the recovery of threatened species through the development and implementation of plans and management strategies.

UNITED NATIONS CONVENTION TO COMBAT DESERTIFICATION: Countries are to respond to land degradation and the effects of drought, which includes the rehabilitation, conservation and sustainable management of land and water resources.

NEW PARTNERSHIP FOR AFRICA'S DEVELOPMENT (NEPAD): Wetland conservation and sustainable use is one of eight themes under the environment initiative.

THE WORLD SUMMIT ON SUSTAINABLE DEVELOPMENT (WSSD): The plan of implementation places emphasis on actions that reduce the risk of flooding in drought-vulnerable countries through the promotion of wetland and watershed protection and restoration.

2.1.2 The Constitution of the Republic of South Africa Act 108 of 1996 (The Constitution)

Everybody has a right to have the environment protected through legislative or other means that:

- prevent ecological degradation and pollution
- promote conservation, and
- secure the sustainable ecological development and use of natural resources.

2.1.3 National Legislation

National Environmental Management Act, 1998 (NEMA)

- Sustainable development takes social, economic and environmental factors into account in all planning and decision-making processes.
- Disturbance of ecosystems and the loss of biodiversity should be avoided or should be addressed through mitigation.
- Decision makers should adopt a risk-averse and cautious approach.
- The environmental option that affords the most benefit and the least damage, at a cost acceptable to society in the long- and short-term, should be adopted.
- There must be responsibility throughout the life cycle of a project.
- Decision must recognise all forms of knowledge, including traditional and ordinary knowledge.
- Integrated environmental management

principles should always be employed.
- Care should be taken to prevent pollution and environmental degradation.
- A 'polluter pays' principle should be enforced (where the polluter is:
  - a person who is, or was, responsible for, or who directly or indirectly contributes to environmental pollution or degradation of land;
  - the owner of the land or the owner who is the successor in title;
  - the person in control of the land who has the right to use the land or who has negligently failed to prevent the pollution or degradation from occurring).
- Protection of 'whistle blowers' is guaranteed.
- All people have the right to access to information.
- Legal standing to enforce environmental laws is extended to almost any person in the interest of protecting the environment.
- Liability in respect of criminal proceedings for offences listed in schedule 3 of the Act extends to omissions on the part of any manager, agent or employer who fails to take all reasonable steps to prevent an offence from occurring, as well as to a director of a firm who fails to take all reasonable steps to prevent the commission of an offence. Proof of the said offence shall constitute *prima facie* evidence.
- Environmental management co-operation agreements may be entered into by the Minister, any MEC or municipality with any person or community for the protection of the environment.
- There are set procedures for the investigation, assessment and communication of any activity that requires environmental authorisation.

The National Water Act 36 of 1998 (NWA)

- The intention of the Act is to protect South Africa's water resources and associated ecosystems and their biological diversity.
- A water course includes a wetland, lake or dam into which, or from which, water flows.
- A water resource includes a water course.
- A wetland means land which is transitional between terrestrial and aquatic systems, where the water table is usually at or near the soil surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.
- The Water Act serves to reduce and prevent the pollution and degradation of water resources.
- The Water Act serves to assist with the management of floods and droughts.
- The national Government is the public trustee of the nation's water, and is tasked with protecting its water resources.
- Duty of care must be taken to prevent pollution of a water resource from occurring, continuing or recurring.
- The 'polluter pays' principle applies to water resources (the polluter is:
  - a person who is, or was, responsible for, or who directly or indirectly contributes to environmental pollution or degradation of land;
  - the owner of the land or the owner who is the successor in title;
  - the person in control of the land who has the right to use the land or who has negligently failed to prevent the pollution or degradation from occurring).
- The Minister may expropriate land for rehabilitation and remedial work.
- The Minister must establish national monitoring systems for water resources.

Conservation of Agricultural Resources Act 43 of 1983 (CARA)

- The intention of the Act is to control the over-utilisation of South Africa's natural agricultural resources, and to promote the conservation of soil and water resources and natural vegetation.
- Erosion means the loss of soil through the action of water, wind, ice or other agents including the subsidence of the soil.
- Soil conservation work means any work that is constructed on land for:
  - the prevention of erosion or the conservation of land;
  - the conservation of vegetation or the surface of the soil;
  - the drainage of superfluous surface- or subterranean-water;
  - the conservation or reclamation of any water resource; and
  - the prevention of the silting of dams and the pollution of water.
- The Minister may prescribe control-measures that may include the utilisation and protection of vleis, marshes, water-sponges, water courses and water sources.
- If the Minister is of the opinion that the restoration and reclamation of natural agricultural resources is necessary, the land may be expropriated for this purpose.

National Forests Act 84 of 1998 (NFA)

- The purpose of the Act is to protect and promote the sustainable-use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.
- The Minister may publish criteria, indicators and standards that relate to the protection and use of forests.
- The Minister should monitor forests.
- The Minister may declare an area protected if it is not already protected under any other legislation.

Natural Heritage Resources Act 25 0f 1999 (NHRA)

- The purpose of the Act is to protect South Africa's natural and cultural heritage.
- Development means any physical intervention that may result in a change to the nature, appearance or physical character of a place, or influence its stability or future well-being.
- A national estate may include landscape and natural features of cultural significance.

National Environmental Management: Biodiversity Act 10 of 2004 (Biodiversity Act)

- The intention of the Act is to protect species and ecosystems and promote the sustainable-use of indigenous biological-resources.
- The State is the trustee of biological diversity.
- This Act establishes the South African National Biodiversity Institute.
- The Institute may co-ordinate the implementation of programmes for the rehabilitation of ecosystems.
- The Minister or MEC may publish a national or provincial list of ecosystems that are threatened and that are in need of protection.
- A threatened ecosystem may include:
  - those experiencing severe degradation of ecological structure, function or composition through human intervention; and
  - protected ecosystems of high conservation value.
- Duty of care relating to alien species and listed invasive species is mandated.

National Environmental Management: Protected Areas Act 57 of 2003 (Protected Areas Act)

- The intention of the Act is to protect and conserve ecologically viable areas and their natural landscapes.
- Ecological integrity means the sum of the biological, physical and chemical components of an ecosystem, and the interactions which maintain the ecosystem and its products, functions and attributes.
- Environmental goods and services are those outcomes of natural processes that benefit society directly or indirectly, such as flood control and detoxification.
- The State is the trustee of protected areas.
- Protected areas include:
  - special nature reserves, nature reserves and protected environments
  - world heritage sites
  - specially protected forest areas, and
  - mountain catchment areas.
- A protected environment is declared for:
  - owners to take collective action to conserve biodiversity
  - protection of areas sensitive to development, and
  - protection of provision of environmental goods and services.
- Protected areas should be managed by management authorities and management plans are required.

The Mountain Catchments Areas Act 62 of 1970

The intention of the Act is to provide for the conservation, use, management and control of land situated in mountain catchment areas.

Other Acts or Legislation

- Attention is drawn to the World Heritage Conventions Act 49 of 1999 - wetlands in world heritage sites under the control of the management authority and the relevant municipality.
- Seashore Act 21 of 1935 and the Marine Living Resources Act 18 of 1998 contain the definitions of estuarine and inland waters. Certain wetlands may fail to be governed by some of the provisions of these acts.
- Provincial and local government legislation may have specific relevance to specific instances within those jurisdictions. These must be considered on a case by case basis.

2.2 Activities that require authorisation

2.2.1 National Environmental Management Act (NEMA)

The Minister may identify:

- activities that may not commence without environmental authorisation. (GNR 386 and 387);
- geographic areas in which specified activities require environmental authorisation for the conservation of biological diversity, water resources, landscape or geological features;
- geographical areas based on specific attributes in which specified activities may be excluded from authorisation. (It may be possible for WfWetlands to motivate to the Minister to identify WfWetland rehabilitation projects as being within a specific 'geographical framework' – with certain attributes – thereby not requiring authorisation).

NEMA Environmental Impact Assessment regulations:

The decision-making tree in Figure 2 (at the end of the chapter) describes the process of assessment, authorisation and/or exemption that is required for rehabilitation of wetlands that may be listed activities under NEMA Environmental Impact Assessment regulations, GNR 385 (pertaining to process) and 386 and 387 (pertaining to listed activities).

GNR 385 of 21 April 2006 – process regulations

The activities listed here require a basic assessment to be undertaken, as described in regulation GNR 385.

- 1(m): Any purpose in the one in ten year flood line of a river or stream, or within 32 m from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including:
  (i) canals
  (ii) channels
  (iii) bridges
  (iv) dams, and
  (v) weirs.

- 4: The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding five cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland.
- 12: The transformation or removal of indigenous vegetation of three hectares or more or of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem that is threatened or in need of protection. (This list of ecosystems has not been published yet.)

'canal' refers to an open structure that is lined or reinforced for the conveying of a liquid or that serves as an artificial watercourse.

'channel' refers to an excavated hollow bed for running water or an artificial underwater depression to make a water body navigable or to improve the flow of water in a natural stream, river or the sea.

'floodplain' refers to a discernible flat landscape feature next to a river or stream that was created by weathering and sedimentation over time.

GNR 387 of 21 April 2006 – full scoping and EIA required

The activity listed here will require a full scoping phase and an impact assessment phase to be undertaken, as described in regulation GNR 385.

- 10: Any threatening processes in listed ecosystems. (This list has not been published yet.)

GNR 385 of 21 April 2006 – process regulations

- Activities on land owned by a person other than applicant. If the applicant is not the owner of the land on which the activity is to be undertaken, the applicant must, before applying for an environmental authorisation in respect of that activity, obtain the written consent of the landowner to undertake the proposed activity on that land
- Before applying for environmental authorisation of an activity, applicants must appoint an environmental assessment practitioner (EAP) at their own cost to manage the application.
- These regulations set out in the procedures for a basic assessment to be undertaken (Figure 3).
- A land owner or a manager of a rehabilitation project (RP) may apply for an exemption from any provision in respect of a specific activity (Figure 4). Public participation is required unless the rights or interests of other parties

are not likely to be adversely affected by exemption.

- The Minister may declare a geographic area to be regulated by an environmental management framework (EMF). It is possible for WfWetlands to motivate to the Minister to declare this programme to be governed by an EMF for wetlands.

Proposed amendments to the NEMA regulations of 13 June 2008 (GN 31144)

All proposed amendments are still subject to change.

GNR 659 of 13 June 2008

If the applicant is not the owner, manager or person in control of the land on which the activity is to be undertaken, the applicant must, before applying for an environmental authorisation in respect of that activity, where reasonably possible give written notice of the proposed activity to the owner, manager or person in control of the land on which the activity is to be undertaken, and inform such person the owner of the land that he may participate in the public participation process as contemplated in regulation 56.

GNR660 of 13 June 2008 – basic assessment required

1(m): Construction of facilities or infrastructure any purpose in the one in ten year flood line of a water course or wetland, or within 32 metres, whichever is the greater, from the bank of a watercourse or edge of a wetland excluding purposes associated with existing residential use, but including:

(i) canals
(ii) channels
(iii) bridges
(iv) dams
(v) weirs, and
(vi) stormwater outlet structures.

4: a) The infilling or depositing of any material of more than 5 cubic meters into a watercourse, estuary, lake, in-stream dam or wetland, or

b) The dredging, excavation, removal or moving of soil, sand or rock exceeding five cubic metres from within

i) the one in ten year flood line of a watercourse, estuary, lake, in-stream or within 32 meters, whichever is the greater, from the bank of a watercourse;
ii) the one in ten year flood line of a wetland or within 32 meters, whichever is the greater, from the edge of a wetland;
iii) the sea or the seashore.

But excluding where such dredging, excavation, infilling, removal or moving of soil or rock is for the maintenance of dredging purposes.

5: The reclamation or destruction of a wetland or any portion thereof.

12: The transformation or removal of indigenous vegetation of:

i) five hectares or more anywhere, or
ii) of any size where the transformation or removal would occur within a critically endangered or an endangered ecosystem listed in section 52 of NEM Biodiversity Act, or prior to such publication within an area that has been identified in the National Spatial Biodiversity Assessment 2004; or
iii) 1 hectare or more in Protected Areas as per NEM: Protected Areas Act.

Reference to virgin land activities has been removed.

Proposed new and amended definitions:

''channel'' means an excavated hollow bed for running water or an artificial underwater depression to make a water body navigable in a natural water course, river or the sea.

''construction'' means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure.

''dam'' means any barrier dam and any other form of impoundment used for the storage of water.

''derelict land'' means abandoned land or property where the lawful/legal land use right has not been exercised during the preceding ten year period.

''indigenous vegetation'' means vegetation consisting mostly of indigenous plant species occurring naturally in an area.

''marina'' means a constructed waterway that is normally associated with residential or commercial use and that could include mooring faculties.

''virgin soil'' - removed, not in amendment.

''watercourse'' means:

a) a river or spring;
b) a natural channel in which water flows regularly or intermittently;
c) a wetland lake or dam into which or from which a river flows; and any collection of water which the Minister may by notice in the Gazette declare to be a watercourse and reference to a water course where relevant includes its beds and banks.

''wetland'' refers to 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 land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

There are also proposed references to areas relating to coastal activities that will have limited application to this wetland series, if any. Reference can be had to the proposed Integrated Coastal Management Bill, when it becomes an Act in due course.

GNR 661 of 13 June 2008 – scoping and full EIA required

No relevant activities identified or amended. Reference to activities in a listed ecosystem has been removed and included in GNR 660 amendments.

2.2.2 Environment Conservation Act 73 of 1989 (ECA)

The activities listed under this Act have been repealed. However, the procedure under the ECA remains relevant in respect of activities that commenced before 3 July 2006 that have not yet been completed.

These activities are subject to the environmental impact assessment procedures as listed in GNR 1183 of the 5 September, 1997, as amended. The following are of relevance:

- Certain activities in respect of a river: the construction of canals; the modification of channels and the construction of structures that cause disturbance to the flow of water in the river bed.
- Construction of dams, levees and weirs (note that what constitutes a levee or weir may be subject to interpretation).
- With respect to change of land use from agricultural to any other land use which may impact on a wetland.
- The reclamation of wetlands (this may be of limited application in terms of wetland rehabilitation).

2.2.3 National Water Act (NWA)

Water use must be licensed unless its use is excluded.

- The following are not permitted (under section 21 of the NWA):
  - impeding or diverting the flow of water within the water course
  - stream-flow reduction activities
  - altering the bed, banks, course or characteristics of the water course.
- However as a general authorisation under GNR 398 of 26 March 2004, a person who owns or lawfully occupies a property, or who has access to land on which the use of water takes place, ***may*** impede or divert the flow of water ***if***:
  - it does not impact on a water resource or on another person's water use, property or land
  - there is no interference with the natural migration patterns of the aquatic biota and the sustainable economic ecological-functioning
  - the structure does not exceed a foundation width of 15 m, a length of 200 m or which occurs within a distance of 500 m upstream or downstream of another structure that impedes or diverts flow on the same water course
  - the volume of flow is not reduced;
  - the impedance or diversion does not detrimentally affect the quality of the water
  - strict erosion control measures are taken during and after the construction to ensure that no erosion takes place
  - all necessary measures are taken to stabilise the diversion structure and the surrounding area
  - a person who uses water in terms of this must register this water-use as a general authorisation.
- If the criteria listed above are not met, a licence would be required.
- Also as a general authorisation under GNR 398 of 24 March 2004, a person who owns or lawfully occupies a property, or who has access to land on which the use of water takes place, ***may*** alter the beds, banks or characteristics of a water course ***if*:**
  - it is not within a distance of 500 m upstream or downstream from the boundary of a wetland
  - it is not within a distance of 500 m upstream or downstream from the salt water mixing zone of the estuary
  - the natural migration patterns of aquatic biota and sustainable ecological functioning of the system are not interfered with
  - the alteration activity does not extend for more than 50 m continuously or accumulative distance of 100 m on that property or land measured along the water course
  - the volume of flow is not reduced
  - strict erosion control measures are taken during and after construction, to ensure no erosion of the bed and banks of the river takes place
  - the water quality is not detrimentally affected
  - a person who uses water in terms of this must register this water use as a general authorisation.
- If the criteria listed above are not met, a licence would be required.

Note: Where necessary refer to *KZN DAEA Wetland Guidelines, 2002* and the *GDACE guidelines* which also govern wetland management.

2.2.4 Conservation of Agricultural Resources Act (CARA)

Authorisation is required to:

- drain or cultivate any vlei, marsh or water sponge
- cultivate any land within the flood area of a water course or within 10 m outside the flood-area of a water course
- divert run-off from a water course, or
- burn veld, including wetland vegetation.

2.2.5 National Forests Act (NFA)

- Authorisation is required to cut, disturb, manage or destroy any indigenous, living tree in a natural forest.
- No person may cut damage or destroy any forest product or remove or receive any forest product in a natural forest or in a protected area without a licence.

2.2.6 NEM: Biodiversity Act (Biodiversity Act)

- Activities that require authorisation (still to be published in the Government gazette):
  - Disturbance to ecosystems that are threatened or in need of protection.
  - Disruption of environmental processes within an ecosystem.
  - Harm of threatened or protected species.
  - Restricted activities regarding alien species and invasive species.

2.3 Laws that compel rehabilitation

2.3.1 National Environmental Management Act (NEMA)

- The loss or disturbance of ecosystems and loss of biological diversity must be avoided.
- The pollution and degradation of the environment must be avoided.
- The disturbance of landscapes and sites that constitute the Nations' cultural heritage must be avoided.
- The use and exploitation of non-renewable and renewable natural resources must be avoided.
- The development and exploitation of renewable resources and ecosystem of which they are part, must not exceed the level beyond which the integrity is jeopardised.
- Sensitive, vulnerable, highly dynamic or stressed ecosystems such as wetlands require specific attention.
- A duty of care rests in all persons to avoid environmental degradation and pollution.

2.3.2 NEM: Biodiversity Act

- The South African National Biodiversity Institute may co-ordinate and finance programmes for the rehabilitation of ecosystems.
- The Minister may publish national lists of ecosystems that are threatened and in need of protection, as may a provincial MEC.

2.3.3 Conservation of Agricultural Resources Act (CARA)

- This Act does not apply to land in urban areas, except with respect to the provisions relating to alien invader plants.

- The executive officer of the Department of Agriculture may order a land-user to comply with a particular control measure.
- The Minister may establish a scheme, and any person participating in such a scheme who fails to satisfy the conditions of a scheme is guilty of an offence.
- Every land-user and his successor-in-title shall maintain soil-conservation work.

2.3.4 CARA: Regulation GNR 1048 of 24 May 1984 as amended

- This regulation is relevant as follows:
  - it does not apply to land in an urban area or in a mountain catchment-area
  - weeds and invader plant provisions of the Act apply to all land, including urban areas
  - the provisions relating to the burning of veld shall not apply to a private forest defined in the Forest Act, 1968.
- Except on authority no land-user shall:
  - cultivate any virgin soil
  - cultivate any land with a slope of more than 20% or more than 12% as specified in column 1, 2 or 3 of the regulation, unless the land already under cultivation is effectively protected.
- Every land-user shall protect cultivated land against excessive soil loss through:
  - the construction of soil conservation work
  - the cultivation of land such that the run-off speed of water is restricted
  - the utilisation of crop rotation
  - the alternation of crop strips
  - leaving crop residue on the land, and
  - the utilisation of grazing crops.
- The executive officer may direct additional measures.
- Every land-user shall:
  - protect cultivated land against wind erosion
  - prevent waterlogging and sanitation of irrigated land
  - remove the vegetation in a water course so as not to constitute an obstruction during a flood
  - not divert any run-off water from a water course to any other water course
  - effect an obstruction that will reduce the natural flow-pattern of run off, and
  - remove or alter an obstruction in the natural flow pattern of runoff on his farm.

The above is in order to prevent excessive soil loss and may be undertaken on authorisation.

- Every land-user shall:
  - protect the veld on his farm (veld refers to land that is not being, or has not been cultivated, and on which indigenous vegetation or other vegetation is, or can be, utilised as grazing for animals)
  - adhere to the grazing capacity of veld by restricting the number of animals that may graze, and
  - prevent and control veld fires.
- Every land-user shall restore or reclaim land on which excessive soil loss due to erosion has occurred.
  - The restoration and reclamation of disturbed or denuded land must take place in accordance with certain measures.
- A land-user shall control any Category 1 plant that occurs on his land
- Category 2 plants may not occur on any land other than in a demarcated area or in a biological-control reserve.
  - A water-use licence for a stream-flow reduction activity in terms of the National Water Act shall be deemed to be a demarcated area.
- Category 3 plants shall not occur on

any land other than in a biological-control reserve.
    - No land-user shall allow category 3 plants to occur within 30 metres of the 1:50 year flood line.
- Prescribed methods of control should be adhered to.
- A land-user shall prevent the deterioration of natural resources and shall combat bush-encroachment.

2.3.5 National Forest Act (NFA)

- The Minister is responsible for the management of the protected area and may make rules to achieve the purpose of the protected area. The Minister may grant financial assistance to the registered landowner.

2.3.6 National Water Act (NWA)

- The Minister must determine the class of water-resource and resource-quality objectives, and must give effect to the determination of the reserve.
- A duty of care rests on the owner of the land, a person in control of the land or a person who occupies or uses the land, to take all reasonable measures to prevent pollution of a water resource.
- A person who is responsible for an incident; or who owns a substance involved in an incident or who was in control of a substance involved in an incident, must take all reasonable measures to contain and minimise the effects of an incident and any other such measures that a Catchment Management Agency (CMA) may require.
- Water-resource management is delegated to Catchment Management Agencies.
- A Catchment Management Agency must advise interested persons on:
    - the protection, use for development, conservation, management and control of water resources
    - the development of a catchment management strategy
    - the co-ordinated activities related to water uses
    - the co-ordination of any relevant development plan, and
    - the promotion of community participation in the control of water resources.
- The Minister may establish bodies to implement international agreements in respect of the management of water resources with neighbouring countries.
- The Minister may establish and operate government waterworks and fund such works.
- A holder of a servitude must maintain the servitude area, and repair and maintain infrastructure relating to the servitude and access roads.
- A person who lawfully impedes or diverts the flow of water in a wetland, or who alters the beds, banks or characteristics of a wetland must take necessary measures to stabilise the diversion structure and surrounding area through:
    - rehabilitation of the riparian habitat
    - using only indigenous shrubs and grasses
    - rehabilitation of disturbed and degraded riparian areas
    - restoring and upgrading the riparian habitat integrity to sustain a biodiverse riparian ecosystem
    - removal of alien vegetation, and
    - conducting an annual habitat assessment.

2.3.7 Regulation GNR 1352 of 12 November 1999

- Every person in control of a mine must prevent the pollution of a water resource and must rehabilitate residue deposits.

2.4 Activities of necessity

2.4.1 National Environmental Management Act (NEMA)

- If there is a risk of significant pollution or degradation of the environment and urgent action is necessary, the Director General or Provincial Head of Department may issue a directive to any person who fails to take adequate measures. Such a directive will include the assessment of the impact of activities and the timing of commencement and completion of reasonable measures. The Director General or Provincial Head of Department may undertake those measures himself should a person fail to do so, and claim back any costs from relevant persons.
- Where an emergency incident has occurred, the responsible person has to report the incident to the authorities, and take all reasonable measures to contain and minimise the effect of the incident. The relevant authority can direct the responsible person to take certain measures or the relevant authority may take the measures it considers necessary to contain and minimise the effect of the incident. The relevant authority may claim re-imbursement of all reasonable costs.

2.4.2 National Water Act (NWA)

- The same two provisions in NEMA (above) are found in the National Water Act except that the Director General is replaced by the Catchment Management Agency under the NWA.
- A National, provincial or local sphere of government may impede or divert the flow in a water course to control storm water, remove alien vegetation, conduct hydrological monitoring or manage floods.
- In terms of the NWA, the Minister must make a determination of the reserve (which consists of ecological needs as well as basic human needs). This will have an effect on the classification of rivers, and may impact on the rated significance of associated wetlands.

2.4.3 Conservation of Agricultural Resources Act (CARA)

- A soil conservation work shall be maintained by every land-user.
- Every land-user shall protect the cultivated land on his farm unit against excessive soil loss as a result of erosion through the action of water. This should be achieved through:
  - the maintenance of a soil conservation work
  - cultivation in a specified manner that restricts run-off
  - the use of crop rotation
  - the use of undisturbed alternate strips
  - crop residue left on land, and
  - the use of a crop for grazing.
- Every land-user shall, following crop removal, protect the cultivated land on his farm unit against excessive soil erosion as a result of the action of the wind. This should be achieved through:
  - using specific cultivation-methods that restrict the movement of soil particles by wind
  - maintaining strips of natural vegetation at right angles to the prevailing wind
  - the establishment of wind breaks
  - the use of a crop-rotation system
  - the use of alternate strips of undisturbed natural vegetation
  - not allowing land to be left fallow, and
  - avoiding cultivation during periods of high winds.
- Every land-user shall protect the irrigated land on his farm unit against waterlogging and salination.

- No land-user shall utilise the vegetation in a vlei, marsh or water sponge, or within the flood area of a water course, or within 10 m horizontally outside such flood area.
- Every land-user shall remove the vegetation in a water course to prevent a blockage.
- Every land-user shall protect the veldt on his farm against deterioration and destruction.
- Every land-user shall effectively restore or reclaim the land on his farm on which excessive soil loss due to erosion has occurred.
- A land-user shall control any category 1 plants that occur on inland water surfaces.
- A land-user shall control any category 2 plants that occur on land or inland waters.
- Unless authorised, no land-user shall allow category 2 plants to occur within 13m of the 1:50 year flood line of a river, stream, spring or natural channel in which water flows into a lake, dam or wetland.
- A land-user shall control category 3 plants, which should not occur on any land or inland water surfaces.
- No land-user shall allow category 3 plants to occur within 30 m of the 1:50 year flood line of a river, stream, spring or natural channel in which water flows into a lake, dam or wetland.
- Methods of control for category 1, 2 or 3 plants that the land-user must implement are:
  - uprooting, felling, cutting or burning
  - treatment with a weed killer
  - biological control in terms of the Agricultural Pests Act, 1983
  - any other method of treatment recognised by the Executive Officer
  - a combination of the above.
- A land-user shall prevent the deterioration of natural resources and combat bush encroachment where it occurs.
- Note also the Sustainable Use of Agricultural Resources Bill, which provides for the sustainable-utilisation of natural agricultural resources, including control over the subdivision and change of use of agricultural land and prime and unique agricultural land, in support of biodiversity and control over the spreading of weeds and invader plants.

2.5 Responsibility of user and monitoring

2.5.1 National Environmental Management Act (NEMA)

Manager of rehabilitation project

1. The manager of a Rehabilitation Project (RP) is a representative of an organ of state. All the practices of sustainable development and integrated environmental management apply to a manager of an RP:
   - The disturbance of ecosystems and loss of biological diversity be avoided or remedied.
   - The pollution and degradation of the environment be avoided or remedied.
   - The disturbance of landscapes be avoided or remedied.
   - The application of a risk-averse and cautious approach.
   - The application of a best, and practical, environmental option.
   - That the responsibility for the environmental health of a project exists through its life cycle (including monitoring).
   - The promotion of the participation of interested and affected parties.
   - Making decisions in an open and transparent manner.

- The intergovernmental co-ordination and harmonisation of policy.
- The avoidance of conflicts between organs of state.
- The discharge of global and international responsibilities relating to the environment.
- The environment be held in public trust for the people, and be protected as the people's common heritage.
- The cost of remedying pollution and the environmental degradation be paid for by those harming the environment.
- Specific attention be given to sensitive, vulnerable and highly dynamic ecosystems.

2. Conciliation and arbitration measures are set out in the event of a dispute involving the manager of a RP and the landowner.

3. The manager of an RP must:
- identify, predict and evaluate:
  - the actual and potential impact on the environment, socio-economic conditions and cultural heritage
  - the risks and consequences of their activities
  - alternatives and options for mitigation of activities.
- ensure that the effects of the activities on the environment receive adequate consideration before actions are taken.
- ensure the consideration of environmental characteristics that may be negatively impacted on the site and apply due management.
- identify and employ the modes of environmental management best suited to ensuring a particular activity is pursued in accordance with the principles of environmental management (including monitoring).
- ensure a proper investigation of the environment likely to be significantly effected by the rehabilitation.
- investigate the potential impact and its alternatives on the environment and assess the significance of that impact.
- investigate mitigation measures to keep adverse impacts to a minimum as well as the option of not implementing the activity.
- report on gaps in knowledge and adequacy of protective measures.
- investigate and formulate arrangements for the monitoring and management of the impacts and the assessment of the effectiveness after implementation.

4. The general duty of care and remediation of environmental damage rests on all persons who cause, have caused or may cause significant pollution or degradation of the environment. Such persons are to take reasonable measures to prevent such pollution from occurring, continuing or recurring. Such measures include:
- Investigating, assessing and evaluating the impact of their activities on the environment.
- Informing and educating employees about the environmental risks of their work, and about the manner in which their tasks should be performed.
- Eliminating any source of pollution or degradation.
- Remedying the effect of the pollution or degradation during and after implementation.
- The Director General or Provincial Head of Department may recover costs for the undertaking of such investigations from the manager of the RP or the landowner should they fail to comply with this duty of care. The Minister may expropriate the necessary rights in respect of that land for the benefit of the person undertaking the rehabilitation or remedial work, and may recover all costs incurred from the person for whose benefit the expropriation was affected.

5. Both the manager of RP and the landowner are responsible for the control

of any emergency incidents and must:

- Report to the Direct General, the South African Police Services, the Fire Prevention Service, the relevant Provincial Head of Department or municipality, and all persons who are affected by the incident. Such a report must include the nature of the incident, the substances involved and the initial measures taken to minimise the impact, the cause of the incident,and measures taken and to be taken to avoid a recurrence of such an incident.

6. All persons are entitled to access to environmental information unless such information is protected in the interests of public security and in accordance with the Protection of Access to Information Act.

7. An environmental management inspector may make routine inspections on any activity to ensure the compliance with the legislation.

8. Environmental management co-operation agreements can be entered into with the manager of a RP, a landowner, a municipality and the MEC of the relevant environmental authority.

Landowner

The landowner must ensure that the best practical environmental option is pursued. Such a person must also ensure that:

- the disturbance of ecosystems and loss of biological diversity is avoided or minimised.
- pollution and degradation of the environment is avoided or minimised.
- waste is avoided and minimised.
- responsibility for the environmental health of an activity exists through its life cycle.
- the cost of remedying any pollution and environmental degradation is paid for by those responsible for harming the environment.
- sensitive, vulnerable, dynamic or stressed ecosystems such as wetlands are given specific attention.
- environmental characteristics that may be negatively impacted on the site are considered, and that due management is applied.
- the modes of environmental management best suited to ensuring particular activity are identified and employed.
- the principles of environmental management are pursued.
- the investigation and formulation of arrangements for the monitoring and management of impacts are addressed.
- notice is taken that it is an offence for a person to reclaim a wetland or to continue with an activity which may in due course be a listed activity relating to a wetland.

The landowner or the manager of the RP, if he is the holder of the environmental authorisation may at any time apply for an amendment of the authorisation.

The landowner or the manager of a RP may apply for an exemption from any provision in respect of a specific activity, including public participation if the rights or interests of other parties are not likely to be adversely affected by exemption from conducting a public participation process.

The Minister may declare a geographic area to be regulated by an environmental management framework (EMF). It is possible for Working for Wetlands to motivate to the Minister to declare this programme to be governed an EMF.

2.5.2 NEMA: regulation GNR 385 of 21 April 2006 and proposed amendment 659 of 13 June 2008.

NEMA: regulation GNR 385 of 21 April 2006

The Manager of a RP must, before applying for an environmental authorisation in respect of that activity, obtain the written consent of the landowner to undertake the proposed activity on that land.

NEMA: Proposed amendment – regulation 659 of 13 June 2008

The manger of an RP must, before applying for an environmental authorisation in respect of that activity, where reasonably possible give written notice of the proposed activity to the owner, manager or person in control of the land on which the activity is to be undertaken, and inform such person the owner of the land that he may participate in the public participation process as contemplated in regulation 56.

2.5.3 Environment Conservation Act (ECA)

- The reclamation of a wetland is a listed activity that cannot be undertaken without an authorisation. (This applies if commenced with pre July 2006).
- A concerned government institution (potentially the manager of a RP) may take such steps as may be deemed fit in respect of any activity undertaken by a person, the result of which seriously damages, endangers or detrimentally affects the environment.
- No person, including the State, shall be liable in respect of anything done in good faith in the exercise of a power conferred on him under this Act.

As discussed in paragraph 2.2.2 above, the ECA remains relevant to those activities that were commenced with prior to the 3 July 2006 and remain incomplete.

2.5.4 The National Water Act (NWA)

The landowner, the person in control of the land or the person who occupies or uses the land, must:

- prevent any pollution being caused to a water resource, and must take all reasonable measures to prevent such pollution from occurring.
- report and control any incident that could pollute a water resource.
- obtain a licence to divert or impede the flow of water in a wetland or alter the banks, bed or characteristics of a wetland. (Subject to the general authorisation discussed at 2.2.3 relating to a person who has legal entitlement to the land, allowing some interventions but subject to conditions precedent). Such a licence must include the management practices and general requirements for water conservation measures, the plans for monitoring and reporting on every water use or a water ·management plan.
- take necessary measures to stabilise the diversion structure and surrounding area if the flow of water has been impeded or diverted, by:
  - rehabilitating the riparian habitat
  - only using indigenous shrubs and grasses
  - rehabilitating the disturbed and degraded riparian areas
  - restoring and upgrading the integrity of the riparian habitat sustain a bio-diverse riparian·ecosystem
  - removing alien vegetation, and
  - conducting an annual habitat·assessment.
- A national, provincial or local sphere of Government may impede or divert the flow in a water course to control stormwater, to remove alien vegetation, to conduct hydrological monitoring or to manage floods.

2.5.5 Conservation of Agricultural Resources Act (CARA)

- Every land-user shall continue to remove the vegetation in a water course.
- Every land-user shall control category 1, 2 and 3 plants from any land or inland water surface.

2.6 Liability

2.6.1 Current legislation

a) Criminal proceedings can be instituted against a person who has contravened any of the following Acts through conducting rehabilitation of a wetland:

- The Environment Conservation Act (ECA). (If commenced with pre-July 2006)

- Conservation of Agricultural Resources Act (CARA)
  Specifically through not complying with those control measures that relate to:
  - the cultivation of virgin soil
  - the utilisation and protection of cultivated land
  - the irrigation of land
  - the prevention or control of water logging
  - the utilisation and protection of vleis and wetlands
  - the regulation of the flow pattern of the runoff
  - the control of weeds and invader plants
  - the restoration or reclamation of eroded land
  - the protection of water sources, and
  - the constructional maintenance of soil conservation works.

- National Water Act (NWA)
  It is an offence to use water other than is permitted under this Act including:
  - taking water from a water resource
  - impeding or diverting the flow of water in a water course
  - altering the beds, banks, contours or characteristics of a water course
  - failure to comply with the directive for an emergency situation or under the duty of care to prevent pollution of a water source
  - failure to register an existing lawful water use
  - intentionally refusing to perform a duty or obstructing any other person in the exercise of his/her duties, and
  - unlawfully and intentionally or negligently committing any act or a mission which pollutes or is likely to pollute a water resource, or which detrimentally affects or is likely to affect a water resource.

- Mountain Catchment Areas Act (MCAA)
  It is an offence to fail to comply with the direction pertaining to the conservation, prevention of soil erosion and the destruction of vegetation within a mountain catchment area.

b) If convicted for any of the above, the criminal provisions under NEMA also apply in that:

- An employer can be convicted for an offence with respect to an activity that has been undertaken by his employee, where the offence resulted from the failure of the employer to take all reasonable steps to prevent such an act or omission from occurring.
- A court can order a monetary award for the rehabilitation of the environment, as well as an order compelling the rehabilitation of the environment.

- Any person or group of persons may seek appropriate relief from the courts with respect to a breach or threatened breach of a provision of this Act, or any other statutory provision concerned with the protection of the environment.
- A court may decide not to award costs against a person who fails to secure the relief sought.
- Any person, in the interest of the protection of the environment, may institute and conduct a prosecution with respect to any breach of any statute concerned with the protection of the environment.

c) In respect of contraventions of NEMA *per se*, commencing a listed activity under GNR 386 or GNR 387 without authorisation, the above applies as well as:

- A person convicted of an offence is liable to a fine up to R5 million or to imprisonment not exceeding 10 years, or, if a person continues with a listed activity s/he is liable to an administration fine not exceeding R10 million, and may also be liable on conviction to a fine of up to R5 million or 10 years in prison
- A person may apply for the rectification of unlawful commencement or continuation of listed activity and provide such information or undertake such studies as the Minister or MEC may deem necessary, and upon the payment of an administration fine not exceeding R1 million.

2.6.2 Proposed legislation GNR 648 of 20 May 2008

The proposed legislation seeks to:

i) Make the duty of care provision placed on all persons under NEMA retrospective. It also seeks to incorporate the imposition of a fine of R10 million and/or 10 years imprisonment if a person is found to have unlawfully and intentionally or negligently committed an act which has caused or may cause pollution or the gegradation of the environment.

ii) Increase the fines under the ECA in respect of an activities that were regulated prior to 3 July 2006 to R5 million, or where there is no express penalty, R100 000.

iii) Increase all fines under NEMA and the other specific management acts of NEMA to up to R5 million and/or 5 years imprisonment for a first offence and R10 million and/or 10 years imprisonment for a second offence.

Box 1: Summary of legislation that pertains to wetlands and wetland rehabilitation

Fundamental Legislation contained in this document:

Biodiversity Act:	National Environmental Management: Biodiversity Act 10 of 2004
CARA:	Conservation of Agricultural Resources Act 43 of 1983
The Constitution:	Constitution of the Republic of South Africa Act 108 of 1996
ECA:	Environment Conservation Act 73 of 1989
NEMA:	National Environmental Management Act 107 of 1998
NFA:	National Forests Act 84 of 1998
NWA:	National Water Act 36 of 1998
Protected Areas Act:	National Environmental Management: Protected Areas Act 57 of 2003

Other Legislation contained in this document:

Mountain Catchment Areas Act 63 of 1970

National Heritage Resources Act 25 of 1999

Sea-Shore Act 21 of 1935

World Heritage Conventions Act 49 of 1999

Government Notices:

GNR 1048 of 24 May 1984

GNR 1182 of 5 September 1997, as amended

GNR 1183 of 5 September 1997, as amended

GNR 1352 of 12 November 1999

GNR 385 of 21 April 2006

GNR 386 of 21 April 2006

GNR 387 of 21 April 2006

GNR 392 of 4 May 2007

Box 2: Summary of legislation in the roadmap

1. PRINCIPLES from Legislation and Policy that relate to Wetland Rehabilitation

Conservation of Agricultural Resources Act 43 of 1983 (CARA)

Constitution of the Republic of South Africa Act 108 of 1996 (The Constitution)

Mountain Catchment Areas Act 63 of 1970

National Environmental Management Act 107 of 1998 (NEMA)

National Environmental Management: Biodiversity Act 10 of 2004 (Biodiversity Act)

National Environmental Management: Protected Areas Act 57 of 2003 (Protected Areas Act)

National Forests Act 84 of 1998 (NFA)

National Heritage Resources Act 25 of 1999

National Water Act 36 of 1998 (NWA)

Seashore Act 21 of 1935 (in 1.3.9 NOTE)

World Heritage Conventions Act 49 of 1999

Box 2: Continued

2. ACTIVITIES THAT REQUIRE AUTHORISATION
Conservation of Agricultural Resources Act 43 of 1983 (CARA)
Environment Conservation Act 73 of 1989 (ECA)
National Environmental Management: Biodiversity Act 10 of 2004 (Biodiversity Act)
National Forests Act 84 of 1998 (NFA)
National Water Act 36 of 1998 (NWA)
Government Notices:
GNR 1182 of 5 September 1997, as amended (ECA)
GNR 1183 of 5 September 1997, as amended (ECA)
GNR 385 of 21 April 2006 ((NEMA)
GNR 386 of 21 April 2006 (NEMA)
GNR 387 of 21 April 2006 (NEMA)
GNR 392 of 4 May 2007 (NEMA)
GNR 393 of 4 May 2007 (NEMA)
GNR 394 of 4 May 2007 (NEMA)
GNR 396 of 4 May 2007 (NEMA)
GNR 398 of 24 March 2004 (NWA)

3. LAWS THAT COMPEL REHABILITATION
Conservation of Agricultural Resources Act 43 of 1983 (CARA)
National Environmental Management Act 107 of 1998 (NEMA)
National Environmental Management: Biodiversity Act 10 of 2004 (Biodiversity Act)
National Forests Act 84 of 1998 (NFA)
National Water Act 36 of 1998 (NWA)

Government Notices:
GNR 1048 of 24 May 1984
GNR 1352 of 12 November 1999

4. ACTIVITIES OF NECESSITY
Conservation of Agricultural Resources Act 43 of 1983 (CARA)
National Environmental Management Act 107 of 1998 (NEMA)
National Water Act 36 of 1998 (NWA)

5. RESPONSIBILITY OF USER AND MONITORING
Conservation of Agricultural Resources Act 43 of 1983 (CARA)
Environment Conservation Act 73 of 1989 (ECA)
National Environmental Management Act 107 of 1998 (NEMA)
National Water Act 36 of 1998 (NWA)

6. LIABILITY
Conservation of Agricultural Resources Act 43 of 1983 (CARA)
Environment Conservation Act 73 of 1989 (ECA)
National Water Act 36 of 1998 (NWA)

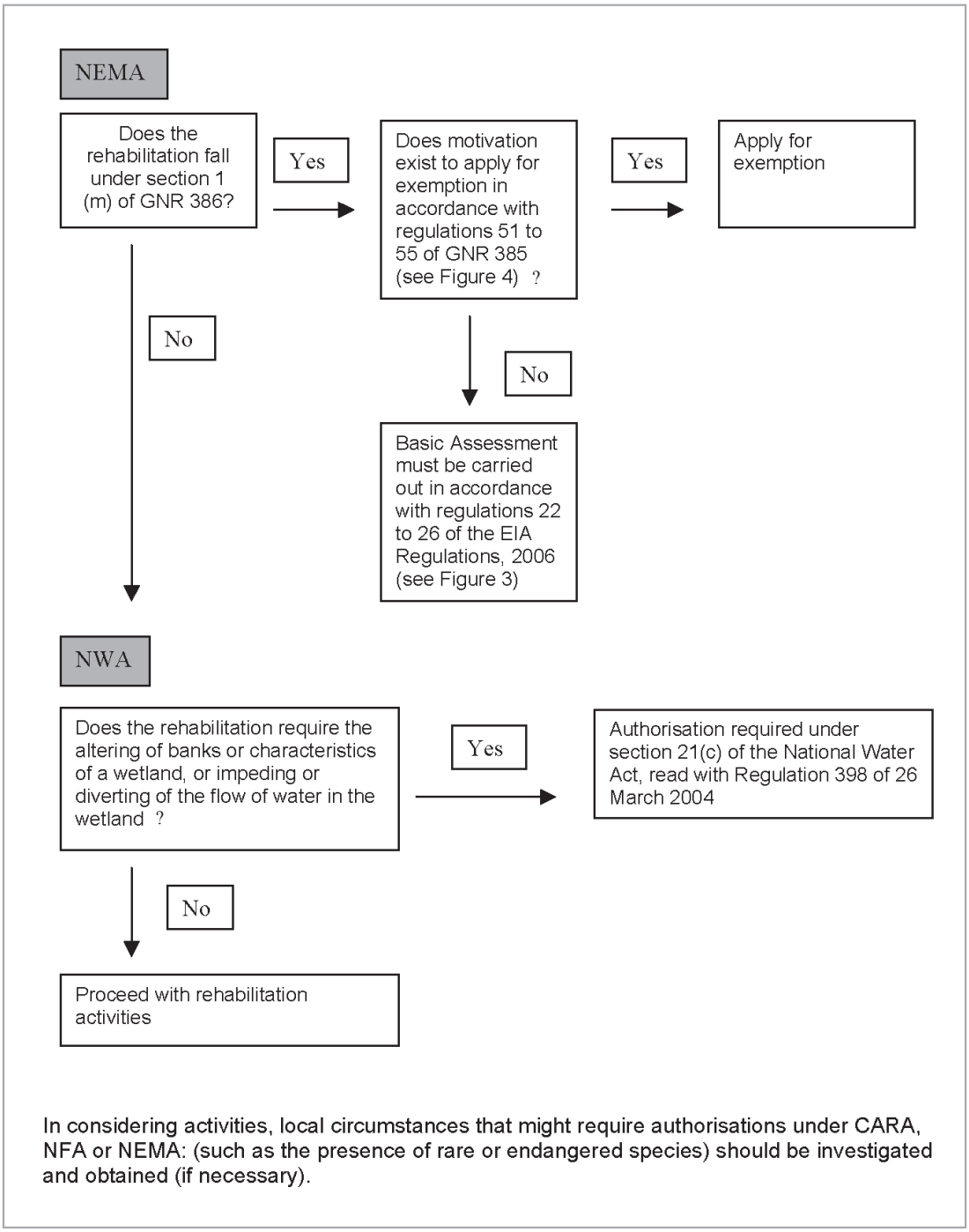

Figure 2: Wetlands decision-making tree for authorisation of rehabilitation and/or exemption from authorisation

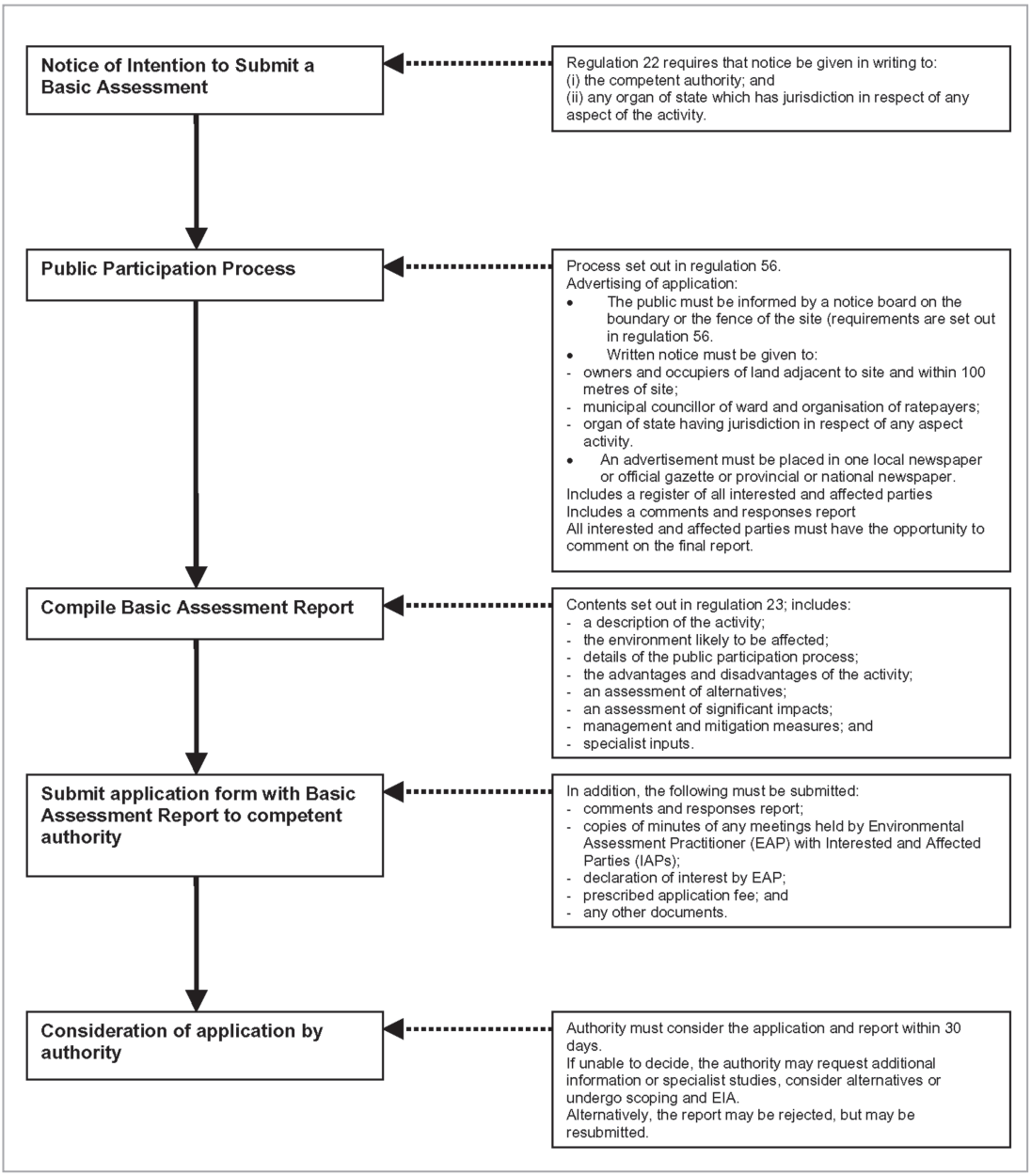

Figure 3: Procedure for basic assessment (process under NEMA regulations as per GNR 385)

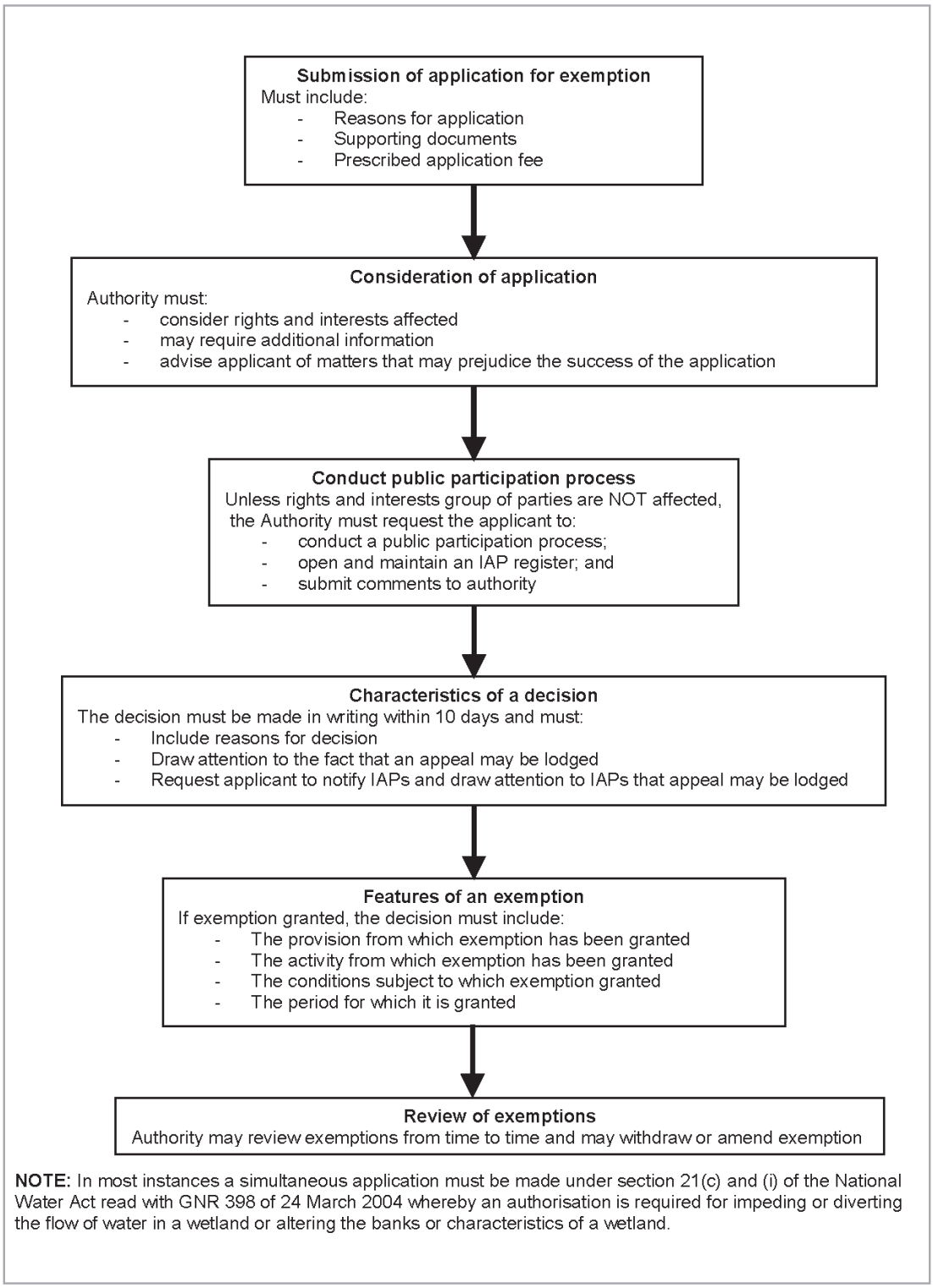

Figure 4: Process in application for exemption (in terms of regulation 51 to 55 of GNR 385)

3 ACTIVITIES, IMPACTS AND AUTHORISATIONS REQUIRED FOR WETLAND REHABILITATION INTERVENTIONS

Aldine Armstrong and Donovan Kotze

The intention of wetland rehabilitation is always to benefit the environment and society through the protection or improvement of wetland ecosystems and the goods and services that they provide. Some of the positive environmental impacts associated with wetland rehabilitation interventions are provided in Table 1 (see p.40). Given the value of wetlands for aquatic ecosystems and the fact that humans depend on aquatic resources, it is against the law to deliberately damage wetlands. The law places, directly and indirectly, the responsibility on landowners and other responsible parties, such as managers, to repair or rehabilitate damaged or lost wetlands.

While it is accepted that the purpose of wetland rehabilitation is to improve the ecological state or functioning of a wetland, poorly planned rehabilitation interventions can often cause more harm than good. Rehabilitation interventions vary considerably in terms of their potential to cause environmental impacts both in terms of the type of impact caused as well as the magnitude of the impact. Thus it is appropriate that all wetland-rehabilitation projects are scrutinized for their potential to cause unintended, negative environmental impacts.

Environmental assessments can be very costly, depending on the level of detail and the amount of administration required. The level of scrutiny to which a rehabilitation intervention is subjected should be commensurate with the potential negative environmental impacts emanating from the project. Potential negative environmental impacts of wetland rehabilitation include both those associated with the completed interventions (e.g. a concrete weir that has a negative visual impact; Table 2) and those associated with the construction of the interventions (e.g. compaction of the soil by vehicles bringing rehabilitation materials to the site; Table 3). Tables 2 and 3 assist in evaluating the unintended, negative environmental impacts of rehabilitation by highlighting potential, negative impacts associated with different types of rehabilitation interventions, together with possible means of avoiding or mitigating these impacts.

The protection of wetlands is covered in a number of pieces of legislation, each of which describes particular activities for which an authorization is required, for example the excavation of more than five cubic metres of soil from a wetland. A key issue is to know which specific rehabilitation interventions may require authorisation, and under which Act these occur, in order for the rehabilitation to be legally compliant. Table 2 and 3 also assist in this by indicating for each type of intervention which authorizations are potentially required.

There are three main legislative provisions that will have application for the typical interventions having impacts on wetlands, specifically requiring authorisation: two from the regulations promulgated under NEMA (See section 2.2.1), and two from the National Water Act, 1998 (see section 2.2.3).

It is advised, as shown in Table 2 and 3, that the potential environmental impacts that result from typical rehabilitation interventions are identified and that rehabilitation plans should consider the means of avoiding impacts or mitigating unavoidable impacts. The legislation

Table 1: Potential, positive environmental-impacts associated with the completed wetland-rehabilitation interventions

Physical interventions	Specific rehabilitation function	Potential positive environmental impacts
A weir (typically constructed of concrete or gabions) across a stream channel, artificial drainage channel or gully	1. Raises the water level in the channel.	Provides a 'water cushion' to water entering the channel, thereby assisting in controlling erosion[1]. Floods back to or above the toe of an upstream structure, thereby assisting in protecting it against erosion. Increases the level-of-saturation of the adjacent wetland area, thereby increasing its level of wetness[2].
	2. Slows the velocity of flow in the channel.	Encourages the establishment of vegetation in the channel. Assist s in controlling erosion
	3. Increases the frequency of overspill out of the channel.	Reinstates a more naturally diffuse-flow pattern across the surface of the wetland[3], and increases the level of wetness of the wetland[2].
	4. A weir against a headcut allows water to drop safely into the bed of the channel.	Assists in controlling erosion.
Sediment fence or plug[3] across a stream channel, artificial drainage channel or gully	See 1-3, above.	See above. Sediment fences and most plugs are generally suitable for low discharge situations only.
Sloping of gully head and/ or gully sides	Reduces the slope and spreads flow.	Assists in controlling erosion.
Infilling of erosion gullies or artificial drainage channels	Makes flow diffuse.	Assists in controlling erosion.
		Reinstates a more naturally diffuse-flow pattern[2] and increases the level of wetness of the wetland[1].
Planting of vegetation	Holds and covers soil and reduces flow velocity.	Assists in controlling erosion.
	Increases control over the plant species that become established.	Assist sin enhancing the quality of habitat provided by the wetland.
Spreader canal	Directs and spreads out flow out across the surface of the wetland.	Reinstates a more naturally diffuse-flow pattern[2] and increases the level of wetness of the wetland[1].
Diversion wall (typically concrete or gabion) ordiversion berm (typically earth or earth covered in concrete)	Directs flow out across the surface of the wetland.	Reinstates a more naturally diffuse-flow pattern2 and increases the level of wetness of the wetland1.
	Prevents flow from undercutting an associated structure.	Assist in controlling erosion.

[1] Controlling erosion in a wetland may have considerable benefits in terms of securing the integrity of the wetland and the many different ecosystem services provided by the wetland. This is particularly important given that in South Africa gully erosion is one of the most prominent factors drying out wetlands.

[2] Reinstating a high level of wetness may have considerable benefits in terms of securing the integrity of a wetland and the many different ecosystem services provided by a wetland e.g. carbon storage, given that hydrology is central to the functioning of wetlands

[3] Reinstating a more naturally diffuse pattern may have considerable benefits in terms of securing the integrity of the wetland and the many different ecosystem services provided by the wetland e.g. nitrate assimilation.

has been introduced to control the 'mischief' and degradation resulting from indiscriminate use and abuse of wetlands. The legislation has not distinguished between measures that may be necessary for the rehabilitation of wetlands, but they are identified in the same terms (other than mentioned above relating to the right of government bodies to effect certain interventions under the general authorisation under the NWA). Hence it is necessary to consider these controlling provisions and to identify what they are seeking to achieve, and to apply them to the perspective of rehabilitation.

Having done this and having developed standard EMPs and rehabilitation plans it may be possible to motivate to the provincial and national department departments of Environmental Affairs that generic exemptions from the implementation of these regulations, be granted based on these documents and on any other specific requirements.)

It is cautioned that the above NEMA regulations are to be amended shortly (see Section 2.2.1).

Table 2: Potential negative environmental impacts associated with the completed wetland-rehabilitation interventions, and the means of avoiding or mitigating these impacts

Physical interventions	Potential environmental impacts	Means of avoiding or mitigating the impacts	General notes	Authorisation potentially required in terms of[1]:
A weir (typically constructed of concrete or gabions) across a stream channel, artificial drainage channel or gully	Disrupts the movement of aquatic fauna.[4]	Assess potential impact (see *WET-Methods*) and include a fish ladder in the structure, where required.	Generally, the greater the height of the spillway, the greater the potential effect.	NEMA: GNR 386 Item 1 (m)[2]
	Traps bedload, which may lead to streambed incision downstream of the weir.[4]	Little that can be done to mitigate. See *WET-Health* for determining if there is likely to be a potential problem.	Consult a fluvial geomorphologist if a potential problem is identified.	
	Weirs that encourage the spreading of high flows across the wetland surface may potentially cause erosion when the water enters the channel downstream of the weir.[4]	Construction of successive weirs in the channel, such that a 'water cushion' is created by the downstream structure/s for water entering the channel. Alternatively, a chute structure can be created if there is a well-defined entry point.	See *WET-Methods* regarding the design of 'support' structures and chutes	NWA: section 21 (c) and (i) and GNR 398[3]
A sediment fence[5] or plug[6] across a stream channel, artificial drainage channel or gully	Trapping of bedload and spreading of high flows (as for weirs).	See weirs above.	Usually constructed where supply of sediment is great, and therefore unlikely to cause downstream sediment starvation.[7]	NEMA: GNR 386 Item 1(m)[2] and NWA: section 21 (c) and GNR 398
A weir located on an unstable section/ bend of a channel	The risk of structure failure, and associated impacts, is high (see impacts above).	Relocate the structure to a more stable section of the stream.	See *WET-Methods* regarding location of structures.	NEMA:GNR 386 Item 1(m) and NWA:[2] section 21 (c) and (i) and GNR 398

Any stream modifications in a floodplain	Floodplains are naturally very dynamic, and the natural processes of floodplain building can be easily disrupted by structures within a floodplain.	Where the natural sediment supply to a portion of the floodplain has been disrupted there is little that can be done to mitigate this.	Structures within floodplains must be very carefully considered, and require the expert assessment of a geomorphologist.	NEMA: GNR 386 Item 1(m)^2 and NWA: section 21 (c) and (i) and GNR 398
Sloping of gully head and/ or gully sides	Exposes to risks of erosion, which may impact negatively on the wetland and downstream aquatic habitats.	Assess, using *WET-RehabMethods*, whether bioengineering will be adequate. Ensure re-vegetation takes place as rapidly as possible (e.g. use planting, and, where required, fertilizers). Provide supplementary support (e.g. biomats, ecologs etc.) to the vegetation, where required.	Where gullies have naturally stabilised and are vegetated, sloping may result in unnecessary exposure to risks of erosion.	NEMA: GNR 386 Item 4 (possible if > 5m) and NWA: section 21 (c) and (i) and GNR 398
Infilling of erosion gullies or artificial drainage channels	Fill material may become washed away, which may impact negatively on the wetland and downstream aquatic habitats. Obtaining fill will also have associated impacts (see Table 3).	Re-vegetate the fill as quickly as possible.Temporarily divert flow, if required, until the fill has become re-vegetated.	Usually only practical for small gullies/ drains owing to the considerable volume of fill required for larger gullies/ drains.	If it is in a wetland, then NEMA:GNR 386 Item 4,(if > 5 m)^3 and NWA: section 21 (c) and GNR 398
Planting of vegetation	Introduction of alien species that spread beyond the site.	Do not use species with invasive potential (i.e. category 3 or above).		
	Use of plant material of indigenous species that is genetically different to that occurring locally, resulting in 'genetic contamination'.	Use local material.		
Spreader canal	Over time, flow concentrates and erosion develops, particularly where slope is too steep (i.e. > 1%), potentially leading to the out-flanking of a rehabilitation structure.	Ensure correct slope of the spreader canal by surveying it in the field. Maintain the spreader canal to prevent flow from concentrating.	Spreader canals are generally designed to spread water at several points along their length, but can become obstructed by the growth of vegetation.	NEMA: GNR 386 Item 1 (m)^2 and NWA: section 21 (c) and (i) and GNR 398

Diversion wall (typically concrete or gabion)	Diversions that encourage the spreading of high flows across the wetland surface may potentially cause erosion when the water enters the channe.[1]	Construct weir/s in the channel, such that a 'water cushion' is created for water entering the channel. Alternatively, a chute structure can be created if there is a well-defined entry point.	See *WET-Methods* regarding the design of 'support' structures and chutes.	NEMA: GNR 386 Item 1 $(m)^2$
Diversion berm (typically earth or earth covered in concrete)	See above. Also, if not of adequate height and it becomes overtopped, an earth berm may erode at a focal point, which can continue to focus flow & promote gully erosion.	See above. Design berm of adequate height. Exclude livestock to prevent their trampling down the berm.	Where flood discharge is low, and berms are low and well vegetated then overtopping may not be an erosion risk.	Possibly NEMA: GNR 386 Item 1 $(m)^2$ and NWA: section 21 (c) and (i) and GNR 398
Chute	Concrete chutes may cover large areas, which are unvegetated, & have a high visual impact (see below).	Little that can be done to mitigate.		NEMA:GNR 386 Item 1 $(m)^2$ and NWA: section 21 (c) and (i) and GNR 398
Any structures, particularly those of concrete, that do not become re-vegetated	Aesthetic impact, which is of particular importance where a sense of the natural environment is maintained in the general area.	Keep structure as low as possible. Where possible, e.g. the end of wing walls, avoid sharp corners. Encourage tall vegetation to grow in front of structures. Add natural colourant to concrete.	This would apply particularly to wetlands in the public view or in wilderness areas.	NEMA: GNR 386 Item 1 $(m)^2$ and NWA: section 21 (c) and (i) and GNR 398
Any structure with a high risk of failure	Failure of a structure may act to focus gully erosion, which may impact negatively on the wetland and downstream aquatic habitats.	The designs of all structures must match the anticipated flood discharge levels at a site.	Failure may result from many factors relating to both design and implementation (see *WET-Methods*).	GNR 386 Item 1 $(m)^2$
Any intervention resulting in an increased level of wetness[8]	Reduced agricultural potential cultivation and/or grazing. Increased difficulty of crossing the area.In an urban context in particular, increased nuisance of mosquitoes.	All landholders to be consulted to determine their use of the wetland, and whether increased wetness would interfere with this.Alternative crossing points may exist. Obtain input from a mosquito expert.	In some cases, such intervention will have positive impacts for the landholder (e.g. enhanced dry season grazing).	Potential NEMA:GNR 386 Item 4 and 1 $(m)^2$ and NWA: section 21 (c) and (i) and GNR 398

Any intervention resulting in an increased level of flooding across the wetland surface	Increased risk to road-crossings or other infrastructure in the area of increased flooding.	Check the area to be flooded for any infrastructure.	As indicated in Table 1, increased flooding in the wetland is likely to reduce downstream flood intensity.	Potential NEMA:GNR 386 Item 4 and 1(m)[2] and NWA: section 21 (c) and (i) and GNR 398
Any intervention resulting in the increased growth of tall vegetation (e.g. in response to the increased level of wetness)	In an urban context, in particular, this may provide increased opportunities for criminals to hide.	Promote the growth of shorter vegetation. Promote more open water.	Increased cover for wildlife.	

[1] The authorisations would fall under NEMA regulation 386 1 (m) and 4. Under NWA section 21 (c) and (i). If the intervention is by a landowner, then in certain circumstances, he may be exempt from having to apply for a licence by virtue of regulation 398 of 24 March 2004 – see discussion at 2.2.2. Also if the intervention is being undertaken on behalf of government within its jurisdiction for the purposes of hydrological monitoring, stormwater control, removal of alien vegetation , canalization and dredging of a watercourse, maintenance and development of infrastructure, ensuring safety of public, property and livestock, and the management of flood damage and potential flood damage.

[2] Under section 24(5) of NEMA, 1998; GNR 386 of 21 April 2006, effective from 3 July 2006 – regulation 1(m): any purpose in the one in ten year flood line of a river or stream, or within 32 metres from the bank of a river or stream where the flood line is unknown, excluding purposes associated with existing residential use, but including:
(i) canals;
(ii) channels;
(iii) bridges;
(iv) dams; and
(v) weirs.

[3] Under section 21(c) of the National Water Act, 1998: An authorisation is required under the Water Act for impeding or diverting the flow of water in a water course, wetland or any water resource, unless it falls under the general authorisation. (See 2.2.2 above).

[4] A weir or any other structure obstructing flow is much less likely to have any negative environmental impact if located in an artificial drainage channel or erosion gully than in a stream channel, especially if the stream channel has no clear indications of incision. Impacts from trapping of bedload by an obstruction would apply particularly to situations where downstream of the obstruction the stream is located on sediment, through which incision of the stream bed can readily occur. In contrast, a stream on bedrock would be protected from incision, and streams with boulder or gravel beds would be less likely to become incised than streams with sand or silt beds.

[5] Typically constructed of shade cloth, brush, logs or concrete fencing.

[6] Typically constructed of earth or rock packs.

[7] If sediment supply is great then the accommodation space behind any structure is likely to quickly fill and sediment will continue to move through the system.

[8] This is most difficult to assess when there are several different parties with rights to use the same wetland, as typically occurs in wetlands under communal tenure regimes. In some cases, re-wetting of a wetland may favour some parties, e.g. those involved in community-based tourism, but disadvantage those parties cultivating in the wetland.

Table 3: Potential environmental impacts associated with the construction and/or implementation of the interventions, and means of avoiding or mitigating these impacts

Construction activities	Potential negative environmental impacts	Means of avoidance or mitigation	General notes	Authorization potentially required in terms of:
Access to the site and to the specific interventions within the site	Soil compaction and disturbance and vegetation disturbance.[1]	As far as possible, use existing roads and tracks. In very wet areas obtain foot access using boards. Rehabilitate access paths when work is complete (e.g. loosen compacted areas).	Must have EMP in RP. Should consider Section 28 of NEMA and section 19 of Water Act	General duty of care, NEMA: If a road is to be built that is wider than 4 metres, GNR 386 item 15.
Storage of materials	Disturbance of vegetation.[1] Visual impact.	Remove all material on completion of the work. Rehabilitate site when work is complete.		NEMA. If >30 cm hazardous substance, GNR 386 item 7. Unlikely
Mixing of concrete	Local contamination of the soil.	Confine mixing of concrete to designated area/s not susceptible to flooding.		
Human waste associated with toilets	Contamination of water.	Locate toilet outside of the wetland.		
Disturbance associated with the noise and presence of many people	Disturbance of fauna, particularly breeding Red Data species.	Consider timing of activities. Screening with shade-cloth, if required.		
Fuel spills or leaks	Contamination of soil and water.	Maintain any machines (e.g. pumps) being used at the site in good working order, and any stored fuel should be located outside of the wetland.		NEMA. If >30 cm hazardous substance. GNR 386 item 7 Unlikely
Temporary diversion channel	Temporary drying out (usually not great, and of a short duration).If not properly rehabilitated, the diversion could become the focus of long term erosion.	Ensure that the diversion channel is fully blocked, in-filled and re-vegetated once work is complete.		NWA: section 21 (c) and (i) and GNR 398
Removal of plugs of vegetation from donor sites	Potential exposure of donor sites to erosion. Disturbance of sensitive areas.	Remove plugs where the threat of erosion is low and the site is not considered sensitive.		
Excavation of soil (for the foundations of structures)	Disturbance of soil and vegetation. Erosion and washing of sediment into downstream habitats[1].	Where the site is located in water flow paths, particularly where discharges are high, confine activity to the dry season. Divert flow until the intervention is well stabilised. Encourage rapid re-vegetation. Exclude livestock until vegetation well established.	Shaping of erosion headcuts subject to high flood discharges often poses the greatest risks.	NEMA: GNR 386 item 4[2] and NWA: section 21 (c) and (i) and GNR 398
Cutting and filling (e.g. in order to slope a gully head or sides)				

Collection of rocks from the local environment	Loss of habitat from rock removal.	Do not collect rocks from a stream channel bed.		
Collection of local sand	Disturbance of vegetation[1], possible increase in risk of erosion.	Collect sand where risk of erosion is low and in areas where pioneer vegetation dominates.		
Use of sand and stone from an outside supplier	Donor sites potentially poorly managed.	Ensure that sand or stones are from an authorized supplier.		

[1] In all cases of disturbance of soil or vegetation, the opportunities for invasive alien species to invade are increased, although the probability of this occurring will vary greatly from site to site.

2 The dredging, excavation, infilling, removal or moving of soil, sand or rock exceeding 5 cubic metres from a river, tidal lagoon, tidal river, lake, in-stream dam, floodplain or wetland.

4 ILLUSTRATION OF A WETLAND REHABILITATION DECISION-MAKING TREE

The following is a working-example of how a decision-making process can be used to determine what authorization is required for a particular wetland-rehabilitation project.

A farmer in Underberg has a few wetlands on his farm that have become damaged through various farming practices that have taken place too close to the boundary of the wetlands. In one wetland a small gully has formed where the cattle drink and another is currently receiving more water than it can cope with, as the farmer is diverting water to irrigate his crops. His long-term goal is to rehabilitate his wetlands so that they revert to the effectively functioning wetlands they originally were. The rehabilitation specialists have conducted a survey and in the plans they specify that the rehabilitation plan will have to include a weir across the stream channel. This activity will require the infilling and/or removal of an excess of five cubic metres of soil. The rehabilitation of the wetlands on the farm will require authorization in terms of the Acts that have been discussed in this document. Figure 5 below, is a decision-tree that shows what legislation and regulations apply to the various aspects of the wetland-rehabilitation project.

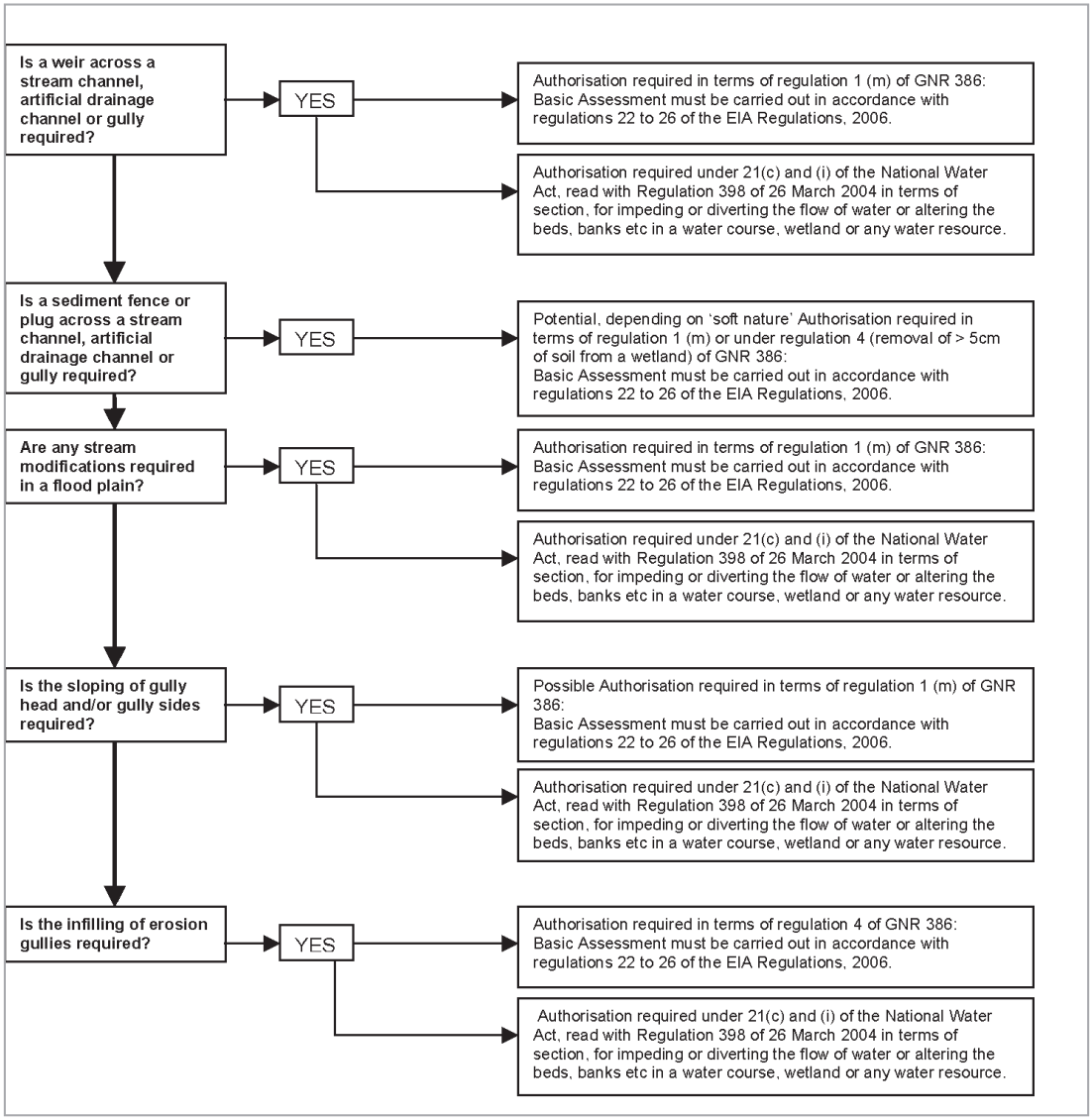

Figure 5: An example of a decision-making process in a wetland rehabilitation project

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