

**Listing Threatened or Protected Ecosystems
in South Africa**

Background Paper

DRAFT for Workshop Participants 24-26 October 2006

South African National Biodiversity Institute

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Contents

1	Introduction	1
2	Suggested purpose and rationale for listing ecosystems	3
2.1	Summary of the purpose	3
2.2	Rationale	3
3	Relevant sections of the Biodiversity Act and other legislation	7
3.1	White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity.....	7
3.2	Biodiversity Act.....	8
3.3	NEMA	12
3.4	NEMA EIA Regulations	13
3.5	Protected Areas Act	13
3.6	National Forests Act.....	14
3.7	National Water Act	15
3.8	Marine Living Resources Act	16
3.9	National Heritage Resources Act.....	16
3.10	Integrated Coastal Management Bill.....	17
3.11	Sustainable Use of Agricultural Resources Bill.....	17
4	Consequences of listing an ecosystem	18
4.1	Environmental authorisation implications.....	18
4.2	Planning related implications	20
4.3	Proactive biodiversity management implications	20
4.4	Implications for restricting threatening processes.....	21
4.5	Monitoring and reporting implications	22
5	How does listing ecosystems relate to listing species?.....	23
6	Overview of experiences from other countries and initiatives	24
6.1	Australia	25
6.2	Australian States and Territories.....	27
6.3	United States of America	27
6.4	Canada (British Columbia).....	28
6.5	European Habitat Directive	29
6.6	United Kingdom.....	30
6.7	Finland.....	30
6.8	South Africa.....	30
6.9	WWF Ecoregions (2004).....	32
6.10	RAMSAR	32
6.11	Important Bird Areas (IBAs)	33
6.12	Important Plant Areas (IPAs)	33
6.13	Key Biodiversity Areas (KBAs).....	33
6.14	IUCN Red List	33

7	Criteria from other countries and initiatives for identifying threatened or protected ecosystems	35
8	Principles that should guide the development of criteria for identifying listed ecosystems in South Africa	36
8.1	Suggested principles	36
8.2	National set of biodiversity features	36
9	Suggested process for identifying and listing ecosystems	38
9.1	What the Biodiversity Act tells us about the process (very little)	38
9.2	Suggested principles / starting points	38
9.3	The need for a phased approach	38
9.4	Suggested steps for developing initial national list	39
9.5	What should go with the list?	39
9.5.1	Descriptions of listed ecosystems?	39
9.5.2	Regulations?	40
9.5.3	Norms and standards for Biodiversity Management Plans	40
9.5.4	Handbook	40
9.6	Communication with landowners and users of listed ecosystems	40
9.7	Enforcement	41
9.8	Reviewing the list	41
9.9	Monitoring listed ecosystems	41
10	Other issues that need to be addressed	42
10.1	Mapping issues	42
10.1.1	Must every listed ecosystem be mapped?	42
10.1.2	What are the spatial scale parameters and other guidelines for mapping ecosystems?	42
10.1.3	Should the original extent or the remaining extent of an ecosystem be mapped?	42
10.2	What attribute information should be required?	43
10.3	Should threatening processes be identified for every listed ecosystem?	43
10.4	What is the link between listed ecosystems and critical biodiversity areas identified in a published bioregional plan?	44
	Appendix A: Sections of the Biodiversity Act that deal directly or indirectly with listed ecosystems	45
	Appendix B: Relevant sections of NEMA (as amended)	52

1 Introduction

The National Environmental Management: Biodiversity Act (Act 10 of 2004) (hereafter Biodiversity Act) provides for listing threatened or protected ecosystems. The Department of Environment Affairs and Tourism (DEAT) has requested the South African National Biodiversity Institute (SANBI) to assist with the process of identifying and listing threatened or protected ecosystems.

The Biodiversity Act defines an ecosystem as a dynamic complex of animal, plant and micro-organism communities and their non-living environment interacting as a functional unit.

DEAT's approach to the process of listing ecosystems is broadly the following:

- **Develop criteria** for identifying threatened or protected ecosystems (September – December 2006)
- **Identify** threatened or protected ecosystems, probably taking a phased approach (discussed further in Section 9, timeframe to be determined)
- **List** threatened or protected ecosystems (timeframe to be determined)

The purpose of this paper is to provide background information for participants at the national workshop on the development of criteria for identifying threatened and protected ecosystems, to be held at SANBI's Biodiversity Centre in Pretoria on 24-26 October 2006. Further, it is hoped that the paper will be a useful resource for all those involved in the process of identifying and listing threatened or protected ecosystems, as it unfolds.

Valuable discussions with a range of people in DEAT, SANBI and other organisations have fed into the content of the paper – thanks to all those involved. **Please note that this paper is a DRAFT, intended to stimulate thought and further discussion and certainly not to be prescriptive.** Comments, thoughts and any factual corrections or additions are very welcome. Please send them to Mandy Driver (driver@sanbi.org) and Tammy Smith (smitht@sanbi.org).

The paper aims to:

- Establish the purpose and rationale for listing threatened or protected ecosystems (Section 2)
- Introduce relevant aspects of the Biodiversity Act and other relevant legislation (Section 3)
- Clarify the consequences of listing an ecosystem in terms of existing legislation (Section 4)
- Clarify the relationship between listing threatened or protected species and listing threatened or protected ecosystems (Section 5)
- Review significant lessons from other countries and initiatives (Section 6)
- Review criteria used to identify listed ecosystems (or similar) in other countries and other international initiatives (Section 7)
- Suggest principles that should guide the development of criteria for identifying threatened or protected ecosystems in South Africa (Section 8)
- Suggest a process for identifying and listing threatened and protected ecosystems in South Africa (Section 9)
- Set out important issues that still need to be addressed (Section 10)

2 Suggested purpose and rationale for listing ecosystems

2.1 Summary of the purpose

The purpose of listing *threatened ecosystems* is primarily **to reduce the rate of ecosystem and species extinction**. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing *protected ecosystems* is primarily **to preserve witness sites of irreplaceable natural habitat**. For both threatened and protected ecosystems, the purpose includes enabling or facilitating proactive management of these ecosystems.

In addition, listing ecosystems is likely to play a symbolic and awareness-raising role; however, this is not the primary purpose of listing ecosystems.

The purpose of listing threatened or protected ecosystems is NOT to:

Ensure the persistence of *landscape-scale* ecological processes

Ensure the provision of ecosystem services

Listing ecosystems may contribute towards these important goals, but they are not the purpose of listing ecosystems.

2.2 Rationale

In order to conserve biodiversity effectively, we need to:

- Conserve a **representative sample** of all components of biodiversity (genes, species, ecosystems) – the principle of representation
- Ensure the continued functioning of **ecological and evolutionary processes** that allow biodiversity to persist over time – the principle of persistence

Systematic biodiversity planning has developed as a spatial planning approach that identifies geographic **priority areas** required in order to achieve representation and persistence.

Broadly speaking, there are two main strategies for ensuring that these geographic priority areas remain in a well managed natural state:

- Strategy 1: Consolidation and expansion of the protected area network
- Strategy 2: Integrated management aimed at conservation of aquatic and terrestrial ecosystems in priority areas outside the protected area network

The protected area network, for various historical reasons, is biased towards certain ecosystems (such as savanna and fynbos mountain ecosystems) and does a poor job of protecting other ecosystems (such as succulent karoo, grasslands, fynbos lowlands, Nama karoo, almost all inland water ecosystems (including estuaries), and offshore marine ecosystems).

This makes the second strategy all the more important for ecosystems that are poorly protected by the protected area network. These tend to be ecosystems that occur in production landscapes where options for formal protection through the protected area network are reduced. Yet, as the White Paper on the Conservation and Sustainable Use of South Africa's Biodiversity notes, little attention has historically been paid to the protection of ecosystems outside protected areas (see Section 3.1).

In response to this historical lack of attention, the Biodiversity Act introduced several new tools or mechanisms for achieving integrated management for conservation of aquatic and terrestrial ecosystems outside the protected area network. Listing threatened or protected ecosystems is ONE of these tools. Others include:

- Publishing bioregional plans
- Listing threatened or protected species and accompanying regulations
- Biodiversity management plans for ecosystems or species
- Invasive alien species regulations
- Norms and standards for regulation of the hunting industry

Published bioregional plans should identify *all* priority areas required for meeting the conservation objectives of representation and persistence. These priority areas, collectively referred to as **critical biodiversity areas**, should include landscape-scale ecological corridors and important catchments.¹ Threatened or protected ecosystems, on the other hand, are likely to be a subset of these priority areas. Listing of ecosystems should focus attention on prevention of loss of natural habitat, appropriate management and emergency action in priority areas at the local or site level. (Also see Section 10.4)

Aside from tools in the Biodiversity Act, other legislation provides further mechanisms that can contribute to conservation of priority areas outside the protected area network. These include, for example:

- Land-use planning
- Environmental assessment requirements
- Resource directed measures for water resources

Clear identification of priority areas for biodiversity conservation, including critical biodiversity areas in published bioregional plans and listed threatened or protected ecosystems, can support the effective application of these more general planning and management tools.

To repeat: listing threatened or protected ecosystems is one of a number of tools for conserving biodiversity – we can't expect listing of ecosystems to achieve all our conservation objectives. This may seem an obvious point, but we need to have it firmly in mind in the development of criteria for identifying listed ecosystems.

Figure 1 summarises this rationale and shows where listed ecosystems fit in to the suite of tools for achieving conservation objectives.

¹ Norms and standards for publishing bioregional plans are currently being finalised and will be available shortly.

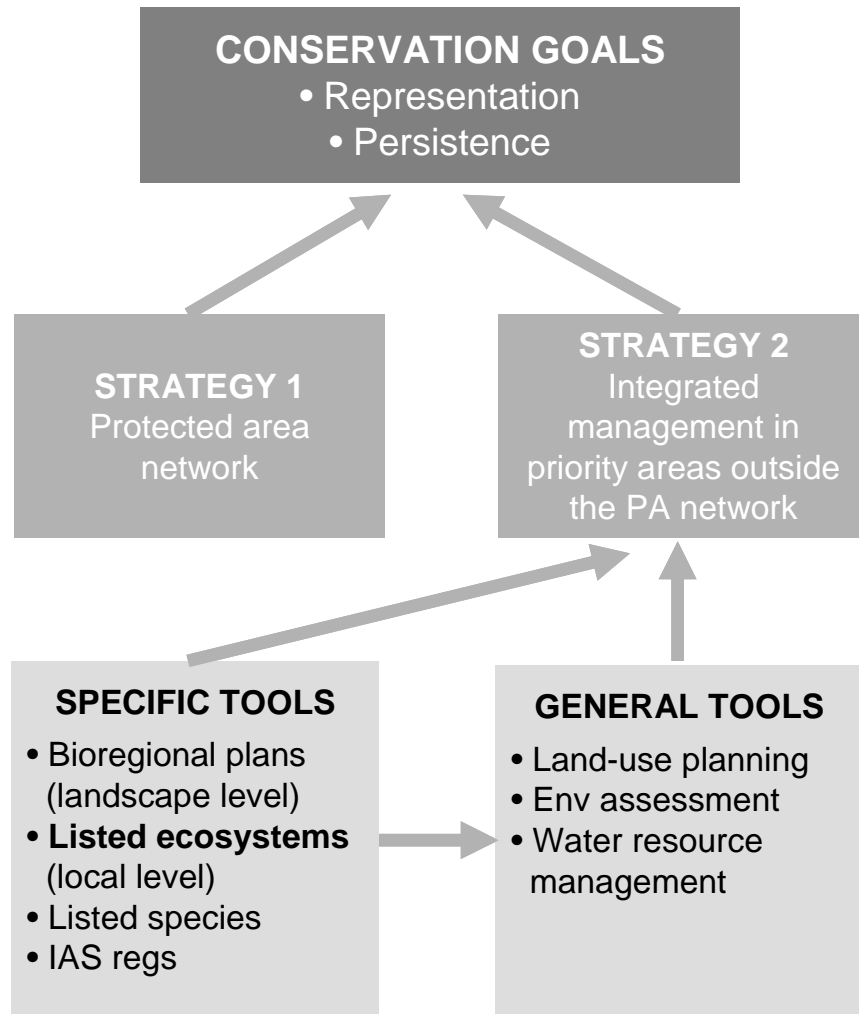


Figure 1: Summary of the rationale for listing threatened or protected ecosystems as one of several tools for conserving biodiversity

3 Relevant sections of the Biodiversity Act and other legislation

The Biodiversity Act establishes the framework for listing threatened or protected ecosystems, drawing on policy objectives established in the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity. Several other pieces of legislation have direct or indirect links with the Biodiversity Act's provisions on listed ecosystems. This section briefly summarises the relevant sections of the White Paper, the Biodiversity Act and other relevant legislation.

Legislation with direct links to listed ecosystems includes:

- National Environmental Management Act (Act 107 of 1998, amended 2002 and 2004) (NEMA)
- NEMA Regulations on Environmental Impact Assessment (EIA Regulations)

Legislation with indirect links includes:

- National Environmental Management: Protected Areas Act (Act 57 of 2003)
- National Forests Act (Act 84 of 1998)
- National Water Act (Act 36 of 1998)
- Marine Living Resources Act (Act 18 of 1998)
- National Heritage Resources Act (Act 25 of 1999)
- Integrated Coastal Management Bill
- Sustainable Use of Agricultural Resources Bill

3.1 White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity

The Biodiversity Act was preceded by the White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity (May 1997), which sets the scene for listing threatened or protected ecosystems even though it does not refer to them directly. Policy Objective 1.2 is especially relevant: Maintain and strengthen existing arrangements to conserve South Africa's indigenous biodiversity, both inside and outside of protected areas.

In the discussion of this policy objective, the White Paper notes: “South Africa has a substantial body of law to conserve biodiversity, especially within protected areas and for several plant and vertebrate species. *However, past approaches to biodiversity conservation have not given adequate attention to the conservation of landscapes and ecosystems outside of protected areas...*” (italics added).

The White Paper commits government to achieving Policy Objective 1.2 through collaborating with interested and affected parties to:

Conserve important components of biodiversity through a variety of mechanisms such as legislation, planning controls, guidelines, and protected area designations, giving priority to components of biodiversity requiring urgent protective measures;

c. *Introduce legal measures and incentives to conserve important ecosystems, habitats, and landscapes outside of protected areas*, including rangelands and their associated vegetation and indigenous wildlife resources;

According to the White Paper, important components of biodiversity include ecosystems and habitats that:

- contain high diversity;
- contain large numbers of endemic or threatened species;
- are relatively pristine;
- are important nursery or spawning areas;
- are under particular threat;
- are important for endangered or migratory species;
- adjoin conserved ecosystems and habitats;
- are of social, economic, cultural or scientific importance;
- are unique, representative of or associated with key evolutionary, biological or other life-supporting processes.

3.2 Biodiversity Act

The full text of the relevant sections of the Biodiversity Act is available in Appendix A.

Sections 52 to 55 of the Biodiversity Act deal directly with **listing threatened or protected ecosystems**. The Minister may publish a national list of ecosystems that are threatened and in need of protection, and an MEC may publish a provincial list of such ecosystems with the concurrence of the Minister.

The following categories of ecosystems may be listed:

- **critically endangered ecosystems**, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;
- **endangered ecosystems**, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;
- **vulnerable ecosystems**, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and
- **protected ecosystems**, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed in terms of paragraphs (a), (b) or (c).

According to the Act, the list of ecosystems **must describe in sufficient detail the location of each ecosystem on the list**. This suggests that the ecosystems should be mapped, but does not necessarily require a map of every ecosystem. However, some of the consequences of listing an ecosystem, discussed in Section 4, rely in practice on having a map of the ecosystem. In particular, a listed ecosystem must be regarded as an area identified for the purpose of section 24(2)(b) of NEMA – this is difficult without a map of the ecosystem.

The Minister (or MEC) must **review** the published list of ecosystems at least **every five years**.

The Minister may identify any process or activity in a listed ecosystem as a **threatening process**. Such a threatening process must be regarded as a specified activity contemplated in section 24(2)(b) of NEMA (see Section 3.3).

An organ of state that must prepare an environmental implementation or environmental management plan (EIP or EMP) in terms of Chapter 3 of NEMA (all national departments and provinces), and a municipality that must adopt an integrated development plan (IDP) in terms of the Municipal Systems Act (Act 32 of 2000), must take into account the need for the protection of listed ecosystems.

Sections 43 to 46 of the Biodiversity Act deal with **biodiversity management plans** and **biodiversity management agreements**.

Any person, organisation or organ of state can develop a draft biodiversity management plan and submit it to the Minister for approval, for:

a listed ecosystem

an ecosystem which is not listed but which does warrant special conservation attention

Biodiversity management plans can also be developed for species.

Before approving and publishing a draft biodiversity management plan, the Minister must identify a suitable person, organisation or organ of state willing to be responsible for the implementation of the plan, determine the manner of implementation of the plan, and assign responsibility for the implementation of the plan to the identified person, organisation or organ of state.

The Minister may enter into a biodiversity management agreement with the identified person, organisation or organ of state, or any other suitable person, organisation or organ of state, regarding the implementation of a biodiversity management plan.

A biodiversity management plan must be aimed at ensuring the long-term survival in nature of the species or ecosystem to which the plan relates, and must provide for the responsible person, organisation or organ of state to monitor and report on progress with implementation of the plan.

The Minister must review a published biodiversity management plan at least every five years, and assess compliance with the plan and the extent to which its objectives are being met.

Section 97 deals with **regulations**. The Minister may make regulations relating to minimising the threat to the ecological integrity of a listed ecosystem. Presumably such regulations could also apply to a group or category of listed ecosystems.

The Minister may also make regulations relating to the monitoring of compliance with and enforcement of norms and standards referred to in section 9 (see below).

Section 9 deals with **norms and standards**. The Minister may issue norms and standards for the achievement of any of the objectives of the Act, including restriction of activities which impact on biodiversity and its components. Norms and standards may apply nationwide, in a specific area only, or to a specific category of biodiversity only. The Minister may set indicators to measure compliance with the norms and standards.

Sections 99 and 100 deal with **consultation and public participation**. Before exercising the powers discussed above, the Minister must consult all Cabinet members whose areas of responsibility may be affected, consult the MEC for Environmental Affairs of each province that may be affected, and allow for public participation.

Public participation requirements are as follows: The Minister must give notice of the proposed exercise of the power in the Gazette, and in at least one newspaper distributed nationally or distributed in a particular area if only that area is affected. The notice must invite members of the public to submit written representations on, or objections to, the proposed exercise of the power within 30 days, and must contain sufficient information to enable members of the public to submit meaningful representations or objections. The Minister may in appropriate circumstances allow oral representations or objections. The Minister must give due consideration to all representations or objections received or presented before exercising the power.

Section 11 deals with the **functions of SANBI**, which include monitoring and reporting regularly to the Minister on the conservation status of all listed species and listed ecosystems.

Section 49 deals with **monitoring** the status of biodiversity in the country. The Minister must designate monitoring mechanisms and set indicators to determine the conservation status of various components of South Africa's biodiversity, as well as any negative and positive trends affecting their conservation status. The Minister must report annually to parliament on these indicators and make the information publicly available.

3.3 NEMA

Section 24 of NEMA (1998) deals with environmental authorisations, and was amended quite extensively in 2004. Section 24(2) allows the Minister or MEC to **identify geographical areas based on environmental attributes in which specified activities may not commence without environmental authorisation** from the competent authority, and geographical areas based on environmental attributes in which specified activities do not require authorisation by the competent authority. The Minister or MEC may compile information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority. An MEC can also identify activities that require environmental authorisation over and above those on the national list.

Before identifying an activity or area in terms of section 24(2), the Minister or MEC must publish a notice in the Gazette:

- specifying, through description, a map or any other appropriate manner, the activity or area that it is proposing to list
- inviting interested parties to submit written comments on the proposed listing within a specified period
- giving the competent authorities and the date on which the list comes into effect

3.4 NEMA EIA Regulations

The new EIA Regulations (R385) were published in April 2006 and took effect on 1 July 2006. They are intended to streamline the environmental authorisation process and make it less burdensome on developers and competent authorities (usually provincial environment affairs departments on behalf of MECs for the environment).

The new EIA regs include two lists of activities:

- Activities that require a basic assessment – quick and easy (R386)
- Activities that require scoping and EIA – more onerous (R387)

The basic assessment process is described in Sections 22-26 of R385. The scoping and EIA process is described in Sections 27-36. Activities listed in terms of S24D of NEMA trigger a basic assessment unless the Minister specifies that they should trigger scoping and EIA (S21).

The EIA regs also provide for national and provincial guidelines on the implementation of the regulations (S73-76), and for Environmental Management Frameworks (S69-72).

3.5 Protected Areas Act

The Protected Areas Act (2003) defines three main categories of protected areas:

- Special nature reserves (can be declared only by the Minister)
- Nature reserves (can be declared by the Minister or MEC)
- Protected environments (can be declared by the Minister or MEC)

World heritage sites are considered separately from these three categories.

Any of the three categories of protected area can be declared on privately owned land, at the request or with the consent of the landowner(s).

Protected ecosystems in terms of the Biodiversity Act are NOT intended to be equivalent to any of these categories. Listing of ecosystems is intended to complement the

Protected Areas Act. **There is no substitutability between the protected area categories and the listing categories.**

However, there seems to be potential overlap between the rationale for declaration of protected environments and listing threatened ecosystems. A protected environment can be declared “to protect the area if the area is sensitive to development” or “to protect a specific ecosystem outside a special nature reserve, world heritage site or nature reserve” (S28(2)).

In some cases, **listed ecosystems may occur inside protected areas**. It is important from the point of view of developing protected area management plans to know if there are ecosystems inside protected areas that require particular attention, so that these ecosystems can be appropriately managed.

Note that marine protected areas are declared in terms of the Marine Living Resources Act (see Section 3.8).

3.6 National Forests Act

In terms of the National Forest Act (1998), trees in all indigenous forests are protected, and some indigenous forests are declared specially protected forest areas.

Chapter 3 of the National Forests Act deals with special measures to protect forests and trees.

- Part 1 (S7) **prohibits the destruction of indigenous trees in any natural forest** without a licence. The Minister can declare a group of indigenous trees to be a forest even if their crowns are not largely contiguous, based on scientific advice that the trees make up a forest.
- Part 2 (S8-11) allows the Minister to declare certain forests **specially protected forest areas**.
 - A state forest or part of it can be declared a specially protected forest area
 - Land can be purchased or expropriated and declared a specially protected forest area

- At the request of or with the consent of a landowner outside a state forest, the Minister can declare a specially protected forest area.
- Specially protected forest areas must fall into in one of the following categories: forest nature reserve, forest wilderness area, any other type of protected area which is recognised in international law or practice
- Part 3 (S12-16) allows the Minister to declare a tree, a group of trees, a woodland, or a species of tree as protected
- Part 4 (S17-18) gives the Minister powers to intervene urgently to prevent deforestation and to rehabilitate deforested areas

The process of declaring a specially protected forest area, a protected woodland or a protected group of trees is considerably more onerous than the process of listing a threatened or protected ecosystem. There is potential for the Biodiversity Act to complement the National Forests Act in this regard.

3.7 National Water Act

The National Water Act (1998) defines a water resource as a watercourse (including wetlands), surface water, estuary or aquifer. The Act places strong emphasis on sustainable use of water resources, and its purpose includes “protecting aquatic and associated ecosystems and their biological diversity” (S2(g)).

Chapter 3 deals with protection of water resources, and establishes a series of measures for achieving this, including:

- A classification system for water resources (Part 1, S12)
- Resource quality objectives, which depend on the class of the water resource (Part 2, S13-15)
- The Reserve (Part 3, S16-18). The ecological reserve is the water required to protect the aquatic ecosystems of the water resource, and varies depending on the class of the water resource.

The implementation of the National Water Act is supported by the National Water Resource Strategy. It includes the establishment of Catchment Management Agencies and the development of Catchment Management Strategies.

The listing of threatened or protected inland water ecosystems should complement the objectives of the National Water Act by highlighting aquatic ecosystems that require special attention from an ecological point of view. Listed inland water ecosystems should feed into the development of Catchment Management Strategies.

3.8 Marine Living Resources Act

Chapter 4 (S43) of the Marine Living Resources Act (1998) allows for the declaration of marine protected areas. Other spatial tools in the Act include the declaration of fisheries management areas (S15), priority fishing areas (S17) and subsistence fishing zones (S19).

As with terrestrial protected areas declared in terms of the Protected Areas Act, it seems that marine protected areas and listed marine ecosystems would complement each other. Also as with terrestrial protected areas, a listed marine ecosystem could occur within a marine protected area, highlighting the need for appropriate management of the ecosystem within the protected area.

3.9 National Heritage Resources Act

According to the National Heritage Resources Act (1999), the national heritage estate may include “landscapes and natural features of cultural significance” (S3). There are three grades of heritage resources, corresponding more or less to heritage resources of national, provincial and local significance (S7). Chapter 11 of the Act allows for the declaration of national and provincial heritage sites (S27), protected areas surrounding national or provincial heritage sites (S28), and heritage areas in town and regional planning schemes or other spatial plans (S31). An inventory of the national heritage estate must be compiled (S39); however, maps of spatial heritage resources do not seem to be required as part of this inventory.

We may wish to explore potential links between listed protected ecosystems in terms of the Biodiversity Act, and heritage sites, protected areas and heritage areas identified in terms of the National Heritage Resources Act.

3.10 Integrated Coastal Management Bill

- Part of the National Environmental Management suite of legislation
- Most recent version does not seem to be available but apparently soon to go to Parliament

3.11 Sustainable Use of Agricultural Resources Bill

- Will replace the Conservation of Agricultural Resources Act (CARA)
- Not available yet but apparently soon to be finalised
- National Policy on the Preservation of High Potential and Unique Agricultural Land published in June 2006 – links to SUAR not the CARA
- Are there opportunities for collaborating with the Department of Agriculture? It may be important to make an explicit spatial comparison between listed ecosystems and areas identified as high potential or unique agricultural land, and to have a focused engagement with the Department of Agriculture on this issue.

4 Consequences of listing an ecosystem

This section outlines the consequences or implications of listing an ecosystem. Understanding the consequences should help us to determine appropriate criteria for identifying threatened or protected ecosystems.

In terms of existing legislation, consequences of listing an ecosystem include:

- Environmental authorisation implications
- Urban and regional planning implications
- Proactive biodiversity management implications
- Implications for restricting threatening processes
- Monitoring and reporting implications

4.1 Environmental authorisation implications

- In terms of S53(2) of the Biodiversity Act, **a listed ecosystem is identified as a geographical area in terms of NEMA s24(2)**. It seems the area must be published in terms of NEMA S24D (an amendment to NEMA) as well as in terms of the Biodiversity Act.
- Also in terms of S53(2) of the Biodiversity Act, **a threatening process in a listed ecosystem becomes a specified activity in terms of NEMA 24(2)**. Again, it seems the activity must be published in terms of NEMA s24D as well as in terms of the Biodiversity Act.
- NEMA S24(2) allows for provincial EIA supplementation maps which identify
 - sensitive areas and additional activities that should trigger environmental authorisations in those areas
 - “exclusion areas” where environmental authorisations should not be required.Some provinces have developed / are developing EIA supplementation maps. **Listed ecosystems should be included in EIA supplementation maps** when these are developed.

- The new EIA regs include two lists of activities:
 - Activities that require a basic assessment (R386)
 - Activities that require scoping and EIA (R387)

Terrestrial ecosystems and wetlands and riparian zones

- Activity 12 in R386 is: the **transformation or removal of indigenous vegetation** of 3 hectares or more OR OF ANY SIZE if the transformation or removal would occur within a critically endangered or endangered ecosystem listed in terms of the Biodiversity Act. In other words the **3 hectare threshold falls away in a CR or EN ecosystem.**

The table below summarises the implications of transformation or removal of indigenous vegetation in terms of the EIA regulations:

	CR or EN ecosystem, or geographic area for this purpose	Other areas
Impact >20ha	Full scoping & EIA	Full Scoping & EIA
20>impact >3ha	Basic Assessment Report	Basic Assessment Report
Impact <3ha	Basic Assessment Report	No EIA requirements

Wetlands

- The EIA regulations do not protect wetlands strongly, so the ecosystem listing process represents an important opportunity for triggering environmental authorisations for activities that impact on wetlands.
- Activity 4 in R386 is: “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.” This is the only direct reference to wetlands in the regulations (although there are indirect references, for example to the extraction of peat).
- Specifically, the process of listing ecosystems allows for including buffers around wetlands and triggering environmental authorisations in these.

Rivers

- Activity 1 in R386 includes: The construction of facilities or infrastructure, including associated structures of infrastructure, for:
 - (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 canals, channels, bridges, dams and weirs
 - (n) the off-stream storage of water, including dams and reservoirs, with a capacity of 50 000 cubic metres or more (unless the activity falls under R387).
- Opportunity to strengthen through listing river ecosystems, including widening the river buffer beyond 32m where appropriate.

Coast

- R386 includes just about any activity within 100m inland of the high water mark. May want to use ecosystem listing to extend this further inland in some cases.

Environmental Management Frameworks

- Listed ecosystems should feed into the development of Environmental Management Frameworks in terms of the EIA regulations.

4.2 Planning related implications

In terms of the Biodiversity Act:

- Listed ecosystems must be taken into account in IDPs, and by implication in SDFs
- Listed ecosystems must be taken into account in EIPs and EMPs required in terms of Chapter 3 of NEMA

We will need to give guidance on how listed ecosystems should be taken into account in these planning tools (see Section 9.5.4 on proposed handbook to accompany list of ecosystems).

4.3 Proactive biodiversity management implications

Listing of ecosystems allows for considerable focus of proactive management actions on these ecosystems to protect or rehabilitate them.

In terms of the Biodiversity Act:

- A Biodiversity Management Plan can be developed for a listed ecosystem and published. The Minister must identify an implementing agent for the management plan in order for it to be published, and must assess implementation of the plan every five years. Presumably Biodiversity Management Plan could also be developed for a group of listed ecosystems.
- The Minister can enter into a Biodiversity Management Agreement with the implementing agent of a Biodiversity Management Plan.

Other proactive management actions that could be applied to listed ecosystems include the following:

- Regulation and control of invasive alien species could be prioritised in listed ecosystems
- Rehabilitation programmes such as Working for Wetlands could prioritise listed ecosystems
- Protected area expansion strategies and plans could aim to incorporate some listed ecosystems in protected areas

4.4 Implications for restricting threatening processes

In terms of the Biodiversity Act:

- The Minister may develop regulations for minimising the threat to the ecological integrity of a listed ecosystem.
- The Minister may develop norms and standards for the restriction of activities that impact on listed ecosystems. These norms and standards can apply to a particular listed ecosystem, to a category of listed ecosystems, or to all listed ecosystems.

This is potentially powerful tool for restricting further loss of natural habitat in threatened ecosystems. However, we suggest that it is important to firmly establish the system for identifying and listing ecosystems before additional regulations are applied to these

ecosystems. Enforcement of such regulations would need to be carefully considered and planned for.

4.5 Monitoring and reporting implications

As discussed in Section 3.2, SANBI must monitor and report regularly to the Minister on the conservation status of all listed threatened or protected species and listed ecosystems. In addition, the Minister must designate monitoring mechanisms and set indicators to determine the conservation status of the various components of South Africa's biodiversity, and any negative and positive trends affecting their conservation status.

This means we need to think about mechanisms for monitoring and reporting on listed ecosystems. These should be linked to the national biodiversity monitoring and reporting framework currently being developed by SANBI. The national framework should include a requirement for provinces to report on loss and degradation of habitat in listed ecosystems. DWAF and the River Health Programme will need to be closely involved in monitoring listed inland water ecosystems.

It would also be useful to monitor the effectiveness of interventions intended to protect listed ecosystems – how much is spent on such interventions and with what impact?

5 How does listing ecosystems relate to listing species?

The Biodiversity Act provides for listing threatened or protected species, as well as threatened or protected ecosystems. Draft regulations for listing threatened or protected species, and draft species lists, have been developed and are in the process of being finalised.

Only species threatened by restricted activities as defined in the Biodiversity Act have been included in the lists of threatened or protected species. The Biodiversity Act defines restricted activities as: hunting, catching, capturing or killing any living specimen; gathering, collecting or plucking any specimen; picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen; importing or exporting any specimen; having in possession or exercising physical control over any specimen; growing, breeding or in any other way propagating any specimen or causing it to multiply; conveying, moving or otherwise translocating any specimen; selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen.

This list of restricted activities does not include destroying the habitat of a species, which is the main driver of loss of terrestrial species. Many species are threatened only by habitat loss; these species will not be listed in terms of the Biodiversity Act. There is an expectation amongst many stakeholders in the biodiversity sector that species threatened by habitat loss will be “picked up” in the ecosystem listing process.

This means that **it is important to consider species-related criteria in the development of criteria for identifying threatened or protected ecosystems.**

However, it will not be possible to protect all species threatened by habitat loss via the ecosystem listing process, partly because knowledge of the locations of these species is incomplete.

6 Overview of experiences from other countries and initiatives

Most countries have not attempted to list threatened or protected ecosystems through legislation – this is relatively new ground. Nevertheless, several countries and international initiatives provide us with potential useful lessons:

- Australia and the US are the only countries that have used the concept of threatened ecosystems (or similar) with the same intent as South Africa. In Australia, any one of a range of criteria qualifies an ecological community as threatened, while in the US a multi-criteria approach is used.
- Canada, the UK, Denmark and Finland have programmes or initiatives that are related in some way.
- International initiatives that may provide useful lessons are the European Habitat Directive, WWF Ecoregions, Ramsar, Important Bird Areas, Important Plant Areas, Key Biodiversity Areas, and the IUCN Red List.

The experiences of these countries and other initiatives are reviewed below. A review of the South African experience to date is included. Section 7 gives a table of the criteria used to identify threatened or protected ecosystems (or similar) in these countries/initiatives.

Some of the key points that emerge are:

- Many of the initiatives don't consider threatened ecosystems but only look at sites important for biodiversity/conservation.
- Disagreement regarding definition of what constitutes an ecological community/ecosystem.
- Majority consider terrestrial environments only and have not yet attempted criteria for aquatic or marine environments.
- Criteria must be scientifically credible, practical, and simple.
- Thresholds are generally indicative and can only be applied to better know ecosystems. Different thresholds may be required for different environments.

- The most appropriate scale for mapping an ecosystem depends on the specific ecosystem and the available data.
- Defining appropriate time frames, relevant to criteria, is difficult for ecosystems.
- Listing of areas that are degraded within a threatened ecosystem is not always appropriate.
- A strategic approach is needed for the assessment of ecosystems to identify those that are a high priority for listing.

6.1 Australia

- The Australian Government (Department of Environment and Heritage) has an Environment Protection and Biodiversity Conservation Act (1999) and Environmental Protection and Biodiversity Conservation Regulations (2000).
- The act provides for the listing of threatened and ecological communities and the accompanying regulations provide a set of criteria for identification of these threatened ecological communities.
- An ecological community is defined as a 'unique and naturally occurring group of plants or animals, whose presence can be determined by factors such as soil type, position in the landscape, climate and water availability'.
- Three categories for nominating an ecological community as threatened under the EPBC Act:
 - Critically Endangered: an ecological community that is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
 - Endangered: an ecological community that is not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
 - Vulnerable: an ecological community that is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- Six criteria have been developed.
- Meeting only one of these criteria qualifies an ecological community for listing.
- EPBC Act also provides for listing of threatened species, listing of threatening processes and recovery plans for listed threatened species and ecological communities.
- EPBC Act also allows for listing of critical habitats.
- This is habitat critical to the survival of listed threatened species or threatened ecological community and is recorded in a register of critical habitats.
- Register has a description which must identify habitat, including location and extent, and reasons why it was identified as critical habitat.
- Only the Minister can identify critical habitat, no provision in the Act for public nomination.

Scale

- For terrestrial communities usually 1:100 000 but can use 1:250 000 (wide spread communities) and 1:50 000 for (communities with restricted distributions).

Environment

- Terrestrial and some aquatic (e.g. wetlands, swamps, communities dependent on groundwater discharge).

Process of listing an ecological community

- Any person may nominate an ecological community for listing to the Minister. Nomination forms and a set of guidelines are available.
- The conservation status of the community is assessed by the Threatened Species Scientific Committee (TSSC), a scientific body appointed under the EPBC Act to provide independent advice to the Minister.
- The TSSC has developed a framework to ensure a rigorous scientific and strategic approach to assessing ecological communities on a national level, using the national Vegetation Information System where ecological communities can be identified under one of the Major Vegetation Subgroups (MVS).
- A workshop with relevant experts is held to define and describe the nominated ecological community.
- The TSSC has 12 months to make an assessment of the nominated ecological community.
- During the assessment phase the nomination is subject to a two month public consultation phase.
- Recommendations from the TSSC are forwarded to the Minister, who makes the final decision as to whether an ecological community should be listed. The Minister has 90 days to make this decision.
- Once an ecologically community is listed as threatened its recovery is assisted using conservation advice provided by the TSSC and the development of a Recovery Plan.
- The process of listing has been slow and although many ecological communities meet the criteria only 36 have been approved.
- For example the Australian Terrestrial Biodiversity Assessment (2002) identified 2891 threatened ecosystems (ecological communities), using national classification of Major Vegetation Subgroups of the National Vegetation Information System and the criteria developed for the EPBC Act.
- In 2005 a new approach was developed to improve the clarity of definitions taking into account the impact of degradation and regional variation in widespread ecological communities.
- This new approach uses conditional classes to describe areas of an ecological community that have a similar conservation status. Only areas of vegetation in good condition will be listed while significantly degraded areas will not be listed.
- These significantly degraded areas are not unimportant and fall under a second conditional class that represents areas that would respond to rehabilitation efforts. Land managers can apply for funding to improve the condition of this land.
- The thresholds for these conditional classes are identified at the expert workshop.
- The definition of an ecological community can often be regionalised with the definition of the listed ecological community differing slightly for each region.

6.2 Australian States and Territories

- Often have own legislation including identifying threatened ecological communities using own criteria.
- For example Western Australia (Department of Environment and Conservation) Defines an ecological community as 'a naturally occurring biological assemblage that occurs in a particular type of habitat'.
Four categories of threatened ecological communities
 - presumed totally destroyed
 - critically endangered
 - endangered
 - vulnerable
- Ecological community that are not threatened can be added to a Priority Ecological Community List either as:
Priority 1, 2 or 3 (poorly-known ecological communities but possibly threatened)
Priority 4 (ecological communities that are adequately known, are rare but not threatened, meet criteria for near threatened, or have been recently removed from the threatened list). These communities require regular monitoring.
Priority 5 (conservation dependent ecological communities).

Scale

- Not specified.
- Scale at which defined depends on level of detail in information source.

Environment

Mainly terrestrial but do include swamps, wetlands and freshwater lake communities.

6.3 United States of America

National Biological Services

- Noss, LaRoe & Scott (1995) did a preliminary assessment of loss and degradation of natural ecosystems and listed them under three categories:
 - Critically endangered (30 ecosystems)
 - Endangered (58 ecosystems)
 - Threatened (>38 ecosystems).
- Determined by literature review and survey of conservation agencies and professionals as a systematic approach at a national level was not possible. Therefore crude and data highly variable.
- Ecosystems were generally defined and included vegetation types, plant associations, natural communities and habitats defined by floristics, structure, age, geography, condition and other ecologically relevant facts.

Scale

Various scales because of methodology used.

Environment

Terrestrial (mainly) but some wetlands, aquatic, estuarine and marine habitats included.

Defenders of Wildlife

- Noss & Peters (1995) identified the top 21 endangered ecosystem in the USA.
- Used a multi-criteria approach, based on rough calculations of extent of decline, rarity, imminence of threat and numbers of federally listed species.
- Ranked criteria for each ecosystem.
- Ecosystem defined as a 'characteristic community of interdependent plants, animals and microorganisms associated with particular kinds of soil, temperature, rain fall and disturbance patterns'.

Scale

- Broad e.g. grassland type, forest type etc.
- Must all be able to be measured and mapped.

Environment

Terrestrial (includes wetlands).

The Nature Conservancy

- Base criteria on rarity, particularly at a species level.
- Use global ranking criteria.

Scale

- Global.

Environment

- Terrestrial.

6.4 Canada (British Columbia)

- Based on the Heritage Conservation Status Assessment Factors (Master, Morse, Weakly, Hammerson & Faber-Langendoen, 2002).
- Use Red (endangered and threatened) and Blue (of special concern) Lists to assess the conservation status of species and ecological communities.
- Ecological community defined as an 'assemblages of species that co-occur in defined areas at certain times and have the potential to interact with each other'.
- Criteria used to assess conservation status of ecological communities include:
 - range extent
 - area of occupancy
 - long-term trend
 - short-term trend

- threats (severity, scope & immediacy)
- number of protected and managed occurrences
- intrinsic vulnerability
- environmental specificity
- number of occurrences and number of occurrences with good viability.
- British Columbia also has a Sensitive Ecosystem Inventory (SEI) to identify and map remnants of rare and fragile terrestrial ecosystems (a portion of landscape with relatively uniform vegetation). The information is derived from aerial photography and selective ground truthing. Ecosystem types identified vary from region to region but usually include forest ecosystems, woodlands, wetlands, riparian areas and natural meadows and grasslands.

6.5 European Habitat Directive

- The aim of this Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements.
- The Directive recognises that natural habitats are continuing to deteriorate and an increasing number of wild species are seriously threatened, that threatened habitats and species form part of the Community's natural heritage, and the threats to them are often transboundary and it is therefore necessary to take measures at Community (EU) level in order to conserve them.
- A natural habitat type of Community interest means those which:
 - are in danger of disappearance in their natural range; or
 - have a small natural range following their regression or by reason of their intrinsically restricted area; or
 - present outstanding examples of typical characteristics of one or more of the six following biogeographical regions: Alpine, Atlantic, Boreal, Continental, Macaronesian and Mediterranean.
- Created a network of protected areas around the European Union of national and international importance, called 'Natura 2000' sites.
- Include all sites of conservation importance (not only threatened), for example Special Areas of Conservation (SAC) and Special Protection Areas (SPAs).
- These sites are designated by the Member States although the Community can, in exceptional cases, designate a site that it thinks is essential for the maintenance or survival of a priority natural habitat type.
- Two sets of criteria (Stage 1 and Stage 2).
- Stage 1 provides an assessment at national level of the relative importance of sites for each natural habitat type. Criteria are used by Member States to classify the sites which they propose on the national list as sites eligible for identification as sites of Community importance i.e. sites containing priority natural habitat types.
- Stage 2 provides an assessment of the Community importance of the sites included on the national lists. This includes all sites containing priority natural habitat types and additional sites identified by the Member States that meet Stage 2 criteria.

Scale

- Site-based.

Environment

- Terrestrial and aquatic (distinguished by geographic, abiotic and biotic features).
- Can be entirely natural or semi-natural.

6.6 United Kingdom

- Has a number of mechanisms to identify site-based areas of importance including:
 - Special Areas of Conservation (SAC) which have been given special protection under the EU Habitat Directive and include marine and terrestrial areas (236 sites).
 - Sites of Special Scientific Interest (SSSI) which are the best examples of the natural heritage of wildlife habitats, geological features and landform (over 4000 sites covering 7% of land area). Criteria include: naturalness, size (extent), rarity, and diversity.

6.7 Finland

- Initiated assessment to identify which habitat types (EU Habitat Directive) in Finland are threatened due to human activities.
- Classify habitat types as threatened, near-threatened and data deficient using the following main criteria: quantitative loss or qualitative deterioration of habitat types or the decline and degradation of rare habitat types.
- The assessment will focus on trends in the occurrence of habitat types over the last 50 years, prediction of future trends and evidence of declining trends before 1950 (in some cases). Rarity will also be considered.

6.8 South Africa

Irreplaceability / vulnerability

- The criteria of irreplaceability (the relative contribution of a site toward achieving biodiversity targets) and vulnerability (the likelihood of a site to be lost due to future land-use pressures) have been used to identify priority sites for conservation action.
- These criteria can also be used to identify ecosystems in need of protection.
- Sites of high irreplaceability (i.e. needed to achieve biodiversity targets) and high vulnerability (likely to be lost in the near future) should be prioritised.
- The irreplaceability criterion can take into account the current extent of habitat loss, the extent of current protection and biodiversity target. Sites where ecosystems are heavily transformed and not protected ecosystems but with high biodiversity targets, would have a high irreplaceability value.

National Spatial Biodiversity Assessment (2004)

- Determined ecosystem status of terrestrial, river, estuarine and marine environments.
- Status was applied to mapped ecosystems for each environment.
- Terrestrial ecosystems were mapped using the SANBI vegetation map which identifies 441 vegetation types (including wetlands). Vegetation types were

considered as appropriate biodiversity surrogates for plant and animal species diversity in South Africa.

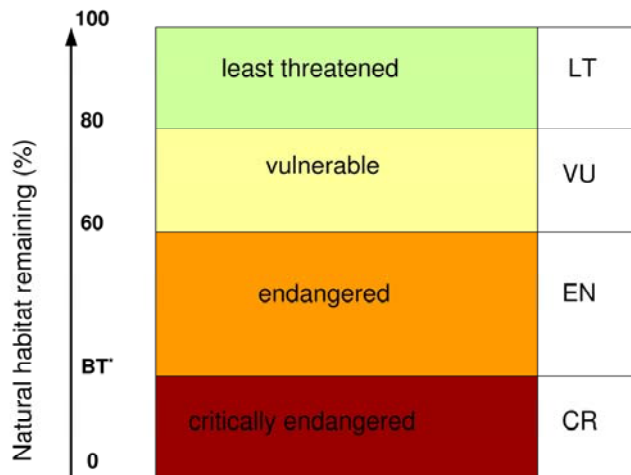
- Freshwater ecosystems were mapped using river heterogeneity signatures which identify 120 types based on geomorphology and hydrology.
- Estuary ecosystems were mapped using 5 categories (estuarine bay, permanently open estuary, river mouth, estuarine lake, and temporarily closed estuary) and three biogeographic zones (cool temperate, warm temperate and subtropical) resulting in 13 types.
- Marine ecosystems were mapped based on 34 broad marine biozones, extending from the coast to the end of the EEZ.
- Ecosystem status was based on how much of an ecosystem's original area remains intact, relative to three different thresholds. These thresholds are based on best available science.
- The threshold beyond which an ecosystem becomes critically endangered varies from 16% to 36%, depending on the ecosystem. The more species-rich the ecosystem the higher the threshold.
- This threshold is also called the biodiversity target, representing the proportion of each ecosystem one would ideally like included in a formal protected area.
- The thresholds in the diagram below apply to terrestrial ecosystems.
- The same principle and method was used to determine the status of river, estuarine and marine environments, but the thresholds were adapted to those environments.
- Only considered loss of natural habitat due to urban areas, cultivated areas, afforestation and mining (i.e. did not consider degradation).

Scale

- Based on ecosystem classification but applied nationally.

Environment

- Terrestrial, river, estuarine and marine but thresholds adapted.



* biodiversity target

6.9 WWF Ecoregions (2004)

- Ecoregion defined as 'a large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions.'
- 115 ecoregions identified in Africa.
- Used biological distinctiveness (biological value) and conservation status (level of conservation opportunity or threat) to assess ecoregions and set conservation priorities.
- Used a scoring system.
- Biological Distinctive Index (BDI): ecoregions were ranked into four classes depending on species values and scores from the non-species values.
 - globally outstanding
 - regionally outstanding
 - bioregionally outstanding
 - locally important
- Conservation Status Index (CSI): a weighted score was given to each of the attributes in the CSI using a point system of between 0 and 100. Five conservation categories were used:
 - Critical
 - Endangered
 - Vulnerable
 - Relatively stable
 - Relatively intact
- The CSI and BDI are integrated in a matrix ranking ecoregions into classes, providing an order of priority for conservation needs.

6.10 RAMSAR

- Internationally important wetlands.
- Set of nine criteria for identifying wetlands of international importance.
- Criteria split into two groups.
- Group A include sites containing representative, rare or unique wetland types.
- Group B include sites of international importance for conserving biological diversity.

6.11 Important Bird Areas (IBAs)

- The aim is to identify and protect a network of sites, at a biogeographical scale, critical for the long-term viability of naturally occurring bird populations, across the range of those bird species for which a site-based approach is appropriate.
- Four criteria which can be applied globally (A criteria), regionally (B criteria), and sub-regionally (C criteria).

6.12 Important Plant Areas (IPAs)

- Developed in Europe and defined as 'natural or semi-natural sites of exceptional botanical richness and/or supporting an outstanding assemblage of rare, threatened and/or endemic plant species and/or vegetation of high botanic value'.
- Identify priority areas for plant conservation at a site-based level, using consistent criteria (threatened species, botanical richness and threatened habitats).
- European criteria adapted for southern Africa.

6.13 Key Biodiversity Areas (KBAs)

- Defined as places of international importance for the conservation of biodiversity through protected areas and other government mechanisms.
- The goal is to identify, document and protect networks of globally important sites that are crucial for the long-term conservation of species.
- Identified nationally using four standard criteria.

6.14 IUCN Red List

- IUCN Red List Categories and Criteria classify species at high risk of global extinction.
- Nine categories include:
 - Extinct (EX): A taxon is Extinct when there is no reasonable doubt that the last individual has died.
 - Extinct in the Wild (EW): A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range. A taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), throughout its historic range have failed to record an individual. Surveys should be over a time frame appropriate to the taxon's life cycle and life form.
 - Critically Endangered (CR): A taxon is Critically Endangered when it is facing an extremely high risk of extinction in the wild in the immediate future, as defined by any of the criteria (A to E) as described below.
 - Endangered (EN): A taxon is Endangered when it is not Critically Endangered but is facing a very high risk of extinction in the wild in the near future, as defined by any of the criteria (A to E) as described below.

Vulnerable (VU): A taxon is Vulnerable when it is not Critically Endangered or Endangered but is facing a high risk of extinction in the wild in the medium-term future, as defined by any of the criteria (A to E) as described below.

Near Threatened (NT): A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for CR, E or VU now, but is close to qualifying for or is likely to qualify for a threatened category in the near future.

Least Concern (LC): A taxon is Least Concern when it has been evaluated against the criteria but does not qualify for CR, E , VU or NT. Widespread and abundant taxa are included in this example.

Data Deficient (DD): A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction based on its distribution and/or population status. A taxon in this category may be well studied, and its biology well known, but appropriate data on abundance and/or distribution is lacking. Data Deficient is therefore not a category of threat or Lower Risk. Listing of taxa in this category indicates that more information is required and acknowledges the possibility that future research will show that threatened classification is appropriate. It is important to make positive use of whatever data are available. In many cases great care should be exercised in choosing between DD and threatened status. If the range of a taxon is suspected to be relatively circumscribed, if a considerable period of time has elapsed since the last record of the taxon, threatened status may well be justified.

Not evaluated (NE): A taxon is Not Evaluated when it is has not yet been assessed against the criteria.

- Set of five criteria (A-E) and sub-criteria used to assess species. The criteria are based on different biological aspects that indicate the extinction risk of taxa and include:
 - Criterion A: Reduction in population size
 - Criterion B: Restricted geographic range and continuing decline
 - Criterion C: Small population size and continuing decline
 - Criterion D: Very small or restricted population
 - Criterion E: Based on quantitative analysis (based on life history, habitat, threats and any management options) that estimates the extinction probability of the taxon.

7 Criteria from other countries and initiatives for identifying threatened or protected ecosystems

The table below summarises criteria used for identifying threatened or protected ecosystems or similar from other countries and initiatives.

[attached as separate document]

8 Principles that should guide the development of criteria for identifying listed ecosystems in South Africa

This section sets out basic principles or starting points that should guide the development of criteria for identifying threatened or protected ecosystems. The principles should apply across all environments (marine, inland water, terrestrial), even if the criteria and/or thresholds differ across these environments.

8.1 Suggested principles

Suggested principles include the following:

- We want a repeatable, explicit approach to identifying threatened or protected ecosystems.
- We want a target-driven, systematic approach, where possible. This should be possible for threatened ecosystems but may not be possible for protected ecosystems.
- Any criterion must be able to be made spatially explicit / translate into a spatially explicit identification on an ecosystem.

Questions:

- Need to address the issue of whether degraded or non-viable examples of a threatened or protected ecosystem should be excluded from the definition of that ecosystem (e.g. very small or degraded fragments of a critically endangered vegetation type, highly degraded rivers and wetlands). This issue links with the mapping issues raised in Section 10.1.
- Related to this: If only certain sites within a threatened ecosystem are to be included, we need to develop criteria/thresholds for what's included and what's not.

8.2 National set of biodiversity features

An additional starting point needs to be the development of a set of biodiversity features that should be considered in the listing process.

Suggested features for this national set are:

- Vegetation types from the national vegetation map
- Forest types (DWAF has a more detailed map of forest types than those in the national vegetation map)
- River signatures, based on ecoregions, primary catchments, hydrological index and longitudinal zone (river signatures currently available do not include primary catchments in the classification hierarchy)
- Wetlands, classified according to national wetland classification system as well as vegetation groups or level 2 ecoregions
- Estuaries, classified according to type and biogeographical zone
- Selected marine ecosystems or habitats, including, for example, shallow subtidal temperate reefs, islands, bays, coastal dune fields

9 Suggested process for identifying and listing ecosystems

9.1 What the Biodiversity Act tells us about the process (very little)

- Minister or MEC may list threatened or protected ecosystems
- Consultation and public participation – as required in S99-100
- Lists must be reviewed every five years

9.2 Suggested principles / starting points

- Organs of state with a biodiversity conservation mandate should play the lead role in the process of identifying and listing threatened or protected ecosystems
- DEAT should co-ordinate the development of criteria, which should guide the identification of ecosystems for national and provincial lists, i.e. everyone should use the same set of criteria
- Ecosystems will be mapped at a variety of spatial scales, depending on the available data (see Section 10.1)
- Ecosystems within protected areas can be listed as threatened ecosystems. As discussed in Section 3.5, it is important from the point of view of protected area management plans to know which ecosystems within protected areas are threatened, so that they can be managed appropriately.

9.3 The need for a phased approach

- Suggest an explicit phased approach, recognising that a comprehensive list of threatened and protected ecosystems is not possible to achieve based on current data, especially because of the limitations of existing spatial data.
- Important immediate goal is to get the system up and running – to demonstrate that it is do-able and to build confidence in the process.
- Start with an initial national list based on available data. This initial list can be added to in subsequent phases.

9.4 Suggested steps for developing initial national list

- Finalise list of biodiversity features and criteria to be applied to those features. This may involve follow-up smaller workshops after the national workshop, particularly for inland water and marine ecosystems.
- DEAT does initial first-cut identification and mapping of threatened and protected ecosystems, based on NSBA and initial consultation with DWAF, SANParks and provincial conservation authorities.
- Refinement of first-cut map through consultation between DEAT, DWAF, SANParks, provincial conservation authorities, based on their best available spatial data and/or expert knowledge.
- Establishment of a Scientific Review Committee to provide input and comment on the draft list. (Should they also have stronger approval powers?)
- Targeted consultation with DoA (including ARC) and DME on the draft set of ecosystems to be listed

Questions

- How much ground-truthing and verification in the field?

9.5 What should go with the list?

9.5.1 Descriptions of listed ecosystems?

Should a description of each ecosystem be required, including e.g. identifiers of the ecosystem? This could help to resolve mapping inaccuracies resulting from scale issues or lack of data. Descriptions of ecosystem structure and functioning may be useful for the development of biodiversity management plans.

9.5.2 Regulations?

- Suggest that at the moment there is a strong enough regulatory framework.
- In future we may want to develop additional regulations linked to listed ecosystems (in terms of S97 of the Biodiversity Act).

9.5.3 Norms and standards for Biodiversity Management Plans

- Norms and standards for biodiversity management plans for listed ecosystems need to be developed.
- Norms and standards for biodiversity management plans for listed species are currently being developed – may be important frameworks/lessons from this process.

9.5.4 Handbook

- Suggest that this is necessary
- Intended audience:
 - Organs of state that need to take listed ecosystems into account, e.g. provincial environment affairs departments and municipalities (regulators)
 - Environmental assessment practitioners
 - SDF consultants
 - ...
- **Main purpose** would be to explain how we expect people to take listed ecosystems into account in environmental authorisation processes and planning processes (i.e. the content would link closely to the consequences of listing an ecosystem)
- Could also cover:
 - The rationale for listing ecosystems
 - How ecosystems were identified
 - Options for proactive management of listed ecosystems
 - ...

9.6 Communication with landowners and users of listed ecosystems

- An informal lesson from Australia: think carefully about communicating with landowners and users of listed ecosystems.

9.7 Enforcement

- This may be important for e.g. CR and EN ecosystems that trigger Basic Assessment Reports in terms of the EIA regs. What enforcement mechanisms are available if landowners or developers transgress? Should additional enforcement mechanisms be considered?

9.8 Reviewing the list

- Need to think about the process and timeframe for reviewing and adding to the initial national list.
- Also need to set up a longer term process for five-yearly (or more frequent) reviews of the list.

9.9 Monitoring listed ecosystems

Need to think about processes for monitoring listed ecosystems. Indicators and monitoring arrangements will form part of the national biodiversity monitoring and reporting framework, the development of which is being led by SANBI (first national workshop 27-29 November 2006).

10 Other issues that need to be addressed

10.1 Mapping issues

10.1.1 Must every listed ecosystem be mapped?

- It seems from the legislation that mapping is not essential, and that there may be options for verbal description of the location of the ecosystem.
- However, we would want to map ecosystems where possible. If an ecosystem is not mapped the environmental authorisation implications are difficult to apply.
- Should other identifiers be required in addition to the map of the ecosystem?
- In the marine environment there may be instances in which mapping is not possible, but in which listing an ecosystem allows for important proactive biodiversity management activities nonetheless?

10.1.2 What are the spatial scale parameters and other guidelines for mapping ecosystems?

- How accurate does the spatial delineation of a listed ecosystem need to be?
- What is the minimum spatial scale for mapping a listed ecosystem?
- Is an indicative map OK in some cases?
- Is point data OK or do we want a polygon or set of polygons for each listed ecosystem?
- OK to have overlapping listed ecosystems?

Specific issues for inland water ecosystems:

- NB to map buffers as well? In all cases?

10.1.3 Should the original extent or the remaining extent of an ecosystem be mapped?

- This question applies mainly to terrestrial ecosystems

- Mapping original extent is problematic because it will trigger environmental authorisation processes in vast areas where no natural habitat remains – this would be highly counterproductive
- BUT we know that our spatial data on remaining natural habitat is inadequate, so if we only map remaining extent we will miss some natural habitat and include some areas where there is no remaining natural habitat
- Suggest that on balance it is best to go with mapping only the remaining extent?
- Can clusters of remaining fragments be mapped rather than individual fragments? (e.g. fragments within a certain distance of each other)
- Should there be a size threshold below which fragments are not mapped? (This threshold could vary from ecosystem to ecosystem.)

10.2 What attribute information should be required?

- Suggest that some basic attribute information should be required for each ecosystem that is mapped
- Required attributes:
 - Name
 - Threatening processes (if a threatened ecosystem) (see Section 10.3)
 - ...
- Optional attributes
 - Description of important biodiversity/ecological characteristics
 - Description of condition (could have categories to chose from)
 - Threatening processes (if a protected ecosystem) (see Section 10.3)
 - Management recommendations?
 - ...

10.3 Should threatening processes be identified for every listed ecosystem?

- Suggest that for all threatened ecosystems, threatening processes should be identified

- Protected ecosystems may not be threatened, so identification of threatening processes should be optional for protected ecosystems
- How much detail do we want on threatening processes? Is “habitat loss” OK or do we want to know that it’s habitat loss as a result of, say, vineyards or rooibos tea plantations? Is “pollution” OK or do we want to know the type/source of pollution?

10.4 What is the link between listed ecosystems and critical biodiversity areas identified in a published bioregional plan?

- Suggest that **there is not a one-to-one relationship** between listed ecosystems and critical biodiversity areas
- **Critical biodiversity areas are likely to include some listed ecosystems, but need not include all listed ecosystems.** For example, if critical biodiversity areas are only those areas required to meet biodiversity targets, they are unlikely to include the full extent of endangered and vulnerable ecosystems.
- **Critical biodiversity areas are likely to include many areas that are not listed ecosystems.** For example, regional or local scale ecological corridors will not be listed as threatened or protected ecosystems. Also, as fine-scale biodiversity plans are done they are likely to identify biodiversity features at a fine scale that may meet the criteria for listed ecosystems but have yet to be listed. Such fine-scale features could be added when the list/s are reviewed.
- Perhaps **some categories of listed ecosystems** (e.g. critically endangered ecosystems) **should always be identified as critical biodiversity areas** in a bioregional plan? I.e. we could insist that all critically endangered ecosystems are included in the set of critical biodiversity areas in a bioregional plan.

Other issues:

- What about transboundary ecosystems? Criteria – are they different?, how to assess these ecosystems?

Appendix A: Sections of the Biodiversity Act that deal directly or indirectly with listed ecosystems

The relevant sections of the Biodiversity Act are:

- Sections 52-55 on protection of threatened and protected ecosystems
- Sections 43-46 on biodiversity management plans and biodiversity management agreements
- Section 97 on regulations that the Minister may make
- Section 9 on norms and standards that the Minister may issue
- Sections 99 and 100 on consultation and public participation

Protection of threatened or protected ecosystems

Ecosystems that are threatened or in need of protection

52. (1) (a) The Minister may, by notice in the Gazette, publish a national list of ecosystems that are threatened and in need of protection.

(b) An MEC for environmental affairs in a province may, by notice in the Gazette, publish a provincial list of ecosystems in the province that are threatened and in need of protection.

(2) The following categories of ecosystems may be listed in terms of subsection (1):

(a) critically endangered ecosystems, being ecosystems that have undergone severe degradation of ecological structure, function or composition as a result of human intervention and are subject to an extremely high risk of irreversible transformation;

(b) endangered ecosystems, being ecosystems that have undergone degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems;

(c) vulnerable ecosystems, being ecosystems that have a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention, although they are not critically endangered ecosystems or endangered ecosystems; and

(d) protected ecosystems, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed in terms of paragraphs (a), (b) or (c).

(3) A list referred to in subsection (1) must describe in sufficient detail the location of each ecosystem on the list.

(4) The Minister and the MEC for environmental affairs in a relevant province, respectively, must at least every five years review any national or provincial list published by the Minister or MEC in terms of subsection (1).

(5) An MEC may publish or amend a provincial list only with the concurrence of the Minister.

Threatening processes in listed ecosystems

53. (1) The Minister may, by notice in the Gazette, identify any process or activity in a listed ecosystem as a threatening process.

(2) A threatening process identified in terms of subsection (1) must be regarded as a specified activity contemplated in section 24(2)(b) of the National Environmental Management Act and a listed ecosystem must be regarded as an area identified for the purpose of that section.

Certain plans to take into account in protection of listed ecosystems

54. An organ of state that must prepare an environmental implementation or environmental management plan in terms of Chapter 3 of the National Environmental Management Act, and a municipality that must adopt an integrated development plan in terms of the Local Government: Municipal Systems Act, 2000 (Act No. 32 of 2000), must take into account the need for the protection of listed ecosystems.

Amendment of notices

55. The Minister or the MEC for Environmental Affairs in any relevant province may, by notice in the Gazette, amend or repeal any notice published by him or her in terms of section 52(1) or 53(1).

Biodiversity management plans

43. (1) Any person, organisation or organ of state desiring to contribute to biodiversity management may submit to the Minister for his or her approval a draft management plan for—

(a) an ecosystem—

(i) listed in terms of section 52; or

(ii) which is not listed in terms of section 52 but which does warrant special conservation attention;

(2) Before approving a draft biodiversity management plan, the Minister must identify a suitable person, organisation or organ of state which is willing to be responsible for the implementation of the plan.

(3) The Minister must—

(a) publish by notice in the Gazette a biodiversity management plan approved in terms of subsection (1);

(b) determine the manner of implementation of the plan; and

(c) assign responsibility for the implementation of the plan to the person, organisation or organ of state identified in terms of subsection (2).

Biodiversity management agreements

44. The Minister may enter into a biodiversity management agreement with the person, organisation or organ of state identified in terms of section 43(2), or any other suitable person, organisation or organ of state, regarding the implementation of a biodiversity management plan, or any aspect of it.

Contents of biodiversity management plans

45. A biodiversity management plan must—
- (a) be aimed at ensuring the long-term survival in nature of the species or ecosystem to which the plan relates;
 - (b) provide for the responsible person, organisation or organ of state to monitor and report on progress with implementation of the plan; and
 - (c) be consistent with—
 - (i) this Act;
 - (ii) the national environmental management principles;
 - (iii) the national biodiversity framework;
 - (iv) any applicable bioregional plan;
 - (v) any plans issued in terms of Chapter 3 of the National Environmental Management Act;
 - (vi) any municipal integrated development plan;
 - (vii) any other plans prepared in terms of national or provincial legislation that is affected; and
 - (viii) any relevant international agreements binding on the Republic.

Review and amendment of biodiversity management plans

46. (1) The Minister must review a biodiversity management plan published in terms of section 43(3) at least every five years, and assess compliance with the plan and the extent to which its objectives are being met.

(2) The Minister, either on own initiative or on request by an interested person, organisation or organ of state, may by notice in the Gazette amend a biodiversity management plan published in terms of section 43(3).

(3) Before amending a biodiversity management plan, the Minister must consult—

- (a) any person, organisation or organ of state implementing the plan; and
- (b) any organ of state whose activities are affected by the implementation of the plan.

Regulations by Minister

97. (1) The Minister may make regulations relating to—

- (a) the monitoring of compliance with and enforcement of norms and standards referred to in section 9;
- (b) ... (vi) the minimising of the threat to the ecological integrity of a listed ecosystem;

Norms and standards

9. (1) The Minister may, by notice in the Gazette—

(a) issue norms and standards for the achievement of any of the objectives of this Act, including for the—

(i) management and conservation of South Africa's biological diversity and its components;

(ii) restriction of activities which impact on biodiversity and its components;

(b) set indicators to measure compliance with those norms and standards; and

(c) amend any notice issued in terms of paragraph (a) or (b).

...

(3) Norms and standards may apply—

(a) nationwide;

(b) in a specific area only; or

(c) to a specific category of biodiversity only.

(4) Different norms and standards may be issued for—

(a) different areas; or

(b) different categories of biodiversity.

Consultation

99. (1) Before exercising a power which, in terms of a provision of this Act, must be exercised in accordance with this section and section 100, the Minister must follow an appropriate consultative process in the circumstances.

(2) The Minister must, in terms of subsection (1)—

(a) consult all Cabinet members whose areas of responsibility may be affected by the exercise of the power;

(b) in accordance with the principles of co-operative governance set out in Chapter 3 of the Constitution, consult the MEC for Environmental Affairs of each province that may be affected by the exercise of the power; and

(c) allow public participation in the process in accordance with section 100.

Public participation

100. (1) The Minister must give notice of the proposed exercise of the power referred to in section 99—

(a) in the Gazette; and

(b) in at least one newspaper distributed nationally, or if the exercise of the power may affect only a specific area, in at least one newspaper distributed in that area.

(2) The notice must—

(a) invite members of the public to submit to the Minister, within 30 days of publication of the notice in the Gazette, written representations on, or objections to, the proposed exercise of the power; and

(b) contain sufficient information to enable members of the public to submit meaningful representations or objections.

(3) The Minister may in appropriate circumstances allow any interested person or community to present oral representations or objections to the Minister or a person designated by the Minister.

(4) The Minister must give due consideration to all representations or objections received or presented before exercising the power.

Functions of SANBI

11. (1) The Institute—

(a) must monitor and report regularly to the Minister on—

(ii) the conservation status of all listed threatened or protected species and listed ecosystems

Monitoring

49. (1) The Minister must for the purposes of this Chapter designate monitoring mechanisms and set indicators to determine—

(a) the conservation status of various components of South Africa's biodiversity; and

(b) any negative and positive trends affecting the conservation status of the various components.

(2) The Minister may require any person, organisation or organ of state involved in terms of subsection (1) in monitoring the matters referred to in that subsection to report regularly to the Minister on the results of such monitoring measured against the predetermined indicators.

(3) The Minister must—

(a) annually report to Parliament on the information submitted to the Minister in terms of subsection (2); and

(b) make such information publicly available.

Appendix B: Relevant sections of NEMA (as amended)

The relevant sections are:

- 24(2)-(3)
- 24A
- 24B
- 24D

24. Environmental authorisations

(2) The Minister, and every MEC with the concurrence of the Minister, may identify -

- (a) activities which may not commence without environmental authorisation from the competent authority;
- (b) geographical areas based on environmental attributes in which specified activities may not commence without environmental authorisation from the competent authority;
- (c) geographical areas based on environmental attributes in which specified activities may be excluded from authorisation by the competent authority;
- (d) individual or generic existing activities which may have a detrimental effect on the environment and in respect of which an application for an environmental authorisation must be made to the competent authority:

Provided that where an activity falls under the jurisdiction of another Minister or MEC, a decision in respect of paragraphs (a) to (d) must be taken after consultation with such other Minister or MEC.

(3) The Minister, and every MEC with the concurrence of the Minister, may compile information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account by every competent authority.

[S.24 substituted by S.2 of Act 8/2004]

24A. Procedure for listing activity or area

Before identifying any activity or area in terms of section 24(2), the Minister or MEC, as the case may be, must publish a notice in the relevant Gazette -

- (a) specifying, through description, a map or any other appropriate manner, the activity or area that it is proposing to list;
- (b) inviting interested parties to submit written comments on the proposed listing within a period specified in the notice.

[S.24A inserted by S.3 of Act 8/2004]

24B. Procedure for delisting of activities or areas

- (1) The Minister may delist an activity or area identified by the Minister in terms of section 24(2).
- (2) An MEC may, with the concurrence of the Minister, delist an activity or area identified by the MEC in terms of section 24(2).
- (3) The Minister or MEC, as the case may be, must comply with section 24A, read with the changes required by the context, before delisting an activity or area in terms of this section.

[S.24B inserted by S.3 of Act 8/2004]

24D. Publication of list

The Minister or MEC, as the case may be, must publish in the relevant Gazette a notice listing activities and areas identified in terms of section 24(2) and listing the competent authorities identified in terms of section 24C and the date on which the list is to come into effect.

[S.24D inserted by S.3 of Act 8/2004]