The Legal Framework for Biodiversity Protection and Conservation in South Africa: an Appraisal of the Listing of Threatened Species Approach

By

Emma Smith

SMTEMM002

Masters Degree in Philosophy with specialization in Environmental Law

Supervisor

Jan Glazewski

Research dissertation presented for the approval of Senate in fulfillment of part of the requirements for the Masters in Philosophy with specialization in Environmental Law in approved courses and a minor dissertation. The other part of the requirement for this qualification was the completion of a programme of courses.

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Abstract

'In the end, we will conserve only what we love, we will love only what we understand, and we will understand only what we are taught.' **Baba Dioum**

The conservation and protection of biodiversity is becoming increasingly relevant across all social, economic and environmental sections of the world we live in today. The world's conscience is in state of confusion as together with the need to ensure economic growth and development, there is also a need to preserve our natural environment for present and future generations to enjoy and benefit from. This crisis of environmental conscience can be dealt with in the laws that are made and in the implementation, management and enforcement of these laws.

The Department of Environmental Affairs and Tourism (now known as the Department of Water and Environmental Affairs) in South Africa has promulgated a suite of conservation tools that may be used in order to ensure that species are protected inside and outside the borders of proclaimed conservation areas. One of these tools is to produce Threatened Species Lists (TSLs) that identify species that require protection from possible extinction due to predominantly human-induced activities. Species are assigned categories of threat according to the degree to which they are under threat and the nature of criteria that has been developed. This study focuses on the progression of TSLs from the development of global and national Red Data Lists to how they are incorporated into South African law as Lists of Critically Endangered, Endangered, Vulnerable and Protected Species published in terms of the National Environmental Management: Biodiversity Act 10 of 2004.

Abbreviations

CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CSIR	Council for Scientific and Industrial Research
DEAT	Department of Environmental Affairs and Tourism
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
ECA	Environment Conservation Act 73 of 1989
EIA	Environmental Impact Assessment
EIP	Environmental Implementation Plan
EMI	Environmental Management Inspector
EMP	Environmental Management Plan
EWT	Endangered Wildlife Trust
GMO	Genetically Modified Organism
IUCN	International Union for the Conservation of Nature and Natural Resources
IEM	Integrated Environmental Management
MEC	Member of the Executive Council
NBI	National Botanical Institute
NEMA	National Environmental Management Act 107 of 1998
NEMBA	National Environmental Management: Biodiversity Act 10 of 2004
NEMPAA	National Environmental Management: Protected Areas Act 39 of 2004
NPER	South African National Programme for Ecosystem Research

SANBI	South African National Biodiversity Institute
SCA	Supreme Court of Appeal
SEMA	Specific Environmental Management Act
SSC	Species Survival Commission,
TBVC	Transkei Bophuthatswana Venda Ciskei
ToPS	Threatened or Protected Species Regulations
TSL	Threatened Species List

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Chapter 1: Introduction

1.1 What is biodiversity and why is it important

Biological diversity or biodiversity is defined as all living organisms, including flora and fauna and the area which they inhabit.[1] A more formal definition is found in the Convention on Biological Diversity (CBD)[2] where biodiversity is defined as

> the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.[3]

The National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) follows an almost identical definition as the one found in the CBD.[4]

South Africa is the third most biologically diverse country in the world mainly due to its plant life but it also boasts a wide variety of animal life.[5] This richness in biodiversity is evident all along its coastline (approximately 3200 km long) and deep into the hinterland. Currently, South Africa is home to approximately 5.8% of the world's mammal species, 8% of the world's bird species, 4.6% of the world's reptile species, 16% of marine fish species and 5.5% of the world's recorded insect species. With regard to endemic species, South Africa is the fifth richest in Africa and the 24th richest in the world.[6] It is a country that contains

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[1] Jan Glazewski *Environmental Law* (2005) 257.
[2] The Convention on Biological Diversity came into effect on 29 December 1993. South Africa became a party when it ratified the Convention on 2 November 1995. More information on the Convention can be found at www.cbd.int.
[3] Article 2 of the CBD.
[4] Section 1 in NEMBA defines "biological diversity" or "biodiversity" as the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
[5] Glazewski, op cit pages 257- 258
[6] http://www.environment.gov.za/enviro-info/nat/bioatlas.htm accessed on 12 June 2011.

approximately 24 000 vascular plant species and has one of the highest species densities in the world.[7] Furthermore, South Africa is the only country in the world to have one of the six plant kingdoms in the world, the Cape Floral Kingdom (fynbos biome), located within its borders and nowhere else in the world.[8]

According to Glazewski[9], the term biodiversity is made up of three components: genetic biodiversity; species biodiversity; and ecosystem biodiversity. Genetic biodiversity refers to the variation of genes within a species so as to allow for new and more resilient breeds of species to develop so as to help them adapt to changing conditions. Species diversity refers to a variety of species within a region which enable a population of organisms to interbreed freely in natural conditions. Here a group of species inhabits a particular geographical area and may become synonymous with it, for example the fynbos biome in the Western Cape of South Africa. Ecosystem diversity describes a variety of ecosystems within a region and consists of communities of animals, plants, micro-organisms and the soil, water and air on which they depend on for survival. This component of biodiversity refers to the interconnectedness of the processes on which life on earth depend i.e. water cycle, energy flow, oxygen production, soil formation and nutrient recycling. Here a variety of ecosystems inhabit a particular political or geographical boundary.

Biodiversity is of extreme value to all those who inhabit the earth as it provides socio-economic and environmental benefits to humans and natural ecosystems. Many South Africans rely on biodiversity as a means of survival. Biodiversity provides economic, cultural, spiritual and aesthetic benefits such as those benefits associated with tourism, agriculture and aquaculture. Biodiversity provides ecosystem services such as nutrient storage and recycling, it contributes to climate stability, pollution breakdown and absorption, protection of water resources, soil formation and assists in quick recovery do to unpredictable

[7] Glazewski, op cit page 257.
[8] Michael Kidd *Environmental Law* 2 ed (2008) 89.
[9] Ibid.

natural events.[10] Healthy ecosystems such as wetlands purify water and control flooding and plants remove pollutants from the air and absorb harmful greenhouse gases such as carbon dioxide.[11]

Biodiversity also provides biological resources such as food; medicinal resources and pharmaceutical drugs; wood products; genetic, species and ecosystem diversity; breeding stocks and population reservoirs. Terrestrial and aquatic ecosystems are a major food source throughout the world and provide a livelihood to many farmers and fishermen and their employees. Social benefits of biodiversity include recreation and tourism; research and education; and cultural values.[12]

South Africa is a highly biodiverse country and the protection and conservation of this biodiversity is not only of importance nationally but it is also important to the rest of the world. Sadly, this importance is not being recognised and appreciated as through the systematic degradation and overexploitation of biodiversity great losses are being experienced. The next section examines human threats as well as natural threats to biodiversity.

1.2 Threats to biodiversity

There exist many threats to biodiversity in South Africa. Some threats may be due to natural means such as the occurrence of devastating climatic events (such as floods and droughts) or as a result of human activities such as the introduction of alien and invasive species. Other human-induced activities that have been well documented and which are also potentially threatening to

[10] http://www.globalissues.org/article/170/why-is-biodiversity-important-who-cares accessed 8 June 2011

[11] Department of Environmental Affairs and Tourism. 2006. South Africa Environment Outlook. A report on the state of the environment. Executive summary and key findings. Department of Environmental Affairs and Tourism, Pretoria page 12.

[12] http://www.globalissues.org/article/170/why-is-biodiversity-important-who-cares accessed 8 June 2011

biodiversity include the introduction of genetically modified organisms (GMOs),[13] restricted activities,[14] the illegal trade in threatened and protected species, bioprospecting[15] and/or the commercialisation of indigenous biological resources.

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[13] Section 1 of the Genetically Modified Organisms Act 15 of 1997defines GMOs as 'an organism the genes or genetic material of which has been modified in a way that does not occur naturally through mating or natural recombination or both, and "genetic modification" shall have a corresponding meaning'.

[14] Section 1 of NEMBA defines "restricted activity" as-

(a) in relation to a specimen of a listed threatened or protected species, means-

(i) hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means, method or device whatsoever, including searching, pursuing, driving, lying in wait, luring, alluring, discharging a missile or injuring with intent to hunt, catch, capture or kill any such specimen;

(ii) gathering, collecting or plucking any specimen of a listed threatened or protected species;

(iii) picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species;

(iv) importing into the Republic, including introducing from the sea, any specimen of a listed threatened or protected species;

(v) exporting from the Republic, including re-exporting from the Republic, any specimen of a listed threatened or protected species;

(vi) having in possession or exercising physical control over any specimen of a listed threatened or protected species;

(vii) growing, breeding or in any other way propagating any specimen of a listed threatened or protected species, or causing it to multiply;

(viii) conveying, moving or otherwise translocating any specimen of a listed threatened or protected species;

(ix) selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of a listed threatened or protected species; or

(x) any other prescribed activity which involves a specimen of a listed threatened or protected species; and

(b) in relation to a specimen of an alien species or listed invasive species, means-

(i) importing into the Republic, including introducing from the sea, any specimen of an alien or listed invasive species;

(ii) having in possession or exercising physical control over any specimen of an alien or listed invasive species;

(iii) growing, breeding or in any other way propagating any specimen of an alien or listed invasive species, or causing it to multiply;

(iv) conveying, moving or otherwise translocating any specimen of an alien or listed invasive species;

(v) selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of an alien or listed invasive species; or

(vi) any other prescribed activity which involves a specimen of an alien or listed invasive species.

[15] Section 1 of NEMBA defines "bioprospecting" as

in relation to indigenous biological resources, means any research on, or development or application of, indigenous biological resources for commercial or industrial exploitation, and includes-

(a) the systematic search, collection or gathering of such resources or making extractions from such resources for purposes of such research, development or application;

Increases in threats brought about by the unauthorised introduction and spread of alien[16] and invasive[17] species has become a major threat to biodiversity in South Africa. Reasons forwarded for these increases is due to improvements in transportation, globalisation and climate change, urbanisation (and the need to recreate familiar conditions of home), the importation of agricultural and industrial raw materials, and the release of ballast water containing alien and invasive aquatic species from ocean-going ships, amongst others. [18]

Although South Africa is blessed with an abundance of biodiversity, its biodiversity is one of the most threatened in the world.[19] Furthermore, according to the Working for Water Programme which is administered by the Department of Water Affairs, invasive alien species cause huge financial damage to the economy each year and is considered to be the greatest threat to South Africa's biodiversity.[20] Invasive alien species are known to: threaten biodiversity as they diminish water resources and impact on water security; cause soil erosion as runoff is increased; affect the ecological functioning of natural systems; adversely affect the fertility of soil used for agricultural purposes; and intensify the occurrence flooding and fires.[21] Invasive species are known to thrive in some areas that are not their place of origin. It is estimated that alien invasive plants

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(b) the utilisation for purposes of such research or development of any information regarding any traditional uses of indigenous biological resources by indigenous communities; or
(c) research on, or the application, development or modification of, any such traditional uses, for commercial or industrial exploitation.

[16] Section 1 of NEMBA defines "alien species" as
(a) a species that is not an indigenous species; or
(b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.

[17] Section 1 of NEMBA defines "invasive species" as
any species whose establishment and spread outside of its natural distribution range-
(a) threaten ecosystems, habitats or other species or have demonstrable potential to threaten ecosystems, habitats or other species; and
(b) may result in economic or environmental harm or harm to human health.

[18] McNeely.J. 'Invasive Species: A Costly Catastrophe for Native Biodiversity' (2001) *Land Use and Water Resources Research* 1: 1-10 page 2

[19] A R Paterson 'Clearing a Path towards Effective Alien Invasive Control: The Legal Conundrum' (2006) *Potchefstroom Electronic Law Journal* 9(1) page 162.

[20] http://www.dwaf.gov.za/wfw/ accessed 12 June 2011.

[21] Paterson (2006), op cit page 152

already cover about 10% of South Africa's surface and this percentage is continuously increasing at an alarming rate.[22]

Controlling alien and invasive species is not only a national but also a regional and international problem as the issue is dealt with in a number of international and regional conventions.[23] The South African government recognizes the threats imposed by alien and invasive species on biodiversity and indigenous species, amongst others, and subsequently has created the Working for Water programme, the Ukuvuka Campaign and the Working on Fire programme. Furthermore, an entire chapter[24] in NEMBA has been dedicated to species and organisms posing potential threats to biodiversity.

Of particular note is the impact of climate change on biodiversity. Due to the increased reliance of humans on fossil fuels for transportation, global trade and the production of commodities, changes in climate the world over are having adverse effects on food production. Existing species are no longer able to cope and adapt to these changes and as a result poor harvests and a decline in agricultural productively are being experienced. This phenomenon has led to a greater reliance on GMOs as they are more adaptive and resilient to pests and herbicides. GMOs are able to 'interact with other forms of life, reproduce, transfer their characteristics and mutate in response to environmental influences.'[25] Fewer insecticides and less-toxic herbicides are needed on GMO crops and similar yields can be achieved on smaller pieces of land.[26]

Unfortunately, along with the benefits attached to the production of GMOs is the related harm to the environment which they can cause. Some of the risks associated with GMOs include

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[22] http://www.dwaf.gov.za/wfw/ accessed 12 June 2011.
[23] Article 8(h) of the Convention on Biological Diversity.
[24] Chapter 5 of NEMBA.
[25] L. Feris 'Risk Management and Liability for Environmental Harm caused by GMOs – the South African Regulatory Framework' (2006) *Potchefstroom Electronic Law Journal* 9 (1).
[26] H A Strydom & N D King (eds) in Fuggle and Rabie's *Environmental Management in South Africa* 2 ed (2009) Juta and Company Ltd page 948.

(i) producers can no longer use their own seed, but become dependent on a supplier of patented seed;
(ii) the seed selected for adaptation to local conditions is replaced by GM seed with reduced genetic diversity;
(iii) the genes from herbicide-resistant varieties may be transferred to wild relatives, creating super weeds;
(iv) gene transfer and recombination could create new pathogens;
(v) adverse effects on non-target organisms; and
(vi) allergic or immune system reactions to GM crops.[27]

Thus, despite the advantages associates with GMO crops, they remain one of the major threats to biodiversity and have resulted in a decline in existing genetic, species and ecosystem biodiversity the world over.

South Africa is the tenth largest producer of genetically modified crops in the world[28]and is fast becoming one of the world leaders in the production of GMO crops. It is also one of a few African countries that is a signatory to the Cartegena Protocol of the Convention of Biological Diversity. The Cartegena Protocol has adopted the precautionary principle with regard to biosafety and aims to regulate all bio-engineered and GMOs so as to ensure the safe transfer, handling and use or living modified organisms that have resulted from biotechnology so as not to have adverse impacts on humans and biodiversity. Developing countries are also protected through the implementation of the principle of informed consent,[29] the existence of Biosafety Clearing Houses,[30] and strict labelling requirements as they lack the financial resources to protect their people and biodiversity from unintended admissions of GMOs into the environment. In order to fulfil its compliance commitments set out in the

[27] Ibid.
[28] Anton Christo Welgemoed 'Genetically modified organisms: tamed kitten or tiger by the tail?' (2007) *Comparative and International Law Journal of Southern Africa* Vol 40 Issue 2 pages 259 - 279
[29] The importing country must subject the other country that wishes to import GMOs to strict consent. This includes a detailed shipment letter stating all information regarding the GMO that is to be imported.
[30] For more information on the Biosafety Clearing House see www.cbd.int/biosafety.

Cartegena Protocol, South Africa has promulgated the Genetically Modified Organisms Act 15 of 1997. This Act places a duty of care on the users of GMOs to ensure that appropriate measures are taken to ensure that an adverse impact of the GMOs on the environment is avoided.[31]

Individuals who take part in restricted activities[32] involving listed threatened or protected species, certain alien species as well as listed invasive species are also a threat to biodiversity. NEMBA prohibits any person from carrying out a restricted activity involving threatened and protected species,[33] alien species[34] and invasive species[35] without a permit issued in terms of Chapter 7. The definition also includes the illegal trade in threatened and protected species as a restricted activity.[36] The permit system is a command and control mechanism to measure environmental compliance and to keep a check of those who take part in restricted activities. In some cases such as with GMOs, certain restricted activities require that an Environmental Impact Assessment (EIA) first be carried out before a permit is granted.[37]

The bioprospecting of genetic material obtained from indigenous biological resources may also be considered as a threat to biodiversity. South Africa is highly vulnerable and susceptible to bioprospecting as it is a richly biologically diverse country with high levels of endemism in the plant kingdom and renowned intraspecific genetic diversity. Bioprospecting is a very attractive option here as the rich biodiversity coupled with a well-developed infrastructure and scientific

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[31] Section 17 of GMO Act.
[32] Section 1 of NEMBA defines restricted activity, see Footnote 14.
[33] Section 57(1) of NEMBA.
[34] Section 65(1) of NEMBA.
[35] Section 71(1) of NEMBA.
[36] Section 1(a)(ix) of NEMBA.
[37] Section 78(1) of NEMBA provides that 'If the Minister has reason to believe that the release of a genetically modified organism into the environment under a permit applied for in terms of the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997), may pose a threat to any indigenous species or the environment, no permit for such release may be issued in terms of that Act unless an environmental impact assessment has been conducted in accordance with Chapter 5 of the National Environmental Management Act as if such release were a listed activity contemplated in that Chapter'.

research capacity ensures that the potential for developing new medicines, crops and cosmetics is relatively high. [38] However, despite the benefits, bioprospecting can greatly adversely impact on biologically diverse resources if left unchecked and unregulated. Furthermore, the general public may feel that their natural and cultural heritage is being sold off and no benefits of bioprospecting are being passed down to their families.

The South African example of the succulent plant *Hoodia* illustrates how the needs of local communities who hold traditional knowledge in trust can be overlooked. In this situation, the Council for Scientific and Industrial Research (CSIR) patented the *Hoodia* plant for its benefits in combating obesity in humans. However, the CSIR failed to obtain the prior informed consent from the indigenous San people before patenting the plant. This resulted in the San people acquiring very limited benefits from the patent. NEMBA together with the Access and Benefit Sharing Regulations[39] aims to remedy this problem by providing for 'the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources'.[40]

1.3 Why biodiversity should be protected in South Africa

Human activities are constantly threatening the existence of species and ecosystems. Resource scarcity is increasing and habitat destruction is taking place at an alarming rate. Our natural resources are being over-exploited and are becoming increasingly threatened. Now, more than ever, a more determined commitment from all role players is needed to put a halt to the unchecked resource depletion, habitat destruction and pollution of biodiversity before it is too late.

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[38] Wynberg R and Taylor M 'Finding a Path through the ABS Maze – Challenges of Regulating Access and Benefit Sharing in South Africa' (2009) in E C Kamau & G Winter (eds.) *Genetic Resources, Traditional Knowledge and the Law: Solutions for Access and Benefic Sharing* Earthscan Publications Ltd London Chapter 11 page 203

[39] Government Notice R.138 in *Government Gazette* 30739 dated 8 February 2008.

[40] Section 2(a)(iii) of NEMBA.

But why should we bother with protecting our biodiversity? Every human being has a moral responsibility to ensure that the beauty of our natural resources that the current generation is fortunate enough to enjoy today is preserved for future generations to enjoy tomorrow. This inter-generational equity is considered as one of the fundamental principles entrenched in the CBD and in NEMBA. It is simply unfair for future generations to have to suffer and pay the consequences of the current generation's short-sightedness, poor judgment and greed. A major paradigm shift and substantial change in mindset needs to be achieved. Constructive and effective biodiversity conservation from government and the private sector is needed.

Our biodiversity must be protected and conserved not only because it is morally the right thing to do but also because we are compelled to do so. Our responsibilities as citizens of South Africa are set out in legislation. In particular, a duty on individuals and the State is provided for in section 24 of the Constitution of the Republic of South Africa 1996 ("Constitution") which some commentators believe 'now embodies the imperatives and constitutional mandate for environmental compliance and enforcement'.[41] The environmental right contained in the Constitution is as follows

> Everyone has the right
> a. to an environment that is not harmful to their health or well-being; and
> b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that
> i. prevent pollution and ecological degradation;
> ii. promote conservation; and
> iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

[41] Alexander Paterson and Louis J Kotzé *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (2009) Juta and Company Ltd page 133.

Subsection (a) provides that every South African has a fundamental right to live in an environment that is not harmful to their health or well-being. Subsection (b) of the environmental right is a socio-economic right and places a duty on the State to secure and ensure that the right is recognised by reasonable legislation and other measures. Contained in this subsection is direct reference to the principle of intergenerational equity where the current generation has a duty to ensure that future generations are also able to benefit from the environment as they have done. Hence there is a moral need to protect the environment from pollution and ecological degradation, to promote conservation and to give effect to the notion of sustainable development.

The meaning of 'environment' is also relevant and is defined as

> 'environment' means the surroundings within which humans exist and that are made up of –
>
> (iv) the land, water and atmosphere of the earth;
>
> (iv) micro-organisms, plant and animal life;
>
> (iv) any part or combination of (i) and (ii) and the interrelationships among and between them; and
>
> (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being;[42]

Since the above definition includes the natural environment in its definition it is assumed that it too should not be in a state so as to cause harm to humans' health and well-being. Harm to humans in this regard can be construed as spiritual or psychological harm due to an inability to relax in the presence of nature. Thus, it would be to the benefit of humans to not cause harm to the natural environment as a degraded environment adversely affects the health and well-being of humans. This is largely a subjective viewpoint.

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[42] Section 1 of NEMA.

The environmental right is largely anthropocentric in nature as it considers the needs of the people of South Africa above the rights of the environment itself. Glazewski sums it up by stating that anthropocentrism is an approach which "allows humans to act as they please with respect to nature, provided they are serving human nature."[43] This approach is also reflected in one of NEMA's principles of environmental management

> Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.[44]

Fortunately, from an environmental point of view, other National Environmental Management Principles are provided for under section 2 of NEMA. Moreover, these principles have been premised on those contained in international environmental law, specifically the CBD. NEMA attaches five conditions and identifies eighteen environmental management principles which are to be applied throughout South Africa to all organs of state that may significantly affect the environment.[45]

The five conditions attached to the environmental management principles state that

- social and economic rights set out in the Bill of Rights, particularly those of previously disadvantaged persons, must be considered;[46]
- they are to be seen as assisting in the formulation of environmental policies by the relevant organs of state and not to control how organs of state function;[47]

[43] Glazewski, op cit page 7.
[44] Section 2(2) of NEMA.
[45] Section 2(1) of NEMA.
[46] Section 2(1)(a) of NEMA.
[47] Section 2(1)(b) of NEMA and Glazewski, op cit page 138.

- organs of state must consult these principles when undertaking any decision in terms of NEMA or any other statute dealing with the protection of the environment;[48]
- a conciliator appointed under NEMA is to consult these principles when required to make recommendations;[49] and
- they must be used as a guide to interpret, administer and implement NEMA and any other statutory provision dealing with the protection or management of the environment.[50]

The eighteen environmental management principles set out in section 2 of NEMA deal with a wide range of issues. At the forefront of the list of principles is the need to consider the needs of those people previously disadvantaged due to unfair discrimination in the past.[51] This is predominantly an issue specific to South Africa. However, another fundamental principle is that of the concept of sustainable development[52] where "development must be socially, environmentally and economically sustainable."[53] Eight sub-principles expanding on sustainable development are provided for under section 2(4)(a) which "stipulate internationally emerging environmental norms such as the precautionary principle, the preventative principle and the polluter pays principle."[54] Other important principles that are mentioned deal with, amongst others, environmental justice,[55] an adequate public participation process,[56] the benefits of traditional knowledge,[57] environmental education and awareness,[58] open and transparent environmental decision making,[59] co-operative government between organs of state coupled with adequate conflict resolution procedures in

[48] Section 2(1)(c) of NEMA.
[49] Section 2(1)(d) of NEMA.
[50] Section 2(1)(e) of NEMA.
[51] Section 2(a) of NEMA.
[52] Section 2(4) of NEMA.
[53] Section 2(3) of NEMA.
[54] Glazewski, op cit page 141.
[55] Section 2(c) of NEMA.
[56] Section 2(f) of NEMA.
[57] Section 2(g) of NEMA.
[58] Section 2(h) of NEMA.
[59] Section 2(k) of NEMA.

place ,[60] public trust doctrine,[61] polluter pays principle,[62] and the role of women and the youth in environmental management.[63]

NEMBA also provides that the State is the trustee of biological diversity in South Africa and that its organs are responsible for implementing legislation. The State and its organs are required to

(a) manage, conserve and sustain South Africa's biodiversity and its components and genetic resources; and
(b) implement this Act to achieve the progressive realisation of those rights.[64]

It is not only the State's responsibility to protect the environment. Duty also falls on the shoulders of the individual and private bodies to ensure that their actions do not detrimentally harm on the environment. Section 8(2) of the Constitution deals with the application of the Bill of Rights and 'binds a natural or a juristic person if, and to the extent that, it is applicable, taking into account the nature of the right and the nature of any duty imposed by the right'.

1.4 Research methodology

A desktop approach was used in this study and began with an assessment of all the national and provincial legislation relevant to the protection and conservation of biodiversity in South Africa. A distinction was made between legislation promulgated before South Africa ratified the CBD in 1995 and legislation promulgated after 1995. The conservation of biodiversity before 1994 was mostly dealt with by the four provincial ordinances where identified species requiring particular attention such as hunting permits were contained in lists attached as appendices to those ordinances. Post ratification, a number of

[60] Sections 2(l) and 2(m) of NEMA.
[61] Section 2(o) of NEMA.
[62] Section 2(p) of NEMA.
[63] Section 2(q) of NEMA.
[64] Section 3 of NEMBA.

national environmental laws such as the National Environmental Management: Protected Areas Act (NEMPAA) and, more importantly, NEMBA were promulgated. The compilation of these two Acts was directly influenced by obligations and responsibilities set out in the CBD.

The study was an appraisal on the utility of threatened species lists as an environmental management tool for the protection and conservation of biodiversity. Most of the information dealing with the development and use of national, regional and global threatened species lists was found on the IUCN and SANBI website on the internet. Current literature from journal articles, case law and books were also referred to. A thorough study of the role, benefits and shortcomings of the IUCN Red List was assessed as well as how the IUCN Red List influenced the development of the *Red Data Book for Mammals of South Africa* of 2004. Furthermore, an evaluation was carried out on the *Red Data Book for Mammals of South Africa* and how it informed the promulgation of the ToPS list, if at all. The ToPS list was also placed under scrutiny as the only legally binding list of threatened species published to date.

1.5 Overview of chapters

This paper begins with a brief overview of what biodiversity means, the reasons behind the need to protect and conserve biodiversity, and the threats that detrimentally impact on biodiversity. A brief introduction into the predominant environmental legislation dealing with biodiversity protection that prevails in the South African context is also provided.

The second chapter contains a comprehensive account of environmental provincial and national legislation promulgated before South Africa ratified the Convention on Biological Diversity in 1995. The signing of the Convention on Biological Diversity heralded a significant turning point in the development of

South African environmental legislation as various obligations set out in the CBD were thereafter translated into legally enforceable environmental laws.

The third chapter covers all the current national and provincial environmental legislation since South Africa ratified the CBD which also coincides with the ending of Apartheid and the establishment of a new democratic state. Particular attention is placed on the key role that NEMBA has played in assisting South Africa in achieving its goals and obligations as set out in the CBD.

According to South African legislation, there are many environmental management tools available to authorities to assist in conserving and managing biodiversity. The fourth chapter is an appraisal of one of these tools: the listing of threatened species approach. The evolution of the IUCN Red List of Threatened Species together with how these lists have influenced and informed the development of the Red Data Lists regionally and nationally are assessed. How the Threatened Species Lists (TSLs) are currently being used as a legal instrument to protect and conserve South Africa's biodiversity is also discussed.

Chapter five is a critical assessment of the listing of threatened species approach in the South African context. Benefits and shortcomings of the Red Data Lists and the Threatened or Protected Species list (ToPS) are put forward. The final chapter provides concluding remarks together with some recommendations on how this approach may be improved.

Chapter 2: South African Biodiversity Legislation pre-1995

This chapter provides an historical overview of the national and provincial legislation that dealt with biodiversity protection and conservation before South Africa ratified the Convention on Biological Diversity in 1995.

2.1 Provincial Legislation

In South Africa there exists a superfluous amount of provincial environmental legislation available today due to the accumulation of fragmented and uncoordinated environmental legislation which is a result of, amongst others, colonial rule and the establishment of the homeland system.[65] This view is also held by other commentators including Kidd.[66] The large quantity of legislation discussed in this chapter confirms and substantiates this point of view.

In the past, the concept of nature conservation was limited to the proclamation of protected areas and the preservation of indigenous fauna and flora in South Africa. The purpose of environmental legislation at the time was to facilitate resources allocation and exploitation and not to conserve and protect biodiversity. The allocation and exploitation of resources was expressly a provincial competence[67]and leading up to 1994 no national legal framework was in place for biodiversity regulation in South Africa.[68] Thus, the issue of nature conservation was decentralised and placed under the jurisdiction of the provincial authorities within the four provinces at that time, which were: Transvaal, Orange Free State, Natal and the Cape Province. With biodiversity regulation under the control of the provinces, the promulgation of provincial conservation legislation and the formulation of provincial conservation organisations were established.

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[65] Nel JG & Du Plessis W. 'An Evaluation of NEMA based on a Generic Framework for Environmental Framework Legislation' (2001) *SAJELP* Vol 8 No 1 page 2.
[66] Kidd, op cit page 91
[67] Glazewski, op cit page 365.
[68] Paterson et al (2009), op cit page 70.

Some of the provincial legislation and conservation institutions are still in existence today and their jurisdiction now falls within the newly identified provinces as set out in Table 1 below.

Table 1: Former and Current Provincial Structures

Former Provincial Structure	**Current Provincial Structure**
Cape Province	Western Cape Province Eastern Cape Province Northern Cape Province
Natal Province	KwaZulu-Natal Province
Orange Free State Province	Free State Province
Transvaal Province	Gauteng Province Mpumalanga Province Limpopo Province North-West Province

The four provincial administrations promulgated ordinances to regulate hunting, private reserves, fauna and flora, professional hunters and hunting outfitters.[69] These ordinances were titled: Natal Nature Conservation Ordinance 15 of 1974; Orange Free State Nature Conservation Ordinance 8 of 1969; Cape Nature and Environmental Conservation Ordinance 19 of 1974; and Transvaal Nature Conservation Ordinance 12 of 1983. The main purpose of the provincial ordinances was to regulate the hunting of game in their respective provinces which they aimed to do by setting up a licencing system, by providing different degrees of protection according to categories in which game were been placed, establishing open and closed hunting seasons, and identifying prohibited hunting measures.

[69] Kidd, op cit page 91.

As no national legislation existed at the time that dealt specifically with nature conservation and since South Africa had ratified the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975 and had agreed to abide by the Articles of the Convention, the provincial nature conservation ordinances later became the legislative tool in which South Africa was able to carry out its CITES obligations such regulating trade and the protection of species. The main aim of the ordinances at that time was, however, the protection of indigenous species and domestic conservation matters as they pre-dated CITES.[70]

The four provincial nature conservation ordinances all follow a similar format and approach. Apart from the fact that they all established provincial nature reserves in their provinces, they also focused on protecting and controlling individual species of fauna and flora that are found outside protected areas, rather than ecosystems.[71] Moreover, they all used a listing approach as a legal instrument for biodiversity conservation within their respective areas of jurisdiction. The listing approach utilized in the Ordinances followed in a similar vein as IUCN classification system where schedules were set up that consist of lists of species of mammal, reptile and amphibian, plants, birds, freshwater fish, and in some cases invertebrates (such as insects). However, the terminology used by the ordinances differed to that used by the IUCN classification system. Terms such as 'threatened' or 'endangered' were replaced by terms such as 'ordinary game', 'protected game' and 'specially protected game'.

During the pre-1994 period, the apartheid government had also established four 'independent homeland' states. These states were known collectively as the 'TBVC states' and were made up of the Transkei, Bophuthatswana, Venda and Ciskei. In addition to the four nature conservation ordinances that fell under the provincial administrations, the TBVC states and self governing territories also

[70] Ashish Bodasing & Teresa A Mullikan. Traffic 'South Africa's Wildlife Trade at the Crossroads' 1996. Traffic East/Southern Africa. Endangered Wildlife Trust. Page 10
[71] Glazewski, op cit page 375.

had their own nature conservation legislation.[72] In total, thirteen pieces of legislation dealing with nature conservation in South Africa were in place before the new political dispensation came about in 1994.

The provincial nature conservation Ordinances are discussed separately and in greater detail below.

2.1.1 Orange Free State Nature Conservation Ordinance

The Orange Free State Nature Conservation Ordinance 8 of 1969 consists of six schedules: protected game; ordinary game; specified wild animals; exotic animals; aquatic plants and protected plants. Both the common name and scientific name is provided for each species. Species identified under the different schedules require different levels of protection. Protected game may only be hunted where a permit has been granted,[73] the hunting of ordinary game is only permitted during proclaimed hunting seasons set by the Administrator and where a permit has been authorised.[74] It is prohibited to own a live specified wild animal[75] or exotic animal or to possess, buy, sell, grant, exchange, process or manufacture any product from any part of the body of a wild or exotic animal species[76] without a permit. However, the Administrator may, in certain cases, grant a permit for the hunting of a wild or exotic animal.[77] With regard to aquatic plants and protected plants, it is prohibited cultivate, possess, convey, import, sell or dispose of any aquatic plants[78] or to pick any protected plant[79] without the granting of a permit.

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[72] Some of these include: Bophuthatswana Nature Conservation Act, 3 Of 1973; Nature Conservation Act, 10 of 1987 (Ciskei); Environment Conservation Decree 9 (Transkei) of 1992; Lebowa Nature Conservation Act, 10 LB of 1973; Qwaqwa Nature Conservation Act, 5 of 1976; KwaZulu Nature Conservation Act, 8 of 1975.
[73] Section 2(3) of the Ordinance.
[74] Sections 4 and 5 of the Ordinance.
[75] All elephants and all rhinoceroses.
[76] Sections 14, 15 and 16 of the Ordinance, respectively.
[77] Section 17 of the Ordinance.
[78] Section 29 of the Ordinance.
[79] Section 30(3) of the Ordinance.

There is an added schedule that deals with hunting at night and details those mammals that may be hunted at night where a permit is not required.[80] The Ordinance also establishes provincial nature reserves[81] declared by the Administrator and private nature reserves declared as such upon successful application by the owner of the land.[82] The hunting of problem animals is also provided for in Chapter VA of the Ordinance where a permit may be granted by the Administrator to a person to hunt a problem animal.

At the time of writing, this Ordinance is still in existence and is assigned to the Free State Province.

2.1.2 Natal Nature Conservation Ordinance

The Natal Nature Conservation Ordinance 15 of 1974 contains Chapters III to XI that regulates the following: game; private reserves; mammals; professional hunters and hunting outfitters; amphibians, invertebrates and reptiles; wild birds; freshwater fish; coastal fishing; and indigenous plants. The Ordinance's primary role was to regulate the hunting of game by using a combination of a licence system, categorising game into specific lists which provided different degrees of protection, determining open and closed seasons and prohibiting certain hunting measures.[83] The Ordinance deals predominantly with species that occur outside of protected areas as the hunting of these species within protected areas is prohibited.

The Ordinance contains the following Schedules which provide different levels of protection:

- Schedule 1: Ordinary Game

[80] Section 6 of the Ordinance.
[81] Section 35 of the Ordinance.
[82] Section 36 of the Ordinance.
[83] Kidd, op cit page 91.

- Schedule 2: Protected Game
- Schedule 3: Specially Protected Game
- Schedule 4: Open Game
- Schedule 5: Mammals excluded from definition of indigenous mammal
- Schedule 6: Endangered Mammals
- Schedule 7: Protected Amphibians, Invertebrates and Reptiles
- Schedule 8: Unprotected Wild Birds
- Schedule 9: Specially Protected Birds
- Schedule 10: Unprotected Indigenous Plants
- Schedule 11: Protected Indigenous Plants
- Schedule 12: Specially Protected Indigenous Plants
- Schedule 12A: Fauna and Flora
- Schedule 13: Repealed Ordinances.

The Ordinance was amended in 1993 to introduce a new schedule that would contain Appendix I and II species contained in CITES. A summary of the IUCN Threatened Species List was included instead by mistake which fortuitously strengthened the Ordinance's support for the CITES Convention. The error does, however, cause confusion as some species were now listed in more than one schedule.[84] The Ordinance also establishes commercial game reserves; game parks; game reserves; national parks; nature reserves; private nature reserves and private wildlife reserves.[85]

Despite the KwaZulu-Natal province promulgating the KwaZulu-Nature Conservation Management Act, 9 of 1997, this Ordinance is still in effect.

2.1.3 Cape Nature and Environment Conservation Ordinance

Included in the Cape Nature and Environmental Conservation Ordinance 19 of 1974 are five schedules which list endangered wild animals; protected wild

[84] Bodasing & Mullikan, op cit page 10.
[85] All defined under Section 1 of the Ordinance.

animals (including the class *Insecta*); endangered flora; protected flora; and noxious aquatic growths. The Ordinance also establishes provincial nature reserves,[86] local nature reserves,[87] and private nature reserves.[88] The hunting of endangered wild animals and protected wild animals is prohibited without a permit[89] and in the case of protected wild animals, during the prescribed hunting season.

Before 1994, the Cape Nature and Environment Conservation Ordinance had jurisdiction over the area covered today by the Eastern, Northern and Western Cape Provinces. Today, its trade provisions exceed those provisions of CITES as import permits are required for all live wild animal species (even those from other provinces) as well as trophies from countries other than South Africa regardless of where the species stand on the CITES Appendices.[90]

2.1.4 Transvaal Nature Conservation Ordinance

The Transvaal Nature Conservation Ordinance 12 of 1983 was the only provincial ordinance that was promulgated after South Africa had ratified CITES and covers the provincial areas today known as Gauteng, Limpopo, North-West and Mpumalanga. The Ordinance establishes nature reserves[91] as declared by the Administrator and by *Provincial Gazette*.

The Ordinance contains the following Schedules:

- Schedule 1: Repealed Ordinances
- Schedule 2: Protected Game
    - A: Reptiles and Mammals
    - B: Birds

[86] Section 6 of the Ordinance.
[87] Section 7 of the Ordinance.
[88] Section 12 of the Ordinance.
[89] Sections 26 and 27 of the Ordinance, respectively.
[90] Bodasing & Mullikan, op cit page 10.
[91] Section 14 of the Ordinance.

- Schedule 2A: Specially Protected Game
- Schedule 3: Ordinary Game
- Schedule 4: Protected Wild Animals
- Schedule 5: Wild Animals to which the Provisions of Section 43 apply
- Schedule 6: Exotic Animals to which the Provisions of Section 44 apply
- Schedule 7: Invertebrata
- Schedule 8: Problem Animals
- Schedule 9: Troutwaters
- Schedule 10: Prohibited Aquatic Growths
- Schedule 11: Protected Plants
- Schedule 12: Specially Protected Plants.

The Transvaal Ordinance is not only protectionist as it also deals with problem animals (Section 56 and Schedule 8) and prohibited aquatic growths that ideally need to be eradicated such as parrots feather (*Myriophyllum aquaticum*) and water hyacinth (*Eichornia crassipes*) contained in Schedule 10. Prohibited aquatic growths may not be imported into the province without a permit having been issued.[92]

2.1.5 Critical assessment of the Provincial nature conservation legislation

The four provincial nature conservation ordinances are similar as they all aim to protect the species listed in their respective schedules. From the outset it was clear that the provinces followed a species by species approach to conservation rather than an ecosystem approach. Schedules contained in the various provincial laws listed species according to the level of protection they required. Categories included: 'specially protected game'; 'protected game'; 'ordinary game'; 'specially protected plants'; 'protected plants. Undesirable species were also categorised and included: 'prohibited aquatic growths'; 'problem animals'; and 'exotic species'. Another common link between the provinces was that they

[92] Section 85 of the Ordinance.

utilised the permit or licence system to regulate all activities involving wild animals inside and outside protected areas. Generally, permits were required for hunting, importing, exporting, transporting, selling, buying and collecting specimens of listed species. Each province also imposed restrictions on the types of weapons that may be used for hunting game and also prohibited hunting and catching species using poison, snares and traps, amongst others.

However, inconsistencies did exist between them. These inconsistencies were associated with the terminology used, specific trade controls, species coverage, offences and the penalties associated with those offences.[93] In many cases these inconsistencies caused confusion and allowed for 'loopholes' to be found which in turn allowed for greater transgressions of the law to take place. This undermined the effectiveness of the legislation.

Kidd[94] used the example of the wild dog to illustrate how this occurs: The wild dog (*Lycaon pictus*) is categorised as 'specially protected' in the Natal Ordinance, 'protected' in the Transvaal Ordinance, but is not mentioned in either the Orange Free State or the Cape Ordinances. This means that within the Natal and Transvaal Provinces a permit is required to hunt the wild dog, however, in the other two provinces the wild dog may be hunted without a permit. Thus, great inconsistencies in species coverage exist between provincial lists where a species well protected in one province may not be protected at all in other, or one species may be offered greater protection in one province and very little protection in another province. This was often the case with problem animals as the definition of a 'problem animal' varied between provinces. This lack of uniformity resulted in a lack of protection afforded to the very species that required it.

[93] Bodasing & Mullikan, op cit page 11.
[94] Kidd, op cit page 117.

Another case in point was that of the stag beetle (*Colophon* spp.), an indigenous species to South Africa.[95] This insect is endemic to the Cape Province and is fully protected under the Cape Ordinance. Permits are required to collect, possess or export stag beetles in the Cape Province. This is, however, not the case in the other three provinces where stag beetles can be possessed or exported without a permit. It has since been proposed that this species be included in Appendix III of CITES but this is yet to be done. Appendix III species are only partially covered in some of the provincial ordinances and whilst others contain no provisions for Appendix III species at all (Cape Province). The exclusion of CITES Appendix III species from the provincial ordinances directly contravenes Article V of the Convention.[96]

Inconsistent species trade controls also allowed for 'province hopping' where an importer may import a species into a province that does not require a permit for that species and then simply acquire a transport permit to transport that species to a province that had originally required an import permit be issued for that species. This was the case when a Saker Falcon (*Falco cherrug*) was to be imported into South Africa and the CITES Scientific Authority rejected the application. The importer simply used a different individual to make the same application for the same falcon whereupon the application was successful. When the falcon arrived in the Orange Free State the falcon was handed over to the original applicant who then applied to the Cape Authorities for a transport permit for the falcon to be transported to the Cape. The permit was granted. This example illustrates how the species trade controls in South Africa were easily circumvented.[97]

Another shortcoming of the Ordinances was that the terminology used between the provincial ordinances is not consistent. All the ordinances used the category 'game' except for the Cape Ordinance. Perhaps this was because hunting was

[95] Bodasing & Mullikan, op cit page 12.
[96] Bodasing & Mullikan, op cit page 11.
[97] Bodasing & Mullikan, op cit page 13.

not a major phenomenon in the Cape Province (although it is a lucrative business in the Eastern Cape).[98] The differences in terminology can complicate the protection of species as those species covered in one schedule may not be as well protected as those listed in another schedule. Apart from the Cape Ordinance, the terminology used in the other three ordinances differed to that used in the CITES Appendix I and II species lists. This weakened the impact of CITES and causes confusion amongst the Ordinances.

Penalties, imposed by each provincial Ordinance for transgressions of the law, were also inconsistent between the provinces. Greater consistency was required between the provincial Ordinances on the penalties imposed for the same offence. For example: Any person convicted for hunting an African elephant (*Loxodonta africana*) in the Cape Province will have to pay a fine not exceeding one hundred thousand rand or to imprisonment for a period not exceeding ten years or to both the fine and imprisonment *plus* to a fine not exceeding three times the commercial value of any African elephant.[99] The same offence committed in the Orange Free State carried the same penalty excluding the additional fine of three times the commercial value of the African elephant.[100] Furthermore, in some cases such as in the Transvaal, it was not clear which penalty should prevail where species were found within the indigenous and native listing as well as within the CITES listings.[101]

When the new political dispensation was established the number of provinces was increased from four to nine and most of the provinces retained their pre-1994 nature conservation legislation. With the retention of the provincial Ordinances and the legislation from the TBVC states and self-governing states still in place, many of the newly established provinces found themselves governed by more than one piece of legislation regarding nature conservation.

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[98] Glazewski, op cit page 376.
[99] Section 86(1)(b) of the Cape Ordinance.
[100] Section 40(1)(a)(i).
[101] Bodasing & Mullikan, op cit page 15.

This situation resulted in confusion and a fragmented system of environmental laws.

This section has illustrated the fragmented and dysfunctional array of provincial legislation that desperately needed to be replaced with a more centralised, national model for the protection and conservation South Africa's biodiversity. There also existed a need for environmental laws to be brought into line with the requirements of CITES and the CBD. Fortunately, with NEMPAA and NEMBA having been passed and together with the subsequent promulgation of the ToPS Regulations, any provincial provisions are superseded and provincial authorities are encouraged to revise their provincial legislation in order to be brought in line with national requirements and the national ToPS List.

2.2 National Legislation

The majority of the national legislation that existed before the ratification of the CBD and the establishment of the new dispensation in South Africa, that pertains to the conservation and protection of biodiversity, has since either been partly or entirely repealed.

In the past, it was the purpose of the National Parks Act 57 of 1976 to regulate the control, management and maintenance of national parks in South Africa. This Act has now largely been repealed by the National Environmental Management: Protected Areas Act 57 of 2003 (NEMPAA). All that remains of the former Act is section 2(1) and Schedule 1 which provides for the defined area of the existing 22 national parks in South Africa. National Parks are currently proclaimed and administered under NEMPAA. Before the Act was repealed it was one of two Acts[102] that dealt with the issue of mining in protected areas and

[102] Strydom & King, op cit page 574.

provided that it was an offence to prospect or mine on land that was considered to be part of a national park.[103]

The Environment Conservation Act 73 of 1989 (ECA) was South Africa's first environmental framework law. Although this Act adopted generic elements and definitions that were applicable to environmental law,[104] it only dealt with selected aspects of environmental conservation. According to the Long Title, the purpose of the Act was 'to provide for the effective protection and controlled utilization of the environment and for matters incidental thereto'. Before the Act was promulgated, the Bill contained a provision that every person was entitled to a clean and healthy environment.[105] Although, this provision was excluded from the final version, the Constitution of the Republic of South Africa of 1996 rectified this as we now have an environmental right included in the Bill of Rights. NEMA gives effect to this environmental right and has repealed large parts of the ECA and replaced it as the environmental framework law in South Africa.

[103] Sections 20 and 24(8) of the Act.
[104] Strydom & King, op cit page 4.
[105] Strydom & King, op cit page 196.

Chapter 3: South African Biodiversity Legislation post-1995

This chapter is a discussion on the national and provincial legislation that currently deals with biodiversity protection and conservation in the South African context. The chapter begins with an examination of the international environmental laws that have influenced the development of South Africa's specific environmental management legislation since 1995.

3.1 Biodiversity Protection in the International Environmental Law Context

There exist a number of international laws that relate to environmental protection; however, this paper will only focus on two conventions that are relevant to biodiversity protection and conservation: the Convention on Biological Diversity and the Convention on the International Trade in Endangered Species of Wild Fauna and Flora.

3.1.1 Convention on the International Trade in Endangered Species of Wild Fauna and Flora

The 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) was prompted by a resolution of the IUCN in 1963 and came into force on 1 July 1975. Since its adoption, the Convention has been amended twice: at Bonn on 22 June 1979 and at Gaborone on 30 April 1983. The former amendment is currently in force but the latter amendment is not in force. South Africa ratified CITES on 15 July 1975.

According to the Preamble, the purpose of CITES is to through international cooperation ensure the protection of and survival of species of fauna and flora against overexploitation through international trade. This assists in ensuring the sustainability of trade in species and at the same time helps prevent the

extinction of species. Article 2 sets out the fundamental principles of the Convention and categorises species into Appendix I, II and III, according to the level of protection that they require. Species found in Appendix I are currently threatened with extinction and are to receive strict regulation. Trade in Appendix III species is only permitted in exceptional circumstances. Appendix II contains species that are not necessarily currently threatened with extinction but may become so unless trade in specimens of such species is subject to strict regulation. Appendix III includes species that any Party identifies as requiring regulation within its jurisdiction in order to prevent or restrict their exploitation and needs the cooperation of other parties in order to do so.

As stated above, the three appendices provide different degrees of protection and trade controls in each category. Articles III, IV and V of the Convention regulate trade in specimens of species included in Appendix I, II and III, respectively. The importing, exporting, re-exporting and introduction from the sea of specimens of species is controlled by a permitting or certificate system which is informed and advised by the relevant Scientific Authority and a Management Authority. Article VII allows for exemptions and other special provisions relating to trade to be issued (e.g. specimens in transit that are held in Customs control, animals bred in captivity, and specimens for scientific research).

3.1.2 Convention on Biological Diversity

The 1992 Convention on Biological Diversity (CBD) had been under negotiation since 1988 and was established due to international concern over the disappearance of species and habitats. The Convention was negotiated under the auspices of the UNEP of the Convention on Biodiversity and came into effect on 29 December 1993. South Africa became a party when it ratified the CBD on 2 November 1995.

According to the Preamble of the Convention '... a fundamental requirement for the conservation of biodiversity is the *in-situ*[106] conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings.' This conservation objective is linked to '*in-situ* conditions' which means 'conditions where genetic resources exist within ecosystems and natural habitats, and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties'.[107] The Convention also provides for *ex-situ* conservation which means 'the conservation of components of biological diversity outside their natural habitats'.[108] Examples of *ex-situ* conservation are species held captive in zoos and held for captive breeding purposes.

According to Article 1, three main objectives of the Convention are '...the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources....' Although the approach of the Convention is focused on conservation and the sustainable use of natural resources, its goals are expressed in very broad terms and it fails to set specific targets. Unfortunately, the Convention would not have been concluded if requirements were not set in broad terms as many States were reluctant to commit to specifically set targets.[109] Another criticism of the Convention is that it recognizes the right of a sovereign State to exploit its own resources pursuant to their own environmental policies, and relies on each State to ensure that activities within their jurisdiction do not cause transboundary environmental damage or damage to other areas beyond their national jurisdiction.[110]

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[106] *In-situ* conservation is defined in Article 2 of the Convention as 'the conservation of ecosystems and natural habitats and the maintenance and recovery of viable populations of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties'.
[107] Defined in Article 2 of the Convention.
[108] Defined in Article 2 of the Convention.
[109] Patricia Birnie, Alan Boyle and Catherine Redgewell *International Law and the Environment* 3 ed (2009) Oxford University Press page 617.
[110] Article 3 of the Convention.

Article 6 deals with general measures for conservation and sustainable use. It states that each Party to the Convention shall develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity and integrate, as far as possible, the conservation and sustainable use of biological diversity into relevant sectoral plans, programmes and policies.

The duties of signatory states in regard to the protection of their biodiversity are set out in articles 8 and 9 of the CBD. Article 8 provides for *in-situ* conservation and lists a range of measures required to protect biodiversity: establishing protected areas; regulating and managing biological resources inside and outside protected areas; protecting ecosystems, natural habitats and maintaining species populations; promoting sustainable development in areas adjacent to protected areas; rehabilitating degraded ecosystems and promoting the recovery of threatened species; controlling the use and release of living modified organisms that may have a detrimental effect on the environment; controlling the introduction and eradicating alien species which threatened ecosystems, habitats or species; preserving and maintaining indigenous knowledge; and developing national legislation to protect threatened species and populations.

Article 9 of the Convention provides for *ex-situ* conservation and proposes that measures such as the establishment and management of facilities for *ex-situ* conservation and research should be adopted in the country of origin for the conservation of biological diversity. Furthermore, the collection of biological resources from natural habitats for *ex-situ* conservation purposes must not threaten ecosystems and *in-situ* population of species. Parties are required in cases of *in-situ* and *ex-situ* conservation to provide funding and support to for conservation measures to developing countries.[111]

The Convention also mentions that all Parties are to, as far as possible, carry out environmental impact assessments on proposed projects that are likely to have a

[111] Articles 8(m) and 9(e) of the Convention, respectively.

detrimental effect on the environment so as to avoid or minimise adverse effects.[112] Articles 15 and 16 regulate access to genetic resources by importing countries and the equitable transfer of technology to exporting countries, particularly developing countries. Articles 17 and 18 promote the exchange of information as well as promoting international technical and scientific cooperation in the field of conservation and the sustainable use of biological diversity. Article 19 provides for the subsequent elaboration of procedures to promote biosafety by addressing the potential risks to biosafety and human health from living modified organisms.

In October 2010 the tenth meeting of the Conference of the Parties to the Convention on Biological Diversity took place in Nagoya, Japan. The main purpose of this meeting was to assess progress in the 2010 Biodiversity Targets set in 2002 during the sixth Conference of the Parties meeting. The targets that were to be achieved in 2010 were 'a significant reduction in the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth.'[113] The results of the meeting concluded that the targets had not been met as biodiversity loss had increased. Consequently, a new set of post-2010 biodiversity targets were adopted for 2020. The 20 targets that have been adopted include:

- halving the loss and degradation of forests and other natural habitats;
- eliminating overfishing and destructive fishing practices;
- sustainably managing all areas under agriculture, aquaculture and forestry;
- bringing pollution from excess nutrients and other sources below critical ecosystem loads;
- controlling pathways introducing and establishing invasive alien species;
- managing multiple pressures on coral reefs and other vulnerable ecosystems affected by climate change and ocean acidification;

[112] Article 14 of the Convention.
[113] http://www.iucn.org/iyb/iucn/convention_on_biological_diversity/ accessed 13 September 2011.

- effectively protecting at least 15 per cent of land and sea, including the areas of particular importance for biodiversity; and
- preventing the extinction of known threatened species.[114]

The new set of targets is seemingly ambitious and it will be interesting to see if parties are willing and able to achieve them.

The next section discusses current environmental legislation and explains how the ratification of the CBD has influenced and informed the development of specific environmental management laws in South Africa. The section begins with the most important Act regarding biodiversity, the National Environmental Management: Biodiversity Act.

3.2 National Legislation

3.2.1 National Environmental Management: Biodiversity Act

The adoption of NEMBA was in direct response to the CBD and is a significant achievement in South African environmental law as it represents a 'nationally agreed approach to biodiversity management and conservation that has legal status.'[115]

Despite the Act having taken several years to be enacted, it was a national response to fragmented laws governing biodiversity and now provisions contained in the Act contribute positively to a well developed policy and legislative framework for biodiversity conservation in South Africa. The objectives of the Act are:

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[114] http://www.iucn.org/cbd/meetings/nagoya_2010/news/opinion/?6131/time-to-think-big accessed 13 September 2011.

[115] Cadman M, Petersen C, Driver A, Sekhran N, Maze K and Munzhedzi S 'Biodiversity for Development: South Africa's landscape approach to conserving biodiversity and promoting ecosystem resilience' (2010) South African National Biodiversity Institute, Pretoria page 31.

(a) within the framework of the National Environmental Management Act, to provide for-
    (i) the management and conservation of biological diversity within the Republic and of the components of such biological diversity;
    (ii) the use of indigenous biological resources in a sustainable manner; and
    (iii) the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;
(b) to give effect to ratified international agreements relating to biodiversity which are binding on the Republic;
(c) to provide for co-operative governance in biodiversity management and conservation; and
(d) to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.[116]

The objectives of the Act are echoed in the Long Title of the Act and are premised on the objectives contained in the CBD, to which the Act is to give effect.[117] The Act must also be read with any other applicable provisions of the NEMA and particularly in conjunction with the national environmental management principles contained in section 2 of NEMA.[118] The State is tasked, through its organs, with managing, conserving and sustaining biodiversity, its components and genetic resources in South Africa.[119]

The Act has substantially changed the laws governing biodiversity in South Africa starting with replacing the National Botanical Institute (NBI) that had been established under the now repealed Forest Act, 122 of 1984, with the South African National Biodiversity Institute (SANBI). The Act greatly increases the

[116] Section 2 of NEMBA.
[117] Article 1 of CBD: 'The objectives of this Convention, to be pursued in accordance with its relevant provisions, are the conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.'
[118] Sections 6(1) and 7 of NEMBA.
[119] Section 3 of NEMBA.

responsibilities of SANBI compared to those of its predecessor, the NBI. Of particular note is that the management and control of both flora and fauna now fall under the ambit of SANBI as compared to just dealing with flora under NBI. Other responsibilities of SANBI is that of carrying out biodiversity education; research in indigenous, naturalised and alien flora in South and southern Africa; and ensuring that biodiversity knowledge influences policy, management and decision-making.[120] SANBI is also obliged to monitor and report to the Minister on the status of South Africa's biodiversity as well as the conservation status of all listed threatened or protected species and listed ecosystems and the status of all listed invasive species.[121]

Other functions entrusted to SANBI include, amongst others, that it must monitor and report regularly to the Minister on the environmental impacts associated with all categories of GMOs, post commercial release, and the risks involved; must manage all national botanical gardens; and must collect, disseminate and maintain databases regarding the sustainable use of indigenous biological resources.[122]

Chapter 3 of the Act deals with the planning and monitoring of biodiversity which is aims to achieve by providing integrated and coordinated biodiversity planning, monitoring the conservation status of various components, and promoting biodiversity research.[123] Biodiversity planning is to be carried out through the construction and implementation of three planning instruments: a national biodiversity framework, bioregion and bioregional plans, and biodiversity management plans and agreements. The Minister of Environmental Affairs and Tourism has published the Guidelines regarding the Determination of Bioregions and the Preparation of and publication of Bioregional Plans,[124] and Norms and

[120] http://www.sanbi.org/index.php?option=com_content&view=article&id=1&Itemid=135. Accessed 28 June 2011.
[121] Section 11(a) of NEMBA.
[122] Sections 11(b), (e) and (j) of NEMBA, respectively.
[123] Section 37 of NEMBA.
[124] Government Notice 291 in *Government Gazette* 32006 dated 16 March 2009.

Standards for Biodiversity Management Plans for Species.[125] The Minister is also obligated to promote research on biodiversity conservation carried out by SANBI and any other institutions.[126]

Chapter 4 of the Act deals with threatened or protected ecosystems and species and the purpose of this chapter is to

(a) provide for the protection of ecosystems that are threatened or in need of protection to ensure the maintenance of their ecological integrity;
(b) provide for the protection of species that are threatened or in need of protection to ensure their survival in the wild;
(c) give effect to the Republic's obligations under international agreements regulating international trade in specimens of endangered species; and
(d) ensure that the utilisation of biodiversity is managed in an ecologically sustainable way.[127]

The Act endorses the listing approach to identifying ecosystems and species that require varying degrees of protection depending on classification criteria. In terms of ecosystems that are threatened or are in need of protection, the Minister and Member of the Executive Council (MEC) of the relevant province are tasked with publishing a national or provincial list of ecosystems that are threatened or in need of protection.[128] Four categories have been identified: critically endangered ecosystems; endangered ecosystems; vulnerable ecosystems; and protected ecosystems.[129] At the time of writing, the Minister had only published a draft

[125] Government Notice R.214 in *Government Gazette* 31968 dated 2 March 2009.
[126] Section 50 of NEMBA.
[127] Section 51 of NEMBA.
[128] Sections 51(1)(a) and (b) of NEMBA, respectively.
[129] Section 52(2) of NEMBA defines the categories as
(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

national list of terrestrial ecosystems that are threatened and in need of protection.[130] The Minister is also empowered to identify any process or activity in a listed ecosystem that is a threatening process as contemplated in section 24(2)(b) of NEMA.[131]

The protection of threatened or protected species is dealt with in Part 2 of Chapter 4 and, as with threatened and protected ecosystems, the Minister may publish a list of critically endangered species; endangered species; vulnerable species; and protected species according to their scientific name and their common name.[132] The Minister has since carried out his mandate and published a final list[133] that must be reviewed at least every five years.[134] In addition to the publication of species lists, NEMBA also prohibits any person from carrying out a restricted activity involving a specimen of a listed threatened or protected species without a permit that has been issued in terms of Chapter 7 of NEMBA.[135] This prohibition is regulated by the Threatened or Protected Species (ToPS) Regulations[136] as they aim to

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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).

[130] General Notice 1477 in *Government Gazette* 32689 dated 6 November 2009.

[131] Section 53 of NEMBA.

[132] Section 56(1) of NEMBA defines the categories as

(a) critically endangered species, being any indigenous species facing an extremely high risk of extinction in the wild in the immediate future;

(b) endangered species, being any indigenous species facing a high risk of extinction in the wild in the near future, although they are not a critically endangered species;

(c) vulnerable species, being any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future, although they are not a critically endangered species or an endangered species; and

(d) protected species, being any species which are of such high conservation value or national importance that they require national protection, although they are not listed in terms of paragraph (a), (b) or (c).

[133] Government Notice R.151 in *Government Gazette* 29657 dated 23 February 2007.

[134] Section 56(2) of NEMBA.

[135] Section 57(1) of NEMBA.

[136] Government Notice R.152 in *Government Gazette* 29657 dated 23 February 2007.

(a) further regulate the permit system set out in Chapter 7 of the Biodiversity Act insofar as that system applies to restricted activities involving specimens of listed threatened or protected species;
(b) provide for the registration of captive breeding operations, commercial exhibition facilities, game farms, nurseries, scientific institutions, sanctuaries and rehabilitation facilities and wildlife traders;
(c) provide for the regulation of the carrying out of a specific restricted activity, namely hunting;
(d) provide for the prohibition of specific restricted activities involving specific listed threatened or protected species;
(e) provide for the protection of wild populations of listed threatened species; and
(f) provide for the composition and operating procedure of the Scientific Authority.[137]

Historically, the function of nature conservation has been assigned to provincial authorities. However, in terms of the Constitution of South Africa 1996, nature conservation is now a concurrent competency assigned to both national and provincial government[138] with the ToPS Regulations required to be implemented at the level of the provinces by the provincial conservation authorities or departments. The ToPS Regulations assist in species-based conservation as it is these Regulations that guide the implementation of the permit system for those who require a permit and apply for permission to carry out a restricted activity involving a specimen of a listed threatened or protected species.

Whilst, the ToPS Regulations include factors to be taken into account when considering permit applications, they also prohibit certain methods of hunting involving listed threatened or protected species.[139] Prohibited hunting methods include, amongst others, the use of poison, traps or snares, as well as certain

[137] Regulation 2 of ToPS Regulations.
[138] Schedule 4 Part A.
[139] Regulation 26 of ToPS Regulations.

types of weapons, unless it is for the management of damage causing animal.[140] Recently, with regard to the acceptable hunting methods, the Minister of Water and Environmental Affairs published the National Norms and Standards for Hunting Methods in South Africa.[141] The Norms and Standards aim to ensure that minimum requirements for hunting methods are standardised and to ensure ecological sustainable utilization of natural resources by maintaining viable populations of indigenous species and their environments.[142]

It appears, albeit on paper, as though the national Government is serious about curtailing the impact of restricted activities on listed threatened or protected species. This is evidenced by a recent amendment to the ToPS Regulations[143] which dramatically increases the penalties on a person who is committed of an offence in terms of section 73 of the Regulations to imprisonment for a period not exceeding five years or to a fine not exceeding R5 million, or to both (and in the case of a second or subsequent conviction to a fine not exceeding R10 million or to imprisonment not exceeding 10 years, or both).[144] In August 2011, the Minister also proposed substantial amendments to NEMA and NEMBA. [145] It is proposed that section 28A dealing with criminal liability is inserted into NEMA prohibiting an unlawful and intentional or negligent action that results or is likely to result in the pollution or degradation of the environment. Substantial fines are to be imposed should anyone be found guilty of contravening section 28A. In

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[140] Regulation 1 of ToPS Regulations define 'damage causing animal' as

> an individual of a listed threatened or protected species that, when interacting with human activities, there is substantial proof that it -
> (a) causes losses to stock or to other wild specimens;
> (b) causes excessive damage to cultivated trees, crops, natural flora or other property;
> (c) presents a threat to human life; or
> (d) is present in such numbers that agricultural grazing is materially depleted;

See also the Draft Norms and Standards for the Management of Damage-Causing Animals in South Africa as contained in General Notice 1084 of 2010 published in *Government Gazette* 33806 dated 26 November 2010.

[141] Government Notice 456 in *Government Gazette* 34326 dated 27 May 2011.

[142] Sections 2 and 3, respectively, of the National Norms and Standards for Hunting Methods in South Africa, 2011.

[143] Government Notice R.576 in *Government Gazette* 34453 dated 11 July 2011.

[144] Regulation 74 of ToPS Regulations.

[145] National Environmental Management Laws Amendment Bill, 2011, as contained in General Notice 586 of 2011 published in Government Gazette 34558 dated 26 August 2011.

terms of NEMBA, the proposed amendments provide, amongst others, that section 57 be amended as follows

> (1) A person may not carry out a restricted activity involving a specimen of a listed threatened or protected species or a species to which an international agreement regulating international trade applies without a permit issued in terms of Chapter 7;[146]

It will no longer be permitted for a person to carry out a restricted activity involving a species whose trade is protected in terms of an international agreement (such as CITES) as these species are to be protected under NEMBA. The proposed amendment will go a long way in regulating international trade in threatened and protected species provided that it is adequately implemented and enforced.

Part 3 of Chapter 4 provides for trade in listed threatened or protected species and seeks to give effect to CITES. Section 60 of the Act establishes a scientific authority which is essentially a CITES secretariat whose role is to aid the regulation and control of trade in listed threatened and protected species in South Africa. Additionally, the Minister of Water and Environmental Affairs has promulgated CITES Regulations, 2010,[147] which deal with the import, export, or re-export of all plants and animal species listed on Schedules I, II and III attached to the Regulations.[148] The Regulations identify the duties of the National Management Authority and the Scientific Authority, where the former is responsible for considering and granting permits and certificates relating to the import, export and re-export of any species listed in the attached Schedules,[149]

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[146] Section 23 of the National Environmental Management Laws Amendment Bill, 2011. The words that have been underlined indicate that it is proposed that they are to be included in the Act.
[147] Government Notice R.173 in *Government Gazette* 33002 dated 5 March 2010.
[148] Schedules I, II and III of the Regulations list all species included in Appendix I, II and III of CITES, respectively.
[149] Regulation 3 of CITES Regulations, 2010.

amongst other matters, and where the latter is to advise and assist the Management Authority in its decision making.[150]

As mentioned in Chapter 1 of this paper, one of the greatest threats to biodiversity is alien[151] and invasive species[152]. Hence, an entire chapter in NEMBA has been allocated to combating alien and invasive species, the purpose of which is

(a) to prevent the unauthorized introduction and spread of alien species and invasive species to ecosystems and habitats where they do not naturally occur;
(b) to manage and control alien species and invasive species to prevent or minimize harm to the environment and to biodiversity in particular;
(c) to eradicate alien species and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats; and
(d) to ensure that environmental assessments for purposes of permits in terms of the Genetically Modified Organisms Act, 1997 (Act No. 15 of 1997), are conducted in appropriate cases in accordance with Chapter 5 of the National Environmental Management Act.[153]

The Act uses a permitting scheme to prevent the introduction into South Africa of alien species and to control and manage those that have already been introduced. A person who wishes to undertake a restricted activity involving an alien or listed invasive species is required to first obtain a permit. A permit may

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[150] Regulation 4 of CITES Regulations, 2010.
[151] Section 1 of NEMBA defines "alien species" as
(a) a species that is not an indigenous species; or
(b) an indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.
[152] Section 1 of NEMBA defines "invasive species" as any species whose establishment and spread outside of its natural distribution range-
(a) threaten ecosystems, habitats or other species or have demonstrable potential to threaten ecosystems, habitats or other species; and
(b) may result in economic or environmental harm or harm to human health.
[153] Section 64 of NEMBA.

only be issued after the risks and potential impact the restricted activity may have on biodiversity has been assessed.[154]

A 'restricted activity' is defined in terms of the Act as

> (b) in relation to a specimen of an alien species or listed invasive species, means-
>
> (i) importing into the Republic, including introducing from the sea, any specimen of an alien or listed invasive species;
>
> (ii) having in possession or exercising physical control over any specimen of an alien or listed invasive species;
>
> (iii) growing, breeding or in any other way propagating any specimen of an alien or listed invasive species, or causing it to multiply;
>
> (iv) conveying, moving or otherwise translocating any specimen of an alien or listed invasive species;
>
> (v) selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of an alien or listed invasive species; or
>
> (vi) any other prescribed activity which involves a specimen of an alien or listed invasive species.[155]

The Minister is empowered, by notice in the *Gazette*,[156] to exempt any alien species specified in the notice or any alien species of a category specified in the notice from requiring a permit.[157] Furthermore, the Minister may publish a list[158] of those alien species where a permit may not be issued and where a person may not carry out any restricted activity involving a specimen of an alien

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[154] Sections 65 and 71 of NEMBA, respectively.
[155] Section 1 of NEMBA.
[156] A list has been published in draft form in General Notice 348 of 2009 in *Government Gazette* 32090 dated 3 April 2009.
[157] Section 66 of NEMBA.
[158] A list has been published in draft form in General Notice 349 of 2009 in *Government Gazette* 32090 dated 3 April 2009.

species.[159] The Minister is obligated to publish a list of invasive species[160] that require various degrees of control, nationally and provincially.[161]

A duty of care is placed on the permit holder carrying out a restricted activity involving a specimen of an alien species.[162] The permit holder is required to comply with all conditions attached to the permit and to take all required steps to prevent or minimise harm to biodiversity. A similar duty of care is placed on a permit holder carrying out a restricted activity involving a specimen of a listed invasive species, but in addition the owner of land on which the listed invasive species occurs must notify the relevant authority of the its occurrence on that land and take steps to control and eradicate the listed invasive species and prevent it from further spreading.[163] Section 75 of the Act emphasises the need to ensure that the control and eradication of listed invasive species is carried out in an appropriate and cautious manner so as not to cause further harm and damage to the environment and biodiversity.

Genetically Modified Organisms are also considered to be a threat to biodiversity and are dealt with in to a minor extent in this chapter.[164] NEMBA stipulates that if the Minister believes that the release of a GMO into the environment under a permit issued by the Genetically Modified Organisms Act 15 of 1997 may pose a threat to any indigenous species or environment, then no permit may be issued unless an EIA has first been conducted in terms of Chapter 5 of NEMA.

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[159] Section 67(2) of NEMBA.
[160] Section 70(1) of NEMBA. A list has been published in draft form in General Notice 350 of 2009 in Government Gazette 32090 dated 3 April 2009.
[161] Degrees of Control:
1a – Invasive species requiring compulsory control
1b – Invasive species controlled as part of an invasive species control programme
2 – Invasive species regulated by area
3 – Invasive species regulated by activity.
[162] Section 69 of NEMBA.
[163] Section 73 of NEMBA.
[164] Section 78 of NEMBA. GMOs are dealt with in greater detail under the Genetically Modified Organisms Act 15 of 1997.

One of the main objectives of the CBD is to regulate the bioprospecting of genetic material obtained from indigenous biological resources and to ensure that bioprospecting is carried out in a fair and equitable manner. This objective is also contained in NEMBA.[165] Bioprospecting is also regulated using the permitting approach and the Act provides that it is prohibited for any person to engage in the commercialisation phases of prospecting involving any indigenous biological resources or export from South Africa any indigenous biological resources for bioprospecting or research without obtaining a permit to do so.[166] Furthermore, a permit is only to be granted if the issuing authorities are satisfied that the person providing the access to the resources or knowledge consents to doing so and that the interests of all the stakeholders are protected.[167] The Minister of Environmental Affairs and Tourism has promulgated Regulations on Bio-prospecting, Access and Benefit Sharing[168] to facilitate the permit system for bioprospecting and exporting indigenous biological resources.

3.2.2 National Environmental Management Act

The National Environmental Management Act 107 of 1998 was borne out of the White Paper on Environmental Policy.[169] In terms of biodiversity and according to the Preamble, NEMA aims to '...promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development....' That being said, the main purpose of the Act is to give effect to the section 24 environmental right contained in the Bill of Rights and, furthermore, according to the Long Title

> To provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental

[165] Chapter 6 of NEMBA.
[166] Section 81 of NEMBA.
[167] Section 82 of NEMBA.
[168] Government Notice R.138 in *Government Gazette* 30739 dated 8 February 2008.
[169] Government Notice R.749 in *Government Gazette* 18894 dated 15 May 1998.

functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith.

NEMA is the framework environmental legislation in South Africa and 'aims to define overarching and generic principles in terms of which sectoral-specific legislation is embedded, as well as to enhance co-operative environmental governance amongst fragmented line ministeries'.[170] Other sectoral or specific environmental management Acts (SEMAs) dealing with biodiversity conservation and protection that fall under the umbrella of NEMA are NEMBA and NEMPAA which deal with biodiversity matters and the establishment of protected areas, respectively.

As the framework environmental law, NEMA consists of generic characteristics which include the provision of a flexible legal framework which is achieved through the establishment of broadly defined environmental principles. The pursuit of sustainability is considered to be a fundamental requirement in NEMA and this can be achieved through equal justice being given to the three spheres of sustainability: ecological, economic and social.[171] Section 2 of NEMA gives effect to these sustainability principles and in particular mentions that 'development must be socially, environmentally and economically sustainable'[172] and 'that the disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot altogether be avoided, are minimised and remedied'.[173]

A welcomed inclusion in the Act is provision made for the establishment of co-operative governance contained in Chapter 3. The mechanisms and structures that are catered for in this chapter are to assist in the co-ordination and

[170] Nel. K. & du Plessis. W. 'An Evaluation of NEMA based on a Generic Framework for Environmental Framework Legislation' (2001) *SAJELP* Vol 8 No 1 page 1.
[171] Nel & du Plessis, op cit page 6.
[172] Section 2(3) of NEMA.
[173] Section 2(4)(a)(i) of NEMA.

harmonisation of policies, plans, programs and projects between and across the spheres of government. These mechanisms take the form of Environmental Implementation Plans (EIPs) and Environmental Management Plans (EMPs) and they must be aligned with NEMA principles. All EIPs and EMPs that have been compiled under each National Department are to be updated every 4 years.[174]

NEMA utilises the provisions contained in Chapter 5 to give effect to the second part of the environmental right contained in the Bill of Rights[175] and to address the issue of integrated environmental management (IEM). IEM is a procedure that ensures that with regard to certain activities, the full extent of consequences to the environment are realised before an activity or development can take place.[176] Thus, an assessment of the environmental costs is essential in the planning phase and an environmental authorisation (EA) is required from the relevant authorities before the commencement of activities can take place. Section 24 of the Act deals explicitly with EAs and provides that '(t)he Minister, or an MEC with the concurrence of the Minister, may identify – (a) activities which may not commence without environmental authorisation from the competent authority....'[177] In terms of section 24(5), the Minister of Water and Environmental

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[174] Sections 11(1) and (2) of NEMA respectively.

[175] Section 24(b) of NEMA .

[176] Section 23(2) of NEMA states that the general objective of IEM is to –

(a) promote the integration of the principles of environmental management set out in section 2 into the making of all decisions which may have a significant effect on the environment;

(b) identify, predict and evaluate the actual and potential impact on the environment, socio-economic conditions and cultural heritage, the risks and consequences and alternatives and options for mitigation of activities, with a view to minimising negative impacts, maximising benefits, and promoting compliance with the principles of environmental management set out in section 2;

(c) ensure that the effects of activities on the environment receive adequate consideration before actions are taken in connection with them;

(d) ensure adequate and appropriate opportunity for public participation in decisions that may affect the environment;

(e) ensure the consideration of environmental attributes in management and decisionmaking which may have a significant effect on the environment; and

(f) identify and employ the modes of environmental management best suited to ensuring that a particular activity is pursued in accordance with the principles of environmental management set out in section 2.

[177] Section 24(2)(a) of NEMA.

Affairs has promulgated Environmental Impact Assessment Regulations, 2010.[178] These Regulations are the third generation of Environmental Impact Assessment Regulations for South Africa and result from a range of consultation processes with interested and affected parties. The Regulations cover the issues of Environmental Impact Assessment that deal with competent authorities;[179] an application for an EA;[180] amendments or suspensions of EAs;[181] exemptions from requiring EAs;[182] and Appeals[183], amongst others.

Section 24F of NEMA also prohibits the commencement of a listed activity or an activity specified in terms of section 24(2)(a) or (b) unless an EA has been granted from the competent authority concerned. The Minister of Water and Environmental Affairs has published three lists identifying listed activities that require either a basic EIA in terms of Regulations 21 - 25 or a full EIA subject to scoping and environmental impact reporting in terms of Regulations 26 – 35, prior to the commencement of the activities.[184] The third list that has been promulgated identifies those activities that require EAs prior to commencement of the activities and where the activities are undertaken in specified identified geographical areas only e.g. a protected area, biosphere reserve or a World Heritage Site.[185] All three lists also identify the competent authorities responsible for granting EAs depending on the type of activity that is to take place. In addition to the listing of activities, the Environmental Management Framework Regulations, 2010, have also been promulgated and allow for the initiation of the compilation of information and maps specifying the attributes of the environment in particular geographical areas and for such information to inform environmental management. [186] The purpose of environmental management frameworks is to

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[178] Government Notice R.543 in *Government Gazette* 33306 dated 18 June 2010.
[179] Chapter 2 of the EIA Regulations, 2010.
[180] Chapter 3 of the EIA Regulations, 2010.
[181] Chapter 4 of the EIA Regulations, 2010.
[182] Chapter 5 of the EIA Regulations, 2010, and in terms of section 24(M) of NEMA.
[183] Chapter 7 of the EIA Regulations, 2010.
[184] Government Notices R.544 and R.545 in *Government Gazette* 33306 dated 18 June 2010.
[185] Government Notice R.546 in *Government Gazette* 33306 dated 18 June 2010.
[186] Government Notice R.547 in Government Gazette 33306 dated 18 June 2010.

promote sustainability, secure environmental protection and to promote cooperative environmental governance.[187]

Part 2 of Chapter 7, deals with the application and enforcement of NEMA and SEMAs and in particular provides for the designation of Environmental Management Inspectors (EMIs).[188] The function of an EMI is to 'monitor and enforce compliance with a law for which he or she has been designated in terms of that section'.[189] Hence, EMIs are tasked with monitoring compliance with NEMA and those SEMAs that they have been mandated to enforce and are empowered to take appropriate action should a breach in compliance with these laws be established. The establishment of EMIs is a relatively recent development and the benefits thereof are already being realized. However, that being said, huge challenges remain in the enforcement of NEMA and SEMAs. One relevant and obvious example is that of the considerable increase in rhino poaching that has taken place in the past year or two. It is simply not enough to have the statutory instruments in place without adequate enforcement to back it up. The responsibilities of EMIs must be clearly defined so that they are able to carry out their duties as efficiently and effectively as possible. Paterson et al concur and provide that 'it is essential that their powers and functions are strategically co-ordinated and aligned so as to minimize duplication, confusion and undesirable resultant governance inefficiencies.'[190]

3.2.3 National Environmental Management: Protected Areas Act

According to Glazewski, South Africa's new dispensation inherited a well developed system of protected areas that were established during the apartheid era and before.[191] Reasons forwarded for this sophisticated and organised system of protected areas is due to the colonial protectionist approach to

[187] Regulation 2(3) of the Environmental Management Framework Regulations, 2010.
[188] Sections 31B, 31BA and 31C of NEMA.
[189] Section 31G(1)(a) of NEMA.
[190] Paterson et al (2009), op cit page 371.
[191] Glazewski, op cit page 327.

conservation in Africa at that time, which was to exclude rural people from protected areas thus ensuring a greater protection of wild animals and their habitats.[192]

Traditional area-based conservation such as the development of protected areas is considered as a primary strategy for the protection and conservation of biodiversity in South Africa and is currently formally managed by NEMPAA. Currently 5.4% of South Africa's land surface is formally protected but the aim is to increase this to 8% of the land surface and 20% of the marine areas in the near future.[193] The Act provides that the State is the trustee of the protected areas in the Republic[194] and that it must be interpreted and applied in conjunction with the national environmental management principles contained in NEMA[195] and NEMBA.[196]

The establishment of the National Environmental Management: Protected Areas Act was in response to South Africa's obligation set out in Article 8(a) of the CBD which states

> Each Contracting Party shall, as far as possible and as appropriate:
>
> (a) Establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity;

Accordingly, the Act identifies the following five categories of protected areas:

(a) special nature reserves, national parks, nature reserves (including wilderness areas) and protected environments;
(b) world heritage sites declared in terms of the World Heritage Convention Act, 49 of 1999;
(c) marine protected areas;

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[192] Glazewski, op cit page 326.
[193] Strydom & King, op cit page 115 and Glazewski, op cit page 327.
[194] Section 3(1) of NEMPAA.
[195] Section (5)(1)(a) of NEMPAA.
[196] Section 6 of NEMPAA.

(d) specially protected forest areas, forest nature reserves and forest wilderness areas declared in terms of the National Forests Act, 84 of 1998: and

(e) mountain catchment areas declared in terms of the Mountain Catchment Areas Act, 63 of 1970.[197]

Chapter 3 of the Act provides the purpose for declaring areas as protected areas,[198] as well as defines the different criteria that must be met for the identification of the different types of protected areas. The Act also provides for the withdrawal of a declaration or exclusion of part of a protected area. The applicable section contained in the Act depends on the type of protected area whose declaration is being withdrawn.

The Act also makes provision for protected environments which may be issued in order

(a) to regulate the area as a buffer zone for the protection of a special nature reserve, national park, world heritage site or nature reserve;

(b) to enable owners of land to take collective action to conserve biodiversity on their land and to seek legal recognition therefor;

(c) to protect the area if the area is sensitive to development due to its-

(i) biological diversity;

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[197] Section 9 of NEMPAA.

[198] Section 17 of NEMPAA: The purposes of the declaration of areas as protected areas are-

(a) to protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas;

(b) to preserve the ecological integrity of those areas;

(c) to conserve biodiversity in those areas;

(d) to protect areas representative of all ecosystems, habitats and species naturally occurring in South Africa;

(e) to protect South Africa's threatened or rare species;

(f) to protect an area which is vulnerable or ecologically sensitive;

(g) to assist in ensuring the sustained supply of environmental goods and services;

(h) to provide for the sustainable use of natural and biological resources;

(i) to create or augment destinations for nature-based tourism;

(j) to manage the interrelationship between natural environmental biodiversity, human settlement and economic development;

(k) generally, to contribute to human, social, cultural, spiritual and economic development; or

(l) to rehabilitate and restore degraded ecosystems and promote the recovery of endangered and vulnerable species.

(ii) natural characteristics;

(iii) scientific, cultural, historical, archaeological or geological value;

(iv) scenic and landscape value; or

(v) provision of environmental goods and services;

(d) to protect a specific ecosystem outside of a special nature reserve, national park, world heritage site or nature reserve;

(e) to ensure that the use of natural resources in the area is sustainable; or

(f) to control change in land use in the area if the area is earmarked for declaration as, or inclusion in, a national park or nature reserve.[199]

The management of protected areas is dealt with in Chapter 4 of the Act and only applies to protected areas identified as a special nature reserve, national park, nature reserve or protected environment.[200] The relevant management authorities are identified in terms of the Act and their main function is centered on the development of a management plan[201] whose purpose is 'to ensure the protection, conservation and management of the protected area concerned in a manner which is consistent with the objectives of this Act and for the purpose it was declared'.[202] Subsections 41(2) and (3) provide what the management plan must and may contain, respectively.

The Act also restricts a number of activities in protected areas. These include a restricting access;[203] restricting the use of aircraft;[204] restricting prospecting and mining activities;[205] commercial and community activities;[206] and restricting development activities.[207] The Regulations[208] published in terms of the Act that deal with the proper administration of special nature reserves, national parks and

[199] Section 28(2) of NEMPAA.
[200] Section 37 of NEMPAA.
[201] Sections 38 and 39 of NEMPAA, respectively.
[202] Section 41(1) of NEMPAA.
[203] Sections 45 and 46 of NEMPAA.
[204] Section 47 of NEMPAA.
[205] Section 48 of NEMPAA.
[206] Section 50 of NEMPAA.
[207] Section 51 of NEMPAA.
[208] Regulations for the Proper Administration of Special Nature Reserves, National Parks and World Heritage Sites contained in Government Notice R.1061, published in *Government Gazette* 28181 dated 28 October 2005.

world heritage sites also prohibit certain activities from taking place within protected areas. The Regulations prohibit any person from undertaking, supporting or participating in any restricted activity within a special nature reserve, national park or world heritage site without prior written authorisation from the management authority.[209] These restricted activities are in relation to a specimen of a protected species and a specimen of an alien species or listed invasive species[210] and are described in detail in the Regulations.

Chapter 5 of the Act is dedicated to South African National Parks and deals with the continued existence and functions of South African National Parks, amongst other matters.

3.2.4 Environment Conservation Act

Although, the ECA has in the greater part been repealed by NEMA, the sections that remain are of particular significance to the 'effective protection and controlled utilization of the environment'.[211] The sections of the Act that remain are those that deal with definitions;[212] the control of activities that may have a detrimental effect on the environment;[213] the promulgation of Regulations;[214] offences, penalties and forfeiture;[215] and general provisions.[216]

Part V, arguably the most important aspect of the Act,[217] deals with the control of activities which may have a substantial detrimental effect on the environment whether in general or in respect of certain areas.[218] The Minister is empowered

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[209] Regulation 45(1) of NEMPAA.
[210] Regulations 45(2)(a) and (b) of NEMPAA, respectively.
[211] Long Title of ECA.
[212] Section 1 of ECA.
[213] Part V of ECA.
[214] Part VI of ECA.
[215] Part VII of ECA.
[216] Part VIII of ECA.
[217] Glazewski, op cit page 159.
[218] Section 21(1) of ECA.

to identify those activities[219] and prohibit any person from undertaking an identified activity without having obtained written authorisation from the relevant authority.[220] Furthermore, a competent authority may declare an area as a limited development area whereby no person may develop or conduct a specific activity within a limited development area unless prior authorisation from the competent authority has been granted.[221]

Section 26 is a powerful section as it empowers the Minister or competent authority to make regulations dealing with environmental impact reports associated with identified or prohibited activities. The Environmental Impact Assessment Regulations[222] are published in terms of NEMA and set out the procedure to be followed by developers who require authorisation for their activities. In 1992 an important amendment was made to the Act which allowed for the exemption of persons, local authorities and government institutions from the application of any provision of any regulation, notice of direction promulgated or issued in terms of the Act.[223] According to Glazewski, this section has been used in the granting of exemptions pertaining to the carrying out of environmental authorisations.[224]

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[219] Section 21(2) of ECA: Identified activities fall into the following categories:
- (a) Land use and transformation;
- (b) water use and disposal;
- (c) resource removal, including natural living resources;
- (d) resource renewal;
- (e) agricultural processes;
- (f) industrial processes;
- (g) transportation;
- (h) energy generation and distribution;
- (i) waste and sewage disposal;
- (j) chemical treatment;
- (k) recreation.

[220] Section 22 of ECA.
[221] Section 23 of ECA.
[222] Environmental Impact Assessment Regulations, 2010, contained in Government Notice R.543 published in *Government Gazette* 33306 dated 18 June 2010.
[223] Section 28A of ECA.
[224] Glazewski, op cit page 159.

Another important section is that of section 31A which allows the Minister, competent authority, local authority or government institution to take certain steps where the environment has been damaged, endangered or detrimentally affected. This means that the Minister, competent authority, local authority or government institution may in writing direct a person to cease an activity or take certain steps in the event that the environment is being seriously damaged, endangered or detrimentally affected.[225] Moreover, a person may be directed to perform an activity such as rehabilitating any damage and if he or she fails to carry out the direction then whoever ordered the direction is permitted to perform the activity or function and recover the costs from the person concerned.

Section 31A is similar to that of section 28 contained in NEMA but contains advantages. The provision contained in the ECA can be exercised more widely as section 28 is confined to the Director-General or the provincial head of department. In terms of section 31A of the ECA, any relevant person down to a compliance officer is empowered to issue a section 31A directive. Furthermore, failure to comply with a section 31A directive is an offence and upon conviction carries a fine or imprisonment or both a fine and imprisonment.[226]

[225] Section 31A(1) of ECA.
[226] Kidd, op cit page 138.

Chapter 4: The Listing of Threatened Species Approach

South Africa's biodiversity is constantly under threat due to many natural and human-induced activities. Consequently, a suite of legal tools have been established in order to curtail and reduce the amount of biodiversity loss that is currently taking place outside of protected areas. These include, but are not limited to: Biodiversity Management Plans; Environmental Impact Assessments (EIAs); Bioregional Plans; and the establishment of protected areas.

This chapter focuses on another equally important instrument used in biodiversity conservation: the listing of threatened species approach. This conservation approach is designed to improve biodiversity conservation by using empirical data on individual species to assess species' global status and risk. The chapter is an assessment of this approach starting from the conception of the IUCN Red List of Threatened Species leading up to how these lists are currently being used as a legal instrument to protect and conserve South Africa's biodiversity.

4.1 IUCN Red List of Threatened Species

4.1.1 Introduction

In the 1960s, it became apparent amongst scientists and nature conservationists that the threat status of global species was increasing at an alarming scale and extinction rates had to be addressed with a view to reducing them. Sir Peter Scott, a founding member of the World Wide Fund for Nature and of several wetlands bird sanctuaries in Britain,[227] realized that Threatened Species Lists (TSLs) could be used as a conservation tool to detail the global conservation status of species thereby assisting in the fight against species extinction. In 1966 he compiled the first two volumes of Red Data Books on mammals and birds which subsequently led to the development of the IUCN Red List of Threatened

[227] http://en.wikipedia.org/wiki/Peter_Scott_(conservationists) accessed 13 September 2011.

Species.[228] The development of the IUCN Red List was not aimed at offering legally enforceable protection to threatened species (unless a country develops its own national list or has legislation in place that is legally binding), but rather to highlight the risk of global extinction of threatened species and for establishing conservation priorities.

Historically, the IUCN Species Survival Commission[229] had adopted qualitative IUCN criteria to classify threatened species. However, in 1994, the IUCN criteria was modified and adapted to be used as a more scientifically-based quantitative assessment tool and hence more objective in nature. The IUCN Red List was designed to classify threatened species on a global level but guidelines on how to apply the IUCN criteria on a regional and national level have since been published.[230] The guidelines were developed as a result of an increased interest by national and regional authorities to develop and compile their own national and regional TSLs. The valuable information contained in the national TSLs is then incorporated into the IUCN Global Red Data List which is then accessible by anyone anywhere in the world. The bidirectional flow of information between national and global Red Lists assessments is a crucial characteristic of TSLs.

The IUCN Red List has two main goals: the first, a traditional goal, to identify and document species that require conservation as they are threatened with extinction, and the second goal, which is more complex, is to identify and monitor trends in species status. The IUCN Red List hopes to achieve its goals by establishing a baseline to monitor changes in species status; providing a global

[228] Vié J.-C, Hilton-Taylor C, Pollock C, Ragle J, Smart J, Stuart, S N and Tong R The IUCN Red List: a key conservation tool (2008) in J-C Vié, C Hilton-Taylor and S N Stuart (eds.). The 2008 Review of the IUCN Red List of Threatened Species. IUCN Gland, Switzerland page 3 accessed 23 May 2011http://cmsdata.iucn.org/downloads/the_iucn_red_list_a_key_conservation_tool.pdf
[229] This is one of six commissions within the IUCN. It is the body responsible for the IUCN Red Lists and has almost 7000 members, each belonging to one or more of the 115 Specialist Groups, most of which are involved in assessing the extinction risks of taxa.
[230] IUCN Standards and Petitions Subcommittee. 2010. Guidelines for Using the IUCN Red List Categories and Criteria. Version 8.1. Prepared by the Standards and Petitions Subcommittee in March 2010. Downloadable from http://www.iucnredlist.org/documents/RedListGuidelines.pdf accessed 23 May 2011.

context for establishing conservation priorities at a local level;[231] and monitoring continuously the status of species used as biodiversity indicators that cover all the major ecosystems of the world. The IUCN Red List is credited with being extremely scientific and of the highest standard and integrity as its assessment process is transparent, independent and objective. The IUCN Red List also assists in informing and influencing national and international policy and provides information to international conventions such as the Convention on Biological Diversity (CBD) and the Convention on International Trade in Endangered Species of Fauna and Flora (CITES). The categories and criteria that are used are based on consistent use and open to criticism. The data is regularly updated and freely available to the public. Moreover, findings are often published. [232]

Empirical data regarding biological factors is used in the IUCN Red List assessments. This data is based on a species' population size; size of geographical distribution; rate of decline in population; population trends; degree of population and distribution fragmentation; and the number of mature individuals, amongst others. Mandatory information on each species is required in order to meet the minimum documentation requirements. In addition to the taxon's name, status, criteria and distribution, as a minimum the following information is also required: justification to support the listing; a map of the extent of occurrence; a list of the major habitats the species is found in; what the major threats are; an indication as to whether the species' population trend is increasing, decreasing, stable or unknown; what conservation actions are in place or are needed; and information on the utilization of the species.[233]

It is vitally important that TSLs remain objective and that they do not include subjective or ambiguous elements as this can lead to different interpretations and

[231] http://www.iucn.org/about/work/programmes/species/red_list/about_the_red_list/ accessed 23 May 2011.
[232] Vié, J.-C et al, op cit pages 3-4.
[233] http://www.iucnredlist.org/about accessed 23 May 2011.

erroneous results. Two assessors who evaluate the same species using the same data should arrive at the same threatened species category.[234]

Today, the IUCN Red List is the most comprehensive inventory of plant and animal species detailing their global conservation status and is recognized as the most authoritative guide to the status of biological diversity in the world.[235] Since then the IUCN Red List of Threatened Species has evolved considerably over the past five decades. The IUCN Red List of Threatened Species is also known as the IUCN Red List or the Red Data List.

4.1.2 Current Criteria and Categories of the IUCN Red List of Threatened Species

The criteria used by assessors to determine the threat status of species have undergone an extensive review in recent years in order to improve the objectivity, repeatability, utility and reputation of the IUCN Red List.[236] In 2001, *Guidelines for Using the IUCN Red List Categories and Criteria*, a list of nine categories and five quantitative criteria, were published as a guideline to assist assessors in the appropriate categorization of species.

The nine categories that are used to assess species and subspecies depending on their conservation status are the following: Those species that are at the highest risk of extinction and where the situation needs to be highlighted are categorized as critically endangered (CR), endangered (EN), or vulnerable (VU). Species that are known or presumed to be extinct are categorized as extinct (EX) or extinct in the wild (EW), respectively. The last group where sufficient

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[234] De Grammont, P C and Cuarón A D 'An Evaluation of Threatened Species Categorisation Systems used on the American Continent' (2006) *Conservation Biology* Vol.20 No.1 page 15.
[235] http://www.iucn.org/about/work/programmes/species/red_list/about_the_red_list/ accessed 23 May 2011.
[236] Miller R M, Rodriguez J P, Aniskowicz-Fowler T, Bambaradeniya C, Boles R, Eaton M A, Gärdenfors U, Keller V, Molur S, Walker S and Pollock C 'National Threatened Species Listing Based on IUCN Criteria and Regional Guidelines: Current Status and Future Perspectives' (2007) *Conservation Biology* Vol. 21 No. 3 page 688.

information is available to make an assessment of the conservation status of a species is that of the near threatened (NT) or least concerned (LC) categories. The former category refers to species that are close to meeting the threatened thresholds or would be threatened if there were not a conservation program in place for these species. The latter category deals with those species that have been evaluated and have a low risk of extinction. This group has only recently been added as a category in order to maintain transparency and to place threatened species in context. The final two categories are those where there is not enough data available and therefore that species can not be evaluated. This is known as the data deficient (DD) category. The not evaluated category (NE) refers to those taxa that have not been evaluated against the criteria.[237]

According to the IUCN (2001:4), the IUCN Red List criteria should only be applied to wild species populations that live inside their natural habitat range and that have resulted from benign introductions.[238] Furthermore, visiting taxa[239] may also be included in the categorization process, however, vagrant taxa[240] should not be assessed.

The IUCN Red List criteria (2001) that are used are based on biological indicators of populations threatened with extinction such as rapid population decline or very small population size. It is this criteria against which species are assessed and categorised as Critically Endangered (CR), Endangered (EN) or Vulnerable (VU) are:

A. Declining population (past, present and/or projected)

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[237] http://www.iucnredlist.org/about accessed 23 May 2011.
[238] Benign introductions are defined by IUCN (1998) as 'an attempt to establish a taxon, for the purpose of conservation, outside its recorded distribution but within an appropriate habitat and ecogeographical area'.
[239] Joshua Ginsberg 'The Application of IUCN Red List Criteria at Regional Levels (2001) *Conservation Biology* Vol 15 No 5 page 1207 defines visiting taxa as 'a taxon that does not reproduce within a region but regularly occurs within its boundaries either now or during some period in the last century.'
[240] Ginsberg, op cit defines vagrant taxa as 'a taxon that is currently found only very occasionally within the boundaries of a region.'

B. Geographic range size, and fragmentation, decline or fluctuations
C. Small population size and fragmentation, decline or fluctuations
D. Very small population or very restricted distribution
E. Quantitative analysis of extinction risk.[241]

The following Table shows the quantitative thresholds within each criterion which determines which category of threat a species is placed.

Table 2: The biological indicators of extinction risk as contained in each of the five IUCN criteria

Criterion	Biological Indicator	Risk Factor	Quantitative thresholds		
			CR	EN	VU
A	Large and rapid reduction in population size relative to the life history of the species	Proportion by which population is reduced	>80%	>50%	>30%
B	Small geographic range and decline, population fluctuation or fragmentation	Extent of occurrence (EOO) Area of occupancy (AOO)	<100km^2 <10km^2	<5000km^2 <500km^2	<20000km^2 <2000km^2
C	Small population size and decline	Population size Number of mature individuals in largest subpopulation Proportion of population in largest subpopulation	<250 <50 >90%	<2500 <250 >95%	<10000 <1000 >100%
D	Critically small population size or very restricted distribution	Population size Area of occupancy (AOO) Number of locations	<50	<250	<1000 <20km^2 5 or fewer
E	Quantitative analysis of extinction risk	Probability of extinction over a specified time period	50%	20%	10%

Source: Threatened Species Programme, SANBI (2010)[242]

[241] IUCN (2010), op cit.
[242] SANBI (2010) *Threatened Species: A guide to Red Lists and their use in conservation* Threatened Species Programme, Pretoria, South Africa page 14.

It is important to note that although all IUCN Red List criteria (2001) have quantitative thresholds, no criterion overrules any other, and subcriteria are also referred to. Although, at least one of the criteria must be met in order for a species to be assigned a threat category, a taxon must be assessed against as many of the criteria as possible in order to attain a true reflection of its conservation status.

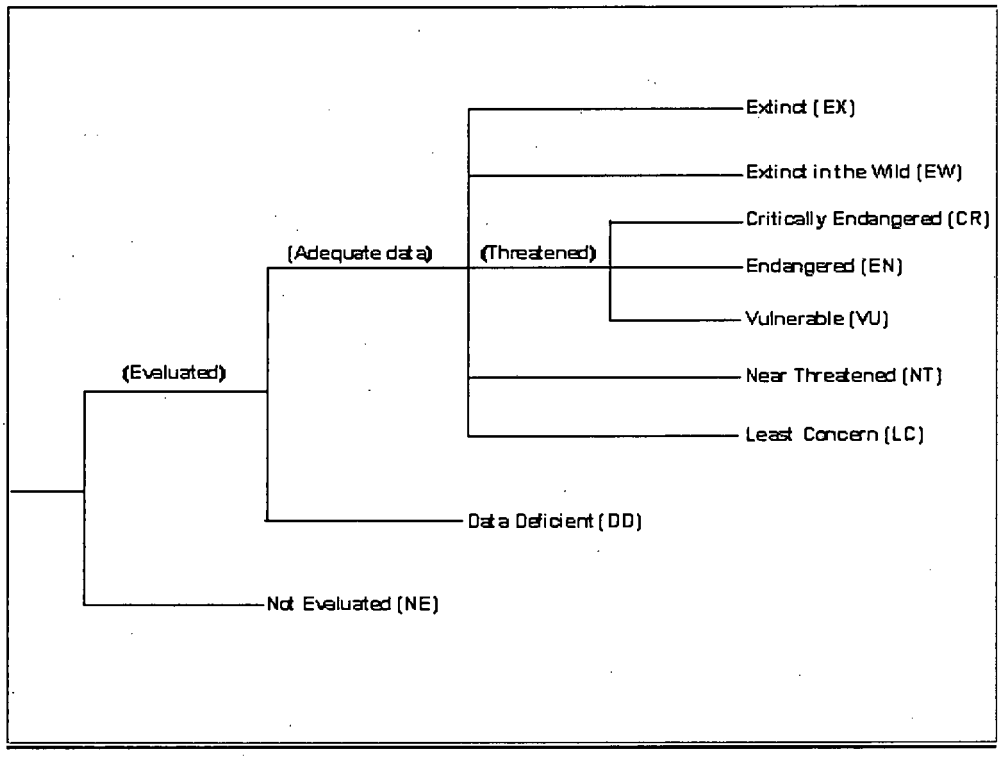

Figure 1: IUCN Red Data List Categories
Source: Gärdenfors (2001)[243]

The following is an explanation of the nine categories identified in Figure 1:

- **Extinct (EX):** A taxon is extinct when there is no reasonable doubt that the last individual has died. Furthermore, a taxon is presumed extinct when exhaustive

[243] Gärdenfors U 'Classifying the Threatened Species at National versus Global Levels' (2001) *Trends in Ecology & Evolution* Vol 16 No 9 page 512.

surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and 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;

- **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 naturalized population (or populations) well outside the past range. Furthermore, a taxon is presumed extinct in the wild when exhaustive surveys in known and/or expected habitat, at appropriate times (diurnal, seasonal, annual), and 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 the best available evidence indicates that it meets any of the criteria for critically endangered species, and it is therefore considered to be facing an extremely high risk of extinction in the wild;
- **Endangered (EN):** A taxon is endangered when the best available evidence indicates that it meets any of the criteria for endangered species, and it is therefore considered to be facing a very high risk of extinction in the wild;
- **Vulnerable (VU):** A taxon is vulnerable when the best available evidence indicates that it meets any of the criteria for vulnerable species, and it is therefore considered to be facing a high risk of extinction in the wild;
- **Near Threatened NT):** A taxon is near threatened when it has been evaluated against the criteria but does not currently qualify for critically endangered, endangered or vulnerable species, 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 and does not qualify for critically endangered, endangered, vulnerable or near threatened. Widespread and abundant taxa are included in this category;
- **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 are lacking. Data deficient is therefore not a category of threat.

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 a threatened status. If the range of a taxon is suspected to be relatively circumscribed, and 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 considered to be not evaluated when it is has not yet been evaluated against the criteria.[244]

The collection of data is carried out by thousands of scientific experts and other species assessors in partnership with IUCN Species Programme. These partners include BirdLife International, the Institute of Zoology (the research division of the Zoological Society of London, Conservation International, NatureServe, the World Conservation Monitoring Centre, and many Specialist Groups within the IUCN Species Survival Commission (SSC). Experts from universities, museums, research institutions and non-governmental organizations also contribute. Once the data has been collected, it is subjected to a peer review process where it is considered for inclusion in the IUCN Red List.[245]

Up until 2000, the list had been available in book format, however, a decision to merge plants and animals into a single list resulted in species coverage increasing to a point where it was no longer viable to produce assessment results in hard copy. Hence, today the IUCN Red List is only available in electronic format. The use of the electronic medium has meant that all species listed are now documented and a wider audience is now able to access the information. In 2008, over 44 000 species had been assessed and of these, 38% were classified as threatened and 804 as extinct. 5 570 species were classified as data deficient which means that many of these could possibly also be threatened.[246]

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[244] http://www.iucnredlist.org/apps/redlist/static/categories_criteria_3_1#categories accessed 01 August 2011.
[245] http://www.iucnredlist.org/about/red-list-overview#redlist_authorities accessed 23 May 2011.
[246] Vié, J.-C et al, op cit page 6.

Unfortunately, as only a small portion of the world's species have been assessed, it is not possible to know the true global status of biodiversity.

4.1.3 The Value of the IUCN Red List of Threatened Species

The IUCN Red List and other TSLs are used to inform national authorities, non-governmental organizations, academic institutions and the public on matters relating to the conservation and protection of species. TSLs are valuable tools that are used to estimate species risk extinction in finite time and in many countries, particularly developing countries, resources available for conservation efforts are limited and TSLs assist in setting priorities for the allocation of these limited resources. TSLs inform and influence conservation policies and national and international legislation as most countries undertake some form of national species assessment and TSL development. TSLs also encourage research and monitoring programs for species and/or habitats; monitor and report on the status of biodiversity; regulate development and control exploitation; target geographical areas for conservation planning; and increase public awareness of the impact that humans have on biodiversity.[247]

Possingham et al identify four common uses of TSLs: determining priorities for resource allocation for species conservation; to inform the design of reserves or protected areas; to impede development and resource exploitation; and to report on the state of the environment.[248] In many cases, the information derived from the compilation of TSLs is used for more than one purpose. De Grammont & Cuarón evaluated 25 categorisation systems from 20 countries and concluded that the current IUCN Red List was the most suitable for assessing species extinction risk.[249] Moreover, they recommended that governments compile three types of lists: threatened species lists; lists of species of conservation priority;

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[247] Miller.R.M et al, op cit page 685.
[248] Possingham H P, Andelman S J, Burgman M A, Medillin R A, Master L L, Keith DA 'Limits to the use of Threatened Species Lists' (2002) *Trends in Ecology & Evolution* Vol17 No11 page 503.
[249] De Grammont & Cuarón, op cit page 14.

and lists that serve as normative tools to assist them in decision making. The first list would assess the extinction risk of species using objectively obtained information such as species abundance and geographic distribution. The second list would determine which species is a conservation priority and requires protection. Subjective information pertaining to economic, political and social factors may be considered in order to allocate resources for conservation. The final list would not be a TSL but rather a normative tool to assist in the protection and conservation of species. This could be in the form of a list compiled in terms of CITES to regulate international trade in a country's endangered fauna and floral species.

It can be concluded that TSLs and in particular the IUCN Red List assist different user groups to determine which species are a conservation risk and which species are a conservation priority, and how scarce resources should be allocated to accommodate each grouping. The former is a more objective assessment of extinction risk and the latter a subjective guide using socio-economic indicators to steer planning processes for protected area expansion and conservation planning. They are also used to regulate the conservation of listed species through the development of enforceable legislation. These lists also guide scientific research as those species that are classified as Data Deficient encourage and motivate scientists to conduct field surveys, taxonomic and ecological studies in order to reduce the gap on knowledge and to correctly classify species.[250]

South Africa makes use of two TSLs: Red Data Book for the Mammals of South Africa and the legally enforceable Threatened or Protected Species List, 2007. These two important TSLs are discussed in the next two sections.

[250] SANBI (2010), op cit page 20.

4.2 South African Red Data Lists

4.2.1 History of Red Data Lists in South Africa

Following the IUCN's publication of the first Red Data Books in the 1960's, the South African National Programme for Ecosystem Research (NPER) of the Council for Scientific and Industrial Research (CSIR) published the *South African Red Data Book: Small Mammals*[251] in 1976 and a similar book on *Large Mammals*[252] in 1977. The reason for publishing the books was to assist relevant authorities in conserving and managing ecosystems effectively as at that point it had become apparent that some species were under threat from extinction. The categories that species were placed in regarding both books were: Endangered; Vulnerable; Rare; Out of Danger; Indeterminate; Special Case; Not Designated; and Not Included. Up until 1986, the NPER had produced eight reports in the National Scientific Programmes Report series that included information on small and large mammals, birds, fishes, reptiles, amphibians, and vascular plants.

In 1986, the *South African Red Data Book – Terrestrial Mammals* was published by Raey Smithers[253] which was a consolidation of the two previous publications on South African Red Data Books as well as the inclusion of additional information obtained from recent research that had taken place. The book covered all terrestrial mammals found within the Republic of South Africa including the Independent States but excluded the Prince Edward Islands, for practical reasons. It had been anticipated that a separate book dedicated to marine mammals would be published at a later stage. It was important to consider information contained in previous publications, particularly the conservation status of taxa as it appeared in the Red Data Books of 1976 and

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[251] Meester J *South African Red Data Book: Small Mammals* (1976) South African National Scientific Programmes Report No 11, Pretoria, Council for Scientific and Industrial Research.
[252] Skinner J D Fairall N and Bothma J du P *South African Red Data Book – Large Mammals* (1977) South African National Scientific Programme Report No 18, Pretoria: Council for Scientific and Industrial Research.
[253] Smithers, op cit page v.

1977, as in some cases the threat status of certain terrestrial mammals had improved and were consequently downgraded from when they were last assessed. This was the case with the cheetah and the Cape mountain zebra. However, species such as the riverine rabbit required an upgrade in threat category and was moved from being a rare species to now being an endangered species.

The IUCN had at that time identified six categories of conservation status that were incorporated into the new book. These were: Extinct; Endangered; Vulnerable; Rare; Out of Danger; and Indeterminate. According to the List of Categories of the IUCN, 1978, the definition given to these categories was as follows:

- **Extinct:** Taxa which are known to have become extinct since the arrival of the first settlers to the Cape in 1652 and for which, therefore, there is an historical record.
- **Endangered:** Taxa in danger of extinction and whose survival is unlikely if the causal factors continue operating. Included are taxa whose habitat has been so drastically diminished in size and/or degraded that they are deemed to be in danger of extinction.
- **Vulnerable:** Taxa which it is believed are likely to move into the endangered category if the causal factors continue operating. Included are taxa of which all or most populations are decreasing because of overexploitation; extensive destruction or degradation of their habitat or other environmental disturbances; taxa with populations which have been seriously depleted and whose ultimate security is not yet assured and taxa with populations which are still sizeable but which are under threat from serious adverse factors throughout their range.
- **Rare:** Taxa with small populations which are not at present endangered or vulnerable but which are at risk. These taxa are usually localised within restricted geographical areas or habitats or are thinly scattered over a somewhat more extensive range.
- **Out of Danger:** Taxa formerly included in one of the above categories in the *South African Red Data Books: Mammals* and which are now considered to be

relatively secure because effective conservation measures have been taken; previous threat to their survival has been removed or which for other reasons it is inappropriate to retain their names in any category in this revision.

- **Indeterminate:** Taxa which might be worthy of inclusion in any of the above categories but for which insufficient information is currently available on which to judge their status.[254]

One difference made to the IUCN categorisation system at that time was an addition of a seventh category. The category was that of Extinct in South Africa.

Apart from the mandatory information that was included such as the English colloquial name and conservation status for each species, additional information was also supplied under the following twelve headings:

- present distribution
- former distribution
- habitat; habits
- breeding in the wild
- breeding potential in captivity
- reasons for decline
- numbers in captivity
- protective measures in operation
- protected measures proposed
- current research
- remarks
- references.

It is important to note that the heading 'protected measures in operation' referred to the legal status given to particular species as reflected in the various species lists contained in the provincial ordinances that had been promulgated at that time.

[254] Smithers, op cit page 6.

Of the 243 mammals that were assessed, 92 species were included in the *South African Red Data Book – Terrestrial Mammals* published in 1986 and 42 species (those species identified as Endangered, Vulnerable and Rare) were considered to be under some threat of extinction.[255] The two Extinct species were the quagga and the Blue antelope; the Extinct in South Africa species was the Lichtenstein's hartebeest as it is found elsewhere in Southern Africa; three species were identified as endangered i.e. riverine rabbit, wild dog and the Roan antelope; 14 species were identified as vulnerable; 25 species were found to be rare; two species found to be Out of Danger were the cheetah and the African elephant; and it was revealed that not enough information was available for 45 species but that their inclusion in the Indeterminate category was necessary.[256]

A major weakness of this edition in the Red Data Book series of South Africa is that sufficient data on subspecies is lacking specifically regarding the range of distribution of subspecies. Furthermore, a large number of species (45 of the 92 species) are categorised as Indeterminate which means that insufficient information has been collected on these species and their conservation status may become upgraded to one of the threatened categories should their be sufficient data available. Moreover, major gaps in information are also found under the twelve mandatory headings of species included in the other categories.

However, both in theory and in practice, the benefit of Red Data Books can not be underestimated. Their use at that juncture in informing authorities in updating their provincial ordinances and subsequently providing current and relevant legal protection of listed species is of primary importance. Government Departments, provincial conservation agencies and environmental consultants also use Red Data Books to assist in decision making involving matters pertaining to developments and recommendations regarding agriculture, water affairs and nature conservation. They are also used in fundraising for research projects,

[255] Smithers, op cit page iv.
[256] Smithers, op cit pages 10-11.

guiding further taxonomic and ecological research for museums and organisations, and assist in educating the public on which particular species require protection from possible extinction.[257]

4.2.2 The Red Data Book for Mammals of South Africa: A Conservation Assessment

The *Red Data Book for Mammals of South Africa:A Conservation Assessment* [258] was produced in 2004 as a result of the need to review and update the previous *South African Red Data Book – Terrestrial Mammals* published in 1986. The major differences between the two publications were that the new version included assessments done to both marine and terrestrial mammals (including sub-species) and utilised the most recent version (version 3.1, 2001) of the IUCN's Red List Categories and Criteria at a regional level. The new version was compiled using assessments carried out by civil society in collaboration with the Endangered Wildlife Trust (EWT) over a two year period. Once the fieldwork had been completed, the IUCN Red List office in the United Kingdom along with other stakeholders conducted a rigorous peer review of the information that had been collected.

Each species was dealt with under 22 headings that included: habitat loss; threats; trade; population numbers; population trends; recent field studies; captive breeding/cultivation recommendations, amongst others.[259] Of the 295 South African mammal species and subspecies that were assessed, all were included in the publication as they had all been assigned categories. Species were categorised as follows:

- 10 (3%) Critically Endangered

[257] Smithers, op cit page 4.
[258] Friedmann & Daly, op cit.
[259] http://www.wildwatch.com/book_reviews/mammals-1/red-data-book-of-the-mammals-of-south-africa accessed 19 August 2011.

- 18 (6%) Endangered
- 29 (10%) Vulnerable
- 53 (18%) Data Deficient
- 38 (13%) Near Threatened
- 147 (50%) Least Concern.[260]

Alarmingly, 57 or 19% of the total terrestrial and marine species assessed were assigned threat categories (Critically Endangered, Endangered and Vulnerable). Furthermore, of the 10 Critically Endangered species, seven are endemic to South Africa and one-third of the species identified as Endangered are endemic to South Africa.[261]

The South African National Biodiversity Institute (SANBI) has also published the *Red List of South African Plants* (2009) which is a full assessment of all flora found in South Africa – 20 456 species. This immense project was funded by the Norwegian Ministry of Foreign Affairs' development branch Norad and the assessment uses the IUCN's Red List Categories and Criteria. The results of this publication have doubled the number of plants on the IUCN's Global Red List as South Africa is one of the world's most biologically diverse countries, particularly regarding floral species. The results of the assessment revealed that 2 577 wild plant species or 13% are threatened and in danger of extinction. A further 2 232 plant species are listed under categories of conservation concern (most of these plant species are found in the Western Cape Province) which means that one in four floral species are threatened in South Africa. Forty plant species are listed as Extinct and a further 76 are probably extinct (listed as Critically Endangered Possibly Extinct). Reasons forwarded for wild plant species increasingly becoming threatened is due to loss of natural habitat, habitat degradation and the encroachment of invasive alien plant species.[262]

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[260] http://www.enviropaedia.com/topic/default.php?topic_id=79 accessed 19 August 2001.
[261] Ibid.
[262] http://www.sanbi.org.za/index.php?option=com_content&view=article&id=951 accessed 19 August 2001.

The Red Data Books are of immense value when assessing the conservation status of species in South Africa. Unfortunately, however, they serve only as a guide and reference as they currently do not have any legal standing and do not offer legally enforceable protection to species that are listed. Species lists do however inform environmental legislation that can be used as a legal tool for conserving biodiversity, and this matter is dealt with in the next section.

4.3 South African Legal Context

4.3.1 List of Critically Endangered, Endangered, Vulnerable and Protected Species

The process of developing the Threatened or Protected Species list (ToPS) was carried out by the Department of Environmental Affairs and Tourism (DEAT). A consultative and public participation process was set up by DEAT where relevant stakeholders were invited to register in one of three categories: institutions, experts or interested individuals. Those stakeholders who registered were placed on a roster and were invited to take part in ad hoc expert group workshops that were held in Pretoria, Grahamstown and Cape Town during November 2004. Draft lists were drawn up at the workshops and were then circulated to all the experts on the roster as well as to the broader stakeholder group for input and finalisation.[263] The criteria that were used for the compilation of the ToPS list were determined by

(a) a legal obligation in accordance with CITES; or
(b) that the continued survival of the species is threatened; and
(c) the threat to continued survival of the species results from one or more of the restricted activities as defined by NEMBA.[264]

[263] Species Listing Vol 1 Issue I 5 November 2004 pages 1-2.
[264] Species Listing Vol 1 Issue II 26 November 2004 page 2.

The ToPS lists that were drawn up included the scientific and common name of mammals; birds; plants; reptiles and amphibians; fishes; and invertebrates,[265] and categorised species according to their threat status. It is important to note that the 'criteria and listing process applied to listing species in terms of the Act, is completely different to the assessment process followed in the Red Data Listings..., unless such a Red Data species is impacted on by a 'restricted activity', which excludes habitat destruction, it will receive no protection by listing it as either a threatened or protected species'.[266] Thus, the categorisation process of listed species was not originally based on the IUCN's categories and criteria, but rather according one criterion which is the nature of threats that species faced as a result of restricted activities. The Red Data listing process is, however, very valuable for the listing of threatened species in terms of NEMBA and assists in the compilation of the ToPS list.

The listing of species was not a reflection of threat status or conservation status but rather a legal process whereby protection is required to protection a species against threats from restricted activities. These restricted activities are defined in section 1(a) of NEMBA as

(a) in relation to a specimen of a listed threatened or protected species, means-
    (i) hunting, catching, capturing or killing any living specimen of a listed threatened or protected species by any means, method or device whatsoever, including searching, pursuing, driving, lying in wait, luring, alluring, discharging a missile or injuring with intent to hunt, catch, capture or kill any such specimen;
    (ii) gathering, collecting or plucking any specimen of a listed threatened or protected species;
    (iii) picking parts of, or cutting, chopping off, uprooting, damaging or destroying, any specimen of a listed threatened or protected species;

[265] http://www.speciesstatus.sanbi.org/threatened.aspx accessed 01 August 2011.
[266] Species Listing Newsletter Vol. I, Issue III. DEAT. 21 February 2005 page 3.

(iv) importing into the Republic, including introducing from the sea, any specimen of a listed threatened or protected species;

(v) exporting from the Republic, including re-exporting from the Republic, any specimen of a listed threatened or protected species;

(vi) having in possession or exercising physical control over any specimen of a listed threatened or protected species;

(vii) growing, breeding or in any other way propagating any specimen of a listed threatened or protected species, or causing it to multiply;

(viii) conveying, moving or otherwise translocating any specimen of a listed threatened or protected species;

(ix) selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of a listed threatened or protected species; or

(x) any other prescribed activity which involves a specimen of a listed threatened or protected species;

NEMBA also provides for the management of alien and invasive species in terms of the impact of alien species on indigenous biodiversity as well as controlling the introduction, spread, management and eradication of invasive species.[267]

The final national List of Critically Endangered, Endangered, Vulnerable and Protected Species for South Africa (see Annexure 1) was published in 2007 and uses the same terminology used by the IUCN Red List.[268] It contains species

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[267] Section 1(b) of NEMBA
(b) in relation to a specimen of an alien species or listed invasive species, means-
(i) importing into the Republic, including introducing from the sea, any specimen of an alien or listed invasive species;
(ii) having in possession or exercising physical control over any specimen of an alien or listed invasive species;
(iii) growing, breeding or in any other way propagating any specimen of an alien or listed invasive species, or causing it to multiply;
(iv) conveying, moving or otherwise translocating any specimen of an alien or listed invasive species;
(v) selling or otherwise trading in, buying, receiving, giving, donating or accepting as a gift, or in any way acquiring or disposing of any specimen of an alien or listed invasive species; or
(vi) any other prescribed activity which involves a specimen of an alien or listed invasive species.

[268] Contained in Government Notice R.151 published in *Government Gazette* 29657 dated 23 February 2007.

that are deemed threatened as a result of a restricted activity identified in terms of NEMBA and consequently are allocated one of the following threat categories:

(a) **critically endangered species**, being any indigenous species facing an extremely high risk of extinction in the wild in the immediate future;
(b) **endangered species**, being any indigenous species facing a high risk of extinction in the wild in the near future, although they are not a critically endangered species;
(c) **vulnerable species**, being any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future, although they are not a critically endangered species or an endangered species; and
(d) **protected species**, being any species which are of such high conservation value or national importance that they require national protection, although they are not listed in terms of paragraph (a), (b) or (c).

Species listed as protected species are also protected under international agreements that South Africa has ratified. These include CITES and the Convention on the Conservation of Migratory Species of Wild Animals.[269] CITES requires that species listed in the CITES appendices are provided with legal protection in domestic law regardless whether the listed species is indigenous or not. The compilation of the List is also in line with South Africa's obligations as a signatory to the Convention on Biological Diversity.[270]

In terms of South African law, the ToPS list is a legally binding instrument and prohibits any person from carrying out a restricted activity involving a specimen of a listed threatened or protected species without a permit that has been issued in terms of Chapter 7 of NEMBA. Moreover, the DEAT defines the listing process as

[269] Convention on the Conservation of Migratory Species of Wild Animals is also known as the Bonn Convention and aims to conserve terrestrial, aquatic and avian migratory species throughout their range. More information can be found at www.cms.int.
[270] Article 7 of the CBD.

> legal instrument, which will be used to regulate "restricted activities" to be carried out with a listed threatened or protected species. The criteria and assessment process applied to listing species in terms of the Act, is completely different to the assessment process followed in the Red Data Listings.[271]

Mammal species that have been listed in the ToPS list differ from those listed in the *Red Data Book of Mammals of South Africa* as only two species are listed as Critically Endangered; nine listed as Endangered; 14 listed as Vulnerable; and 14 listed as Protected species. Of concern is that there is a considerable drop in the number of threatened mammal species included in the former list. This alludes to the fact that according to the ToPS list, fewer mammal species listed in the Red Data Book are directly and detrimentally affected due to the impact of restricted activities. Another concern is that the ToPS list does not offer concise definitions of the threat categories and as such are rather vague and subjective. It is unclear what the terms 'extremely high', 'high', 'medium-term', and 'near future' actually mean. This is in contrast to IUCN Red Lists which are compiled according to clear, concise and objective definitions of threat categories.

4.3.2 *Draft* List of Critically Endangered, Endangered, Vulnerable and Protected Ecosystems

Although in this case *species* are not listed, the listing of threatened ecosystems is a similar legal tool that may be used to protect species and ecosystems that are situated outside of protected areas. Furthermore, as with the listing of threatened species, the purpose of listing threatened ecosystems is to reduce the rate of ecosystem and species destruction and extinction as they are sites which contain exceptionally high conservation value. Sections 52 to 55 of NEMBA empower the Minister to publish a national list of threatened ecosystems which he has now completed albeit in draft form.[272] This national listing process is to

[271] Species Listing Newsletter Vol. I, Issue III. DEAT. 21 February 2005 page 3.
[272] Contained in General Notice 1477 of 2009 published in *Government Gazette* 32689 dated 6 November 2009.

take on a phased approach, starting with the listing of threatened ecosystems in the terrestrial environment. The listing of rivers, wetlands, estuarine and marine ecosystems will take place in subsequent phases.

The ecosystems that were identified as threatened were based on one of the following broad spatial scale units: the South African Vegetation Map, national forest types recognised by the Department of Water Affairs and Forestry (DWAF), priority areas identified in a provincial systematic biodiversity plan, or high irreplaceability forests patches or clusters systematically identified by DWAF. Led by SANBI and developed through consultation with provincial conservation authorities, DWAF and other experts, the identified threatened terrestrial ecosystems were then classified according to levels of threat. The terminology used to define categories of threat for ecosystems is the same terminology used for the ToPS list and therefore that of the IUCN Red List, however the definitions differ.

The categories are defined as follows:

- **critically endangered (CR) 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 (EN) 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 (VU) 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;

- **protected ecosystems**, being ecosystems that are of high conservation value or of high national or provincial importance, although they are not listed as critically endangered, endangered or vulnerable.[273]

Currently, ecosystems are defined at a local rather than the regional scale and over time it is hoped that a finer spatial scale would be used. Criteria were identified using the best scientific information available and through the development of an extensive consultation process between provincial conservation authorities, DWAF and other experts. Ecosystems had to only meet one of the criteria to be listed and an ecosystem's threat status would be based on the highest ranking criterion.

Table 3: Criteria used to identify threatened terrestrial ecosystems, with thresholds for critically endangered (EN), endangered (EN) and vulnerable (VU) ecosystems

Criterion	CR	EN	VU
A1:Irreversible loss of natural habitat	Remaining natural habitat = biodiversity target	Remaining natural habitat = (biodiversity target + 15%)	Remaining natural habitat = 60% of original area of ecosystem
A2: Ecosystem degradation and loss of integrity*	= 60% of ecosystem significantly degraded	= 40% of ecosystem significantly degraded	= 20% of ecosystem significantly degraded
B: Rate of loss of natural habitat**			
C: Limited extent and imminent threat**			
D1:Threatened plant species associations	= 80 threatened Red Data List plant species	= 60 threatened Red Data List plant species	= 40 threatened Red Data List plant species
D2: Threatened animal species associations**			
E: Fragmentation**			

[273] Section 3.1.1 of General Notice 1477 of 2009 published in *Government Gazette* 32689 dated 6 November 2009 page 21.

F: Priority areas for meeting explicit biodiversity targets as defined in a systematic biodiversity plan	Very high irreplaceability and high threat	Very high irreplaceability and medium threat	Very high irreplaceability and low threat

* Because of data constraints, Criteria A2 and C have been applied to forests but not to other vegetation types.
** Because of data constraints, Criteria B and D2 are dormant at this stage and thresholds have not been set for these criteria. Further testing of Criterion E is needed to determine whether it is a workable criterion for terrestrial ecosystems. Criterion E may be applied in the future to most terrestrial ecosystems, but will not be applied to forest ecosystems as the forest biome is naturally fragmented.

Source: Department of Environmental Affairs (2009)[274]

The above table includes six criteria that are used to identify threatened terrestrial ecosystems. Four are used in the current phase of listing (A, C, D and F) and the remaining two (B and E) are undeveloped due to a lack of data. The thresholds shown in the table determine the category of threat into which a threatened ecosystem is to be assigned.

Currently, listed ecosystems make up 9.5% of South Africa with critically endangered, endangered and vulnerable accounting for 0.7%, 2% and 6.8% respectively. DEAT has identified four main implications of listing an ecosystem: planning relating implications; environmental authorisation implications; proactive management implications; and monitoring and reporting implications.[275] Regarding environmental authorisations, listed ecosystems should be included as sensitive areas in EIA supplementation maps. Moreover, listed ecosystems should be incorporated into Environmental Management Frameworks and should include restrictions on any loss of natural habitat particularly in critically endangered and endangered ecosystems.

The following chapter contains a critical assessment of the Red Data Lists and the ToPS list in protecting and conserving South Africa's biodiversity.

[274] General Notice 1477 of 2009 dated 6 November 2009
[275] Ibid.

Chapter 5: Research Findings

5.1 Critical analysis of the IUCN Red Data lists of threatened species

It is apparent that the listing of species approach is a vitally important instrument in the protection and conservation of biodiversity in South Africa. South Africa makes use of two types of TSLs namely, the Red Data Lists (a development of the IUCN Red List) and the ToPs list. These two lists may have their differences but the overall goal remains the same – identifying and conserving species that are threatened with extinction.

Threatened species lists can be used for three main purposes, to determine the extinction risk or conservation risk of species based on objective and empirical data; to ascertain species as a conservation priority by combining ecological data with socio-economic imperatives and other subjective data; and to regulate the conservation of listed species through the use of normative tools such as the promulgation of legislation over biodiversity loss and the impact of anthropocentric activities on biodiversity.[276]

The latest South African version of the Red Data Book titled *Red Data Book for Mammals of South Africa: a Conservation Assessment* was published in 2004 and included assessments done to both marine and terrestrial mammals (including sub-species) and made use of latest version of the IUCN's Red List Categories and Criteria (version 3.1, 2001). The South African mammal Red Data Book assisted in determining conservation priority species and was useful in informing species to be included in the ToPS list. Hence, it enabled authorities to carry out the two other possible applications of the IUCN Red List, namely to guide conservation priority setting and to information normative rules for legislating biodiversity conservation.

[276] Grammont and Cuarón, op cit page 14.

Although most TSLs do not offer legally enforceable protection for species, they do offer a multitude of other advantages. First, they consist of empirical quantitative data compiled from biological factors that is transparent, repeatable, independent and objective. Data collected for the IUCN Red List is extremely valuable and of the highest standard and is used to inform and influence conservation policies and the promulgation national and international legislation. Secondly, information gathered from national and regional lists is added to the IUCN Global Red Data List which is accessible and available free to anyone with an internet connection. Third, they stimulate research; fourth, they assist in regulating development and the exploitation of resources; fifth, they target geographical areas for conservation planning; sixth, they help in increasing public awareness of human impacts on biodiversity; seventh, they advise authorities on how best to allocate limited conservation resources; and finally TSLs are used to report on the state of the environment and may be used to indicate changes in the status of biodiversity.[277]

Despite all the above advantages of Red Data Lists, care should be taken when applying the IUCN Red List Criteria (2001) to the compilation of national or regional lists. Regional populations that are isolated from the same species populations outside the region can be assessed without having to modify the criteria as the extinction rate would be identical to that of an endemic species. Modifications to the criteria are required when assessing groups of species that are defined by a geopolitical border or if a regional population occasionally interchanges with other populations beyond the border. In this case the thresholds need to be modified or an inaccurate estimate of extinction risk will result.[278]

Furthermore, with regional assessments, problems do arise regarding the population distribution of species as a species can be distributed over more than

[277] Miller et al, op cit page 685.
[278] Ginsburg, op cit page 1206.

one country thus making it difficult to determine its extinction risk. Moreover, a species may not be regarded as under threat in one country but in another country the opposite might be the case. Countries that are home to only a few endemic species where most of the species found in that country are also found elsewhere in the world may regard those non-endemic species found within their borders to be a high risk of extinction based on population numbers. Conversely, the same species that are endemic and found in abundance in another country may be classified in a lower threat category at national level as the population numbers are assessed to stable in that country. The result is different categories being assigned to the same species at national level compared to the same species at a global level.[279]

Unfortunately, only one quarter of species listed in national TSLs are also present in global lists. Seemingly, the flow of information is predominantly in the direction from global lists to national lists and not the reverse.[280] Another problem is that the definition of categories often varies amongst assessors and between countries. Terms may mean different things on different lists and this is hugely problematic when consolidating information from different countries. Ultimately, it impedes species protection on a global scale and results in national lists being of little use to the compilation of the global list. For this reason, the *Guidelines for Using the IUCN Red List Categories and Criteria* IUCN has been published to assist national and regional authorities in the compilation of their own TSLs and to reduce confusion in the definition of categories.

Threatened species lists have also been used to assist in decision making regarding the allocation of resources for species recovery. Some commentators regard this as inappropriate as in some cases allocating resources to species with the highest risk of extinction may not be the most efficient way to promote

[279] Ibid.
[280] Gärdenfors, op cit page 515.

recovery or reduce extinction rates.[281] In some cases, the chance of recovery for a species at high risk may be poor thus rendering the allocation of resources to that cause uneconomical. The threat status of a species should be one of many factors to be considered when allocating resources for species recovery.[282] TSLs are very useful in identifying high-risk ecosystems and should be used to assist in setting priorities for reserve selection. However, just because a species is considered a high risk of extinction does not automatically mean that action such as inclusion in a reserve system is necessary, or any action is required for that matter. It is not recommended to use a single threatened species as the main reason for implementing biodiversity conservation in a particular area as the endangered species may turn out to be a poor indicator of habitat value, for example the California gnatcatcher (*Polioptila c. californica*) found in Southern California.[283]

Another concern of TSLs is whether they should be used to constrain development due to adverse environmental impacts. Environmental Impact Assessments (EIAs) carried out on proposed developments may reveal that the development could increase the extinction risk of a threatened species. A number of reservations can be raised regarding the relationship between EIAs and threatened species. First, although EIAs are legally enforceable, environmental impact reports may be manipulated due to political bias. Furthermore, the subjectivity and consequently integrity of TSLs may be questioned as economic or social criteria can override scientifically based criteria. Second, a development with considerably small impacts may be curtailed due to a threatened species but a large development may be allowed to take place despite it having an enormously negative impact on a number of seemingly non-threatened species. Just because a species has not been listed

[281] Possingham et al, op cit page 503.
[282] John Lamoreux, H Resit Akçakaya, Leon Bennun, Nigel J Collar, Luigi Boitani, David Brackett, Amie Bräutigam, Thomas M Brooks, Gustavo A B da Fonseca, Russell A Mittemeier, Anthony B Rylands, Ulf Gärdenfors, Craig Hilton-Taylor, Georgina Mace, Bruce A Stein and Simon Stuart 'Value of the IUCN Red List' (2003) *Trends in Ecology and Evolution* Vol 18 No 5 page 213.
[283] Possingham et al, op cit 504.

due to it having not been assessed does not mean that the species should not be considered to be non-threatened. Finally, a species added to a TSL may increase the risk of that particular species as some affected parties may destroy its habitat or deny researchers or government authorities access to the area.[284]

In the South African context, the South African mammal Red Data Book (2004) was a remarkable improvement on its predecessor that had been published almost twenty years earlier. It made use of six threat categories where the same terminology was used as with the IUCN Red List. Disturbingly, however, of the 295 species that were included in the book, 18% of the species were classified as data deficient due to insufficient data available. This implies that possible assessor subjectivity or bias may have played a role in assigning certain species this category. Assessors may have been reluctant to give specific species a near threatened or least concern listing due to the nature of the species. For this reason, it is imperative that criteria used in assigning species to categories are objective and transparent as two different assessors must arrive at the same threat status for the same species.

Regarding CITES lists, it is important to note that these are not lists of threatened species and although they include species of conservation concern, they do not necessarily include species that have been adversely affected by habitat loss, alien species or pollution, amongst other factors.

5.2 Critical analysis of the South African Threatened or Protected Species List

The ToPS list has not been designed to provide an objective assessment of the conservation status of species but rather to regulate the protection of species under threat of extinction due to the impacts of restricted activities. Whilst the same categories as that of the IUCN Red List are used in the compilation of the ToPS list, the same criteria are not applied. Hence, the ToPs list makes use of

[284] Ibid.

different assessment criteria to that of Red Data Lists. Additionally, the definitions given to threat categories found in the ToPS list are confusing, vague and subjective. It is unclear what the terms relating to the definitions given to the threat categories such as 'extremely high', 'high', 'medium-term', and 'near future' actually mean. This is in stark contrast to IUCN Red Lists which are compiled according to clear, concise and objective definitions of threat categories.

By using different assessment criteria, the threat status given to species found on the ToPS list often leads to miscalculations of the threat status of species where the threat status of a species found in the *Red Data Book for Mammals of South Africa: A Conservation Assessment* differs to the threat status of the same species found in the ToPS list. By incorrectly categorising threatened species, the intended purpose of the ToPS list is undermined and the entire process becomes flawed.

Assessor bias and poor understanding of the criteria is also a shortcoming of the ToPS list. An example of this taking place is in the case of farmers influencing the threat status assigned to species such as the Caracal *(Caracal caracal)* and Black-backed Jackal *(Canis mesomelas)* as their population numbers are seemingly not threatened and they are simply a nuisance to farmers. Hence, which species to add to the ToPS list became a contentious issue amongst stakeholders. Clearly, the desired outcome of correctly applying the criteria for listing threatened and protected species would be to 'facilitate a listing process leading to lean and targeted species lists that will enable effective and efficient protection of species against the excessively harmful effects of any one or more of the restricted activities set out in NEMBA'.[285]

[285] Department of Environmental Affairs and Tourism Species Listing Vol. I, Issue II. 26 November 2004 page 2 accessed 14 July 2011 http://www.speciesstatus.sanbi.org/pdf/Newsletter%20Issue%202.pdf.

In order for a species to be included in the ToPS list it has to be under threat of extinction *and* it has to be under threat from the impact of a restricted activity. This means that, unlike with the IUCN Red List, by listing species in the ToPS list it is no indication of either the conservation status or threatened status of that species. Moreover, the activities themselves are regulated and not the actual species affected by the impact of the restricted activities. Any species not added to the ToPS list is often not protected by legislation. The only benefit that a species receives from being listed in the ToPS list is that it is a legally binding instrument and therefore species are legally protected against threats from restricted activities such as hunting.[286] Unfortunately, threats emanating from ecosystem transformation, destruction or disturbance to habitats or excessive resource exploitation are not taken into consideration in species-based conservation legislation.[287] This is a fundamental limitation of the ToPS list.

Another consideration is that the ToPS list does not allow for the listing of sub-species. This is problematic as in some species a more threatened subspecies requires a higher level of threat status compared a species that may not be under threat at all as in the case of the Black Rhinoceros. In this case, a subspecies of the Black Rhinoceros (*Diceros bicornis bicornis*) is under greater threat and has a higher listing that of critically endangered by the Red Data Book. The species of Black Rhinoceros (*Diceros bicornis minor*) is classified as endangered as it is threatened to a lessor degree. However, as subspecies are not provided for in the ToPS list, the lower listing for Black Rhinoceros is included in the ToPS list. This exclusion degrades the integrity of the ToPS list as it is vital that species (and subspecies) are allocated the correct threat status in order for them to receive the necessary protection they require.

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[286] Strydom & King, op cit page 109.

[287] Department of Environmental Affairs and Tourism Species Listing Vol. I, Issue II. 26 November 2004 page 4 accessed 14 July 2011 http://www.speciesstatus.sanbi.org/pdf/Newsletter%20Issue%202.pdf.

5.3 Case Law

An examination of the case law revealed that most cases dealt with permitting issues such as the issuing of licences for the hunting or harbouring of either CITES listed species or species listed in terms of provincial legislation.[288]

With regard to the protection and conservation of South Africa's biodiversity under national legislation, the case of the *South African Predator Breeders Association and Others v Minister of Environmental Affairs and Tourism* is of relevance.[289] In this case the South African Breeders Association and two other applicants challenged a decision made by the Minister of Environmental Affairs and Tourism for prohibiting the hunting of lions that are bred in captivity unless the lions have been in the wild for a period of two years. Lions (*Leo Panthera*) are listed on the ToPS list as a vulnerable species and are also defined as a 'put and take animal' in terms of the Threatened or Protected Species Regulations, 2007.[290] According to Regulation 1, a 'put and take animal' is defined as 'a live specimen of a captive bred listed large predator ... that is released for the purpose of hunting that animal within a period of twenty four months after its release from a captive environment.' Regulation 24 deals with restricted activities involving listed large predators and consequently prohibits the hunting of listed large predators that are a put and take animal.

The applicants made an application to the Free State Provincial Division of the High Court for an order reviewing the definition of 'put and take animal' and Regulation 24 on the basis that the Minister had not applied his mind to the representations put forward in the public participation process and that the

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[288] See *Vorster and Another v Department of Economic Development, Environment and Tourism, Limpopo Province, and others* 2006 (5) SA 291 (T) and *S v Mercer* (CCT43/03) [2003] ZACC 22; 2004 (2) SA 598 (CC); 2004 (2) BCLR 109 (CC).

[289] *South African Predator Breeders Association and Others v Minister of Environmental Affairs and Tourism* (1900/2007) [2009] ZAFSHC 68 and *SA Predator Breeders Association and Others v Minister of Environmental Affairs and Tourism* (72/10) [2010] ZASCA 151; [2011] 2 All SA 529 (SCA)

[290] Government Notice 152 published in *Government Gazette* 29657 dated 23 February 2007.

Minister had failed to include transitional provisions catering for the ban on hunting provided for in Regulation 24, amongst others. The High Court dismissed the claim of the applicants who subsequently appealed to the SCA.

The SCA agreed with the Minister that a twenty four month ban on hunting was a reasonable time period in which a lion could develop it natural skills in the wild in avoiding those who sought to hunt it, however, it held that there was no scientific basis for that assumption and therefore it could not be justified. The scientific panel that advised the Minister had also revealed that preventing the hunting of captive-bred lions would not assist in the management and conservation of South Africa's biodiversity and the protection of species, or assist in the survival of lions. The Court also agreed that the applicants' complaint about the lack of transitional provisions was justified and in conclusion upheld the appeal in relation to the invalidity of the Regulations preventing the hunting of captive-bred lions.

Chapter 6: Concluding Remarks and Recommendations

The IUCN Red List is a highly respected source of information that is widely accepted due to its objective and authoritative system which is freely available to anyone anywhere in the world. The *Red Data Book for Mammals of South Africa: A Conservation Assessment* is premised on the IUCN Red List and makes use of the same categories and criteria as the international version. A major shortcoming of the Red Data Book is that it currently is not legally enforceable. However, Red Data Lists do play a major role in informing policies and legislation.

The ToPS list is legally enforceable but limited to protecting only those species that may be under threat of extinction due to the impacts of restricted activities. Whilst the same categories as those of the IUCN Red List are used in the compilation of the ToPS list, the same criteria are not applied. This is problematic and confusing and in some cases the incorrect categories are assigned to threatened species. Furthermore, species are selected on a predominantly subjective basis and the list is fraught with inconsistencies, assessor bias, political and social interference. It is clear that a more objective and transparent listing process is required for the compilation of the ToPS list.

The criteria for listing species on the ToPS lists must be expanded to include all species that are adversely impacted due to ecosystem transformation, destruction or disturbance to habitats or excessive resource exploitation. This amendment would greatly improve the credibility and legitimacy of the ToPS list. Furthermore, all efforts should be made to ensure that the ToPS list is correctly administered and enforced and that adequate checks and balances are put in place to prevent the exploitation and mismanagement of the list.

It is imperative that all threatened species lists are regularly updated, that the criteria are correctly applied, and that species are assigned their correct threat

status. Changes in threat status, whether higher or lower, must be reflected in the most current data. Improvements must be made in the flow of information between national and global lists and all efforts must be made to ensure that species are included in both lists and that they are assigned the same threat status. Greater co-operation and understanding between the IUCN and national and regional governments is required and the IUCN must continue to assist regional and national governments with understanding and implementing the IUCN criteria set out in the *Guidelines for Using the IUCN Red List Categories and Criteria, 2001*.

It would also be advisable to produce a complete inventory of all species inhabiting the world whether they are threatened or not. Having said that, due to a limitation of resources, this may not be possible or advisable as it may detract from the principle purpose of assigning limited resources to protecting those species that desperately require protection as they are currently under threat of extinction. Although species are the cornerstone of biodiversity, the important role of ecosystems must not be overlooked. Perhaps it would be of greater value to focus on ecosystem protection and not simply concentrate on the protection of threatened species. The fact that the Department of Environmental Affairs has published a draft list of critically endangered, endangered, vulnerable and protected ecosystems is an indication of the important role that ecosystems have to play in the survival of species.

South Africa is one of the most biologically diverse countries in the world and we all have an obligation to ensure the protection and conservation our biodiversity for the benefit of present and future generations. An abundance of national and provincial legislation currently exists and the listing of threatened species is just one of many environmental management tools that if correctly applied can assist us in carrying out this obligation.

In conclusion, and on a somber note, although this study has shown that the listing of threatened species approach has its merits as a useful tool in assessing

the threat status of species thereby assisting in the protection and conservation of our biodiversity, environmental compliance and enforcement mechanisms have to work in parallel with threatened species lists order for the value of threatened species lists to be recognised. Environmental Management Inspectors must be provided with adequate resources in order to carry out their duties. After all, if our environmental laws are not correctly implemented and enforced they become redundant and useless and the consequences thereof become too horrific to comprehend.

Annexure

NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT 10 OF 2004

PUBLICATION OF LISTS OF CRITICALLY ENDANGERED, ENDANGERED, VULNERABLE AND PROTECTED SPECIES

Published under Government Notice R151 in *Government Gazette* 29657 of 23 February 2007 and amended by

GN R1187 GG 30568 2007/12/14

By virtue of the powers vested in me under section 56(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004), I, Marthinus van Schalkwyk, Minister of Environmental Affairs and Tourism, hereby publish lists of critically endangered, endangered, vulnerable and protected species as set out in the schedule hereunder.

MARTHINUS VAN SCHALKWYK
MINISTER OF ENVRONMENTAL AFFAIRS AND TOURISM

SCHEDULE

CATEGORY: Critically Endangered Species - Indigenous species facing an extremely high risk of extinction in the wild in the immediate future	
Scientific Name	**Common Name**
PISCES	
Labeo seeberi	Clanwilliam Sandfish
REPTILIA	
Caretta caretta	Loggerhead Sea Turtle
Dermochelys coriacea	Leatherback Sea Turtle
Eretmochelys imbricate	Hawksbill Sea Turtle
AVES	
Grus carunculatus	Wattled Crane
Hirundo atrocaerulea	Blue Swallow
Neophron percnopterus	Egyptian Vulture
Poicephalus robustus	Cape Parrot

MAMMALIA	
Bunolagus monticularis	Riverine Rabbit
Chrysospalax villosus	Rough-haired Golden Mole
FLORA	
Adenium swazicum	Swaziland Impala Lily
Aloe pillansii	False Quiver Tree
Diaphananthe millarii	Tree Orchid
Dioscorea ebutsiniorum	Wild Yam
Encephalartos aemulans	Ngotshe Cycad
Encephalartos brevifoliolatus	Escarpment Cycad
Encephalartos cerinus	Waxen Cycad
Encephalartos dolomiticus	Wolkberg Cycad
Encephalartos heenanii	Woolly Cycad
Encephalartos hirsutus	Venda Cycad
Encephalartos inopinus	Lydenburg Cycad
Encephalartos latifrons	Albany Cycad
Encephalartos middelburgensis	Middelburg Cycad
Encephalartos nubimontanus	Blue Cycad
Encephalartos woodii	Wood's Cycad

CATEGORY: Endangered Species - Indigenous species facing a high risk of extinction in the wild in the near future, although they are not a critically endangered species

Scientific Name	**Common Name**
INVERTEBRATA	
Colophon spp - All species	Stag Beetles
PISCES	
Barbus andrewi	Whitefish
Barbus serra	Sawfin
Pristis microdon	Largetooth Sawfish
REPTILIA	
Chelonia mydas	Green Turtle
Cordylus giganteus	Giant Girdled Lizard
Lepidochelys olivacea	Olive Ridley Turtle
Psammobates geometricus	Geometric Tortoise
AVES	
Anthropoides paradiseus	Blue Crane
Balearica regulorum	Grey Crowned Crane

Ephippiorhynchus senegalensis	Saddle-billed Stork
Gypaetus barbatus	Bearded Vulture
Gyps africanus	White-backed Vulture
Gyps coprotheres	Cape Vulture
Necrosyrtes monachus	Hooded Vulture
Pelecanus rufescens	Pink-backed Pelican
Scotopelia peli	Pel's Fishing Owl
Torgos tracheliotus	Lappet-faced Vulture
MAMMALIA	
Amblysomus robustus	Robust Golden Mole
Damaliscus lunatus	Tsessebe
Diceros bicornis	Black Rhinoceros
Equus zebra	Mountain Zebra
Lycaon pictus	African Wild Dog
Neamblysomus gunningi	Gunning's Golden Mole
Ourebia ourebi	Oribi
Paraxerus palliates	Red Squirrel
Petrodromus tetradactylus	Four-toed Elephant-shrew
FLORA	
Angraecum africae	Tree Orchid
Encephalartos arenarius	Dune Cycad
Encephalartos cupidus	Blyde River Cycad
Encephalartos horridus	Eastern Cape Blue Cycad
Encephalartos laevifolius	Kaapsehoop Cycad
Encephalartos lebomboensis	Lebombo Cycad
Encephalartos msinganus	Msinga Cycad
Jubaeopsis caffra	Pondoland Coconut
Siphonochilus aethiopicus	Wild Ginger
Warburgia salutaris	Pepper-bark Tree
Newtonia hilderbrandi	Lebombo Wattle

CATEGORY: Vulnerable Species - Indigenous species facing a high risk of extinction in the wild in the medium-term future, although they are not a critically endangered species or an endangered species

Scientific Name	**Common Name**
INVERTEBRATA	
Peripatopsis alba	White Cave Velvet Worm
PISCES	
Epinephelus andersoni	Catface Rockcod
Labeobarbus capensis	Clanwilliam Yellowfish

Labeobarbus kimberleyensis	Vaal-Orange Largemouth Yellowfish
Myxus capensis	Freshwater Mullet
Oreochromis placidus	Black Tilapia
Serranochromis meridianus	Lowveld Largemouth
AVES	
Trigonoceps occipitalis	White-headed Vulture
Aquila rapax	Tawny Eagle
Ardeotis kori	Kori Bustard
Ciconia nigra	Black Stork
Circaetus fasciolatus	Southern Banded Snake Eagle
Eupodotis caerulescens	Blue Korhaan
Falco fasciinucha	Taita Falcon
Falco naumanni	Lesser Kestrel
Falco peregrinus	Peregrine Falcon
Geronticus calvus	Bald Ibis
Neotis ludwigii	Ludwig's Bustard
Polemaetus bellicosus	Martial Eagle
Terathopins ecaudatus	Bateleur
Tyto capensis	Grass Owl
MAMMALIA	
Acinonyx jubatus	Cheetah
Cercopithecus mitis	Samango Monkey
Chrysospalax trevelyani	Giant Golden Mole
Cricetomys gambianus	Giant Rat
Damaliscus pygargus pygargus	Bontebok
Dendrohyrax arboreus	Tree Hyrax
Hippotragus equinus	Roan Antelope
Manis temminckii	Pangolin
Neamblysomus julianae	Juliana's Golden Mole
Neotragus moschatus	Suni
Otomops martiensseni	Large-eared Free-tailed Bat
Panthera leo	Lion
Panthera pardus	Leopard
Philantomba monticola	Blue Duiker
FLORA	
Aloe albida	Grass Aloe
E. cycadifolius	Winterberg Cycad
Encephalartos eugene-maraisii	Waterberg Cycad
Encephalartos ngoyanus	Ngoye Dwarf Cycad
Merwilla plumbea	Blue Squill
Zantedeschia jucunda	Yellow Arum Lily

CATEGORY: Protected Species — Indigenous species of high conservation value or national importance that require national protection	
Scientific Name	**Common Name**
INVERTEBRATA	
Aloeides clarki	Coega Copper Butterfly
Ceratogyrus spp - All species	Horned Baboon Spiders
Echinodiscus bisperforatus	Pansy Shell
Dromica spp - All species	Tiger Beetles
Graphipterus assimilis	Velvet Ground Beetle
Hadogenes spp - All species	Flat Rock Scorpions
.....	.....
Harpactira spp - All species	Common Baboon Spiders
Ichnestoma spp - All species	Fruit Chafer Beetles
Manticora spp - All species	Monster Tiger Beetles
Megacephala asperata	Tiger Beetle
Megacephala regalis	Tiger Beetle
Nigidius auriculatus	Stag Beetle
Oonotus adspersus	Stag Beetle
Oonotus interioris	Stag Beetle
Oonotus rex	Stag Beetle
Oonotus sericeus	Stag Beetle
Opisthacanthus spp - All species	Creeping Scorpions
Opistophthalmus spp - All species	Burrowing Scorpions
Platychile pallida	Tiger Beetle
Prosopocoilus petitclerci	Stag Beetle
Prothyma guttipennis	Tiger Beetle
Pterinochilus spp - All species	Golden Baboon Spiders
AMPHIBIA	
Pyxicephalus adspersus	Giant Bullfrog
Pyxicephalus edulis	African Bullfrog
PISCES	
Anchichoerops natalensis	Natal Wrasse
Brycinus lateralis	Striped Robber
Carcharodon carcharius	Great White Shark
Epinephelus lanceolatus	Brindle Bass
Epinephelus tukula	Potato Bass
Hydrocynus vittatus	Tigerfish
Latimeria chalumnae	Coelacanth
.....	.....
Nothobranchius orthonotus	Spotted Killifish
Nothobranchius rachovii	Rainbow Killifish

.....	.....
Pristis zijsron	Longcomb Sawfish
Varicorhinus nelspruitensis	Incomati Chiselmouth
REPTILIA	
Bitis gabonica	Gaboon Adder
Bitis schneideri	Namaqua Dwarf Adder
Bradypodion taeniabronchum	Smith's Dwarf Chameleon
Cordylus cataphractus	Armidillo Girdled Lizard
Crocodylus niloticus	Nile crocodile
Python natalensis	African Rock Python
AVES	
Bucorvus leadeateri	Southern Ground-Hornbill
Circus ranivorus	African Marsh Harrier
Neotis denhami	Denham's Bustard
Spheniscus demersus	Jackass Penguin
MAMMALIA	
Aonyx capensis	Cape Clawless Otter
Atelerix frontalis	South African Hedgehog
Ceratotherium simum	White Rhinoceros
Connochaetes gnou	Black Wildebeest
Crocuta crocuta	Spotted Hyaena
Felis nigripes	Black-footed Cat
Parahyaena brunnea	Brown Hyaena
Leptailurus serval	Serval
Loxodonta africana	African elephant
Lutra maculicollis	Spotted-necked Otter
Mellivora capensis	Honey Badger
Raphicerus sharpei	Sharpe's Grysbok
Redunca arundinum	Reedbuck
Vulpes chama	Cape Fox
FLORA	
Adenia wilmsii	No common name
Aloe simii	No common name
Clivia mirabilis	"Oorlogskloof" Bush Lily
Disa macrostachya	No common name
Disa nubigena	No common name
Disa physodes	No common name
Disa procera	No common name
Disa sabulosa	No common name
E. umbeluziensis	No common name
E. villosus	Poor man's cycad

Encephalartos altensteinii	Bread Palm
Encephalartos caffer	Breadfruit Tree
Encephalartos dyerianus	Lowveld Cycad
Encephalartos friderici-guilielmi	No common name
Encephalartos ghellinckii	No common name
Encephalartos humilis	No common name
Encephalartos lanatus	No common name
Encephalartos lehmannii	No common name
Encephalartos longifolius	No common name
Encephalartos natalensis	Natal Giant Cycad
Encephalartos paucidentatus	No common name
Encephalartos princeps	No common name
Encephalartos senticosus	No common name
Encephalartos transvenosus	Modjadje Cycad
Encephalartos trispinosus	No common name
Euphorbia clivicola	No common name
Euphorbia meloformis	No common name
Euphorbia obesa	No common name
Harpagophytum procumbens	Devil's Claw
Harpagophytum zeyherii	Devil's Claw
Hoodia gordonii	Ghaap
Hoodia currorii	Ghaap
Protea odorata	Swartland Sugarbush
Stangeria eriopus	No common name

[Schedule amended by GN R1187/2007]

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