

ecosystem management plan: guide tool



Prepared for:

Western Cape Conservation Stewardship Association (WCCSA) & CapeNature

By:

The Nature Conservation Corporation

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A set of 7 Ecosystem Management Plans (EMPS) were commissioned by the **Western Cape Conservation Stewardship Association (WCCSA)** as part of a conservation stewardship project. The project is funded by the Critical Ecosystems Partnership Fund (CEPF) through the C.A.P.E. Initiative and co-funded by CapeNature and The Nature Conservation Corporation.



Ecosystem Management Plan: Guide Tool



Coastal Ecosystem Management Plan: Western Cape



Forest Ecosystem Management Plan: Western Cape



Fynbos Ecosystem Management Plan: Western Cape



Karoo Ecosystem Management Plan: Western Cape



Renosterveld Ecosystem Management Plan: Western Cape



Aquatic Ecosystem Management Plan: Western Cape



Thicket Ecosystem Management Plan: Western Cape



This EMP Guide Tool is to be used in conjunction with the Ecosystem Management Plans, providing information applicable to all the EMPs, instead of duplicating these in each.

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introduction

The Cape Floristic Region has been identified as one of the critical biological hotspots on earth. Succinctly paraphrased from Goldblatt & Manning (2000), it comprises an area of 90 000km² and contains a staggering 9000 plant species of which 69% are endemic. Furthermore, it contains five endemic families namely Penaeaceae, Stilbaceae, Grubbiaceae, Roridulaceae and Geissolomataceae with a further three near-endemic families i.e. Bruniaceae, Lanariaceae and Prionaceae. If the statistics alone are not sufficient to convince one of its opulence and uniqueness then a short walk in Cape Fold Mountains will soon convey the message. The stupendous variety, even within a single genus, will leave one with little doubt that the Cape Floristic Region is indeed one of the world's remarkable botanic wonders.

Although there is an extensive network of proclaimed protected areas in the Cape Floristic Region, they do not adequately represent the biodiversity of the CFR. With the unnaturally accelerated process of cyclic climate change a reality, we need to make provision for biodiversity to evolve. Exactly what this new set of biodiversity is that will arise, depends on the space and diversity available to start with. It is essential that landowners continue to contribute to biodiversity conservation. The analogy of formal protected areas being the reserve fuel tank best describes this necessity. Together formally protected areas and private untransformed land is the fuel tank for ecosystem functioning and biodiversity evolutionary processes. Whilst driving, and especially through un-chartered territory with unpredictable weather, no-one wants to be in a situation where all you have left is your reserve tank.

Whilst we need to conserve as large and varied an area as possible, we also need to ensure that the ecosystem processes and species diversity are maintained at their highest possible level. To this end, generic Ecosystem Management Plans (EMP) have been compiled to assist the landowner in doing so.



how to use the EMP

what is an EMP

An EMP is a tool with which to plan and systematically perform management interventions to ensure that adverse impacts are negated and the ecosystem can continue functioning in a natural or as-near-natural state as possible. The management plan is intended to better inform decisions on responsible land management by clearly stating the management objectives, scheduling action and providing standard operating procedures and guidelines. An EMP should not be viewed as cast-in-stone but rather a flexible and dynamic document that should be constantly reviewed and improved as understanding increases.

A site specific **Environmental Management Plan** should be developed where necessary, as the **Ecosystem Management Plans** in no way encompass all site relevant management actions.

principles

key issues

We are all fundamentally aware of the ecosystem-defining processes that operate on a global and regional scale, such as climate, that have created and shaped the ecosystem as we know them. These are referred to as ecosystem drivers. On a local scale there are many more drivers that contribute towards the dynamic nature of an ecosystem. In order to avoid confusion with over-arching drivers that are more appropriately discussed and conserved on a regional scale, the smaller local drivers are referred to in the EMP's as "key issues". The reason for this terminology is that these drivers are easily impacted by actions on a local scale and they form the basis of the management interventions.

surrogates

In order to expedite biodiversity assessments and conservation planning, surrogates have been identified that will relay the necessary information without the need for costly and complex full surveys. Vegetation is a recognised surrogate for biodiversity assessments. This relies on the principle that if the vegetation is in good stead, the ecosystem and associated biodiversity is too.



component vs. ecosystem approach

Managing a component of an ecosystem or one of its processes without regard for the rest of the ecosystem is a disaster waiting to unfold. An example is flow regime in an estuary. Too often an estuary is mechanically breached to reduce water levels that are threatening to flood houses built within the 1:50 flood levels. The knock-on effect is reduced recruitment of fish that require estuaries as nurseries such as steenbras *Lithognathus lithognathus*. Another example is implementing fire frequencies to favour recruitment of fynbos species popular in the cut flower industry. This reduces species diversity and may adversely affect recruitment after a wildfire.

The requirements of an ecosystem as whole need to be taken into account and any management actions should be based on this. Management therefore needs to be holistic.

precautionary principle

The precautionary principle hinges on two imperative concepts – *first do no harm* and *stop the causal factors*. *First do no harm* is self-explanatory and can be used in conjunction with *if it's not broken don't fix it* maxim. Often protected areas are over-managed and become science projects surrounded by a fence. We were recently told of an area of arid fynbos that was intentionally burned by the landowner because he was under the impression that fynbos must burn. Three years have passed and there is still almost no recruitment.

'*Stop the causal factors*' implies that intrusions into the ecosystem must be halted or managed so that they cease to have negative impact.

natural capital

Natural capital refers to ecosystem components that provide us with resources. These include water, grazing and browse, cut flowers, thatch – in short any component or product thereof that can sustain or economically benefit society.



implementation of the EMP

Merely having an EMP doesn't change anything. The real value lies in the implementation thereof. Implementing this tool would contribute towards conserving ecosystems and their vital processes, thereby enhancing quality of life.

These EMPs must be used together with Best Practice Guidelines (BPG) developed for additional specific issues/management actions e.g. *BPG Alien Vegetation Management* and *BPG Fire Management*.

create an annual work schedule (planning, development and implementation)

Given the complexity and longevity of management programmes it is essential to tackle them in a systematic manner. Answers to the following questions will provide the data required for each project.

what must be done

What is the management objective to be achieved?

Describe the action required in order to achieve the objective

why must it be done

Certain management interventions must be implemented, in order to achieve certain objectives.

where must it be done

Specify the management block/zone requiring the management intervention, and if too large an area, mention landmarks or co-ordinates for better reference.

when must it be done

A specific timeframe (start and end date) must be attached to an activity. Certain activities are seasonal be implemented in the specified suitable seasons, some would have different levels of urgency, in summary, specify the timeframe for the activity to be implemented.

how must it be done

State the method to be used and if necessary describe the method of implementation/application as well as the resources required.



who must implement/do it

List the responsible person/authority to implement or oversee the implementation of each activity, and where necessary, who is to obtain the funding/budget.

Certain management interventions and development projects might require permission from the relevant authorities, where the implementation of these may involve negative impacts on the natural environment. See below for environmental legislation which may be of relevance to you.

applicable environmental legislation

national legislation

Landowners should comply with all of the statutes listed and other applicable national government policies and programmes. This is the primary national environmental legislation that could be relevant:

- The Constitution of South Africa Act of 1996 (Act No. 108 of 1996);
- National Environmental Management Act of 1998 (Act No. 107 of 1998) and the new Integrated Environmental Management Regulations promulgated in terms of Section 24 thereof;
- Environment Conservation Act of 1989 (Act No. 73 of 1989)
- The White Paper on Environmental Management Policy for South Africa;
- White Paper on the Conservation and Sustainable Use of South Africa's Biological Diversity, 1997;

land, soil & plants

- The Conservation of Agricultural Resources Act of 1983 (Act No. 43 of 1983);
- The National Environmental Management Biodiversity Act (Act No. 10 of 2004);
- National Veld and Forest Fire Act of 1998 (Act No. 101 of 1998);

animals & wildlife

- Animals Protection Act of 1962 (Act No. 71 of 1962);
- Agricultural Pests Act of 1983 (Act No. 36 of 1983);



protected areas

- National Environmental Management: Protected Areas Act of 2003 (Act No. 57 of 2003);

pollution control & waste management

- White Paper on Integrated Pollution and Waste Management for South Africa;
- Draft National Environmental Management: Waste Management Bill
- The Environment Conservation Act of 1989 (Act No. 73 of 1989)

inland water resources

- National Water Act of 1998 (Act No. 36 of 1998);
- Water Services Act of 1997 (Act 108 of 1997);
- Mountain Catchment Areas Act of 1970 (Act No. 63 of 1970);

cultural resources

- Natural Heritage Resources Act of 1999 (Act No. 25 of 1999);

air pollution

- National Environmental Management: Air Quality Act of 2004 (Act No. 39 of 2004);
- Atmospheric Pollution Prevention Act of 1965 (Act No. 45 of 1965)

hazardous & toxic substances

- Hazardous Substances Act of 1973 (Act No. 15 of 1973);
- Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act of 1947 (Act No. 36 of 1947);

noise

- Noise Control Regulations GN R154 in Government Gazette No. 13717 of 10 January 1992 (made in terms of Section 25 of the Environment Conservation Act of 1989 (Act No. 73 of 1989))
- Advertising on Roads and Ribbon Development Act of 1940 (Act No. 21 of 1940)



marine/seashore

- Integrated Coastal Zone Management Bill (14 December 2006);
- Regulations on the Control of Vehicles in the Coastal Zone (promulgated in terms of section 44 of NEMA) Government Notice 1399 in Government Gazette 22960 of 21 December 2001 (as amended);
- White Paper for Sustainable Coastal Development in South Africa April 2000;
- Sea-shore Act of 1935 (Act No. 21 of 1935);
- Marine Living Resources Act of 1998, (Act No. 18 of 1998);

provincial and municipal environmental legislation

- Constitution of the Western Cape, 1997;
- Western Cape Nature Conservation Laws Amendment Act 3 of 2000;
- Western Cape Nature Conservation Regulations promulgated in terms of Section 82 of the 1974 Ordinance
- Municipal Structures Act of 1998 (Act No. 117 of 1998)
- Municipal Systems Act of 2000 (Act No. 32 of 2000)

external funding channels

The basic tasks required for maintaining the natural area are generally at the account of the landowner. If **external funding** is required for certain management projects, it is recommended that a short but comprehensive business plan be compiled including:

- a) the purpose and objective of the project,*
- b) the means/method of execution,*
- c) the budget required, and*
- d) a report back after the project is implemented.*

Assistance with alien vegetation clearing can be sought from projects such as **Working for Water & Wetlands** which are concerned with potential fire threat to property and conservation of biodiversity areas, and from the Department of Agriculture's **LandCare** programme concerned with alien vegetation encroachment in agricultural areas.



Organisations that can be approached for advice or funding assistance, include:

TMF

The Table Mountain Fund (TMF) is a small-grants fund designed to provide a sustainable source of funding to support biodiversity conservation within the Cape Floral Kingdom. If you would like to know more about the TMF, or apply for funding, visit <http://www.wwf.org.za/tmf.htm> or contact at:

Tel: 021 762 8525

E-mail: tallan@wwf.org.za.

Rowland & Leta Hill Trust (administered by WWF)

Postal address:

WWF South Africa

Private Bag X2

Die Boord

Stellenbosch 7613

Tel: +27 021 888 2800

Fax: +27 021 888 2888

C.A.P.E.

Cape Action for People and the Environment is a programme of the South African Government, with support from international donors, to protect the rich biological heritage of the Cape Floristic Region (CFR). C.A.P.E seeks to unleash the economic potential of land and marine resources through focused investment in development of key resources, while conserving nature and ensuring that all people benefit.

For more information on the programme, contact at:

Private Bag X7, Claremont, 7735

Western Cape, South Africa

Tel: +27 021 799 8790

Fax: +27 021 797 3475

Email: info@capeaction.org.za



Working for Water

Working for Water aims to enhance water security, improve ecological integrity, restore the productive potential of land and promote sustainable use of natural resources, and to invest in the most marginalized sectors of South African society. It aims to tackle the problem of invading alien plants while at the same time addressing unemployment among less skilled people, focussing mainly on rural women, the youth and the disabled.

Tel: (021) 441 2700 or 0800 005 376

Fax: (021) 441 2781

E-mail: wfw@dwaf.gov.za

<http://www.dwaf.gov.za/wfw/>

Working for Wetlands

The **Working for Wetlands** Programme is a labour-intensive initiative to conserve and restore wetlands in South Africa. The Programme aims to provide advice and assistance to those with wetlands on their properties. It is also part of the Government's commitment to pro-poor interventions, and particularly the provision of work in the Expanded Public Works Programme. Working for Wetlands is to be administered through the National Biodiversity Institute, under the Department of Environmental Affairs and Tourism, in partnership with the departments of Water Affairs and Forestry and of Agriculture.

Contact: (012) 843 5000

LandCare (Department of Agriculture)

ELSENBURG

Land Use and Soil Management - Tel 021 808 5099

WEST COAST - Tel. (022) 433 2272

CAPE WINELANDS DISTRICT - Tel. (021) 873 1135

EDEN DISTRICT - Tel. (044) 803 3700

CENTRAL KAROO DISTRICT - Tel. (044) 803 3700

OVERBERG DISTRICT - Tel. (044) 803 3700



useful websites

www.parks-sa.co.za

South African National Parks

<http://cpu.uwc.ac.za>

SA National Biodiversity Institute GIS Unit

<http://www.capegateway.gov.za>

Department of Environmental Affairs & Development Planning

<http://www.capenature.co.za>

CapeNature

www.botanicalsociety.org.za

Botanical Society of South Africa

*The contact details above were correct at time of final print.

acronyms & glossary

The list below is applicable to all EMPs.

Aeolian	Pertains to the activity of the winds and its ability to shape. Wind may erode, transport and deposit materials. This process is important in arid environments.
Afromontane	Regions of high altitude in the mountains of Africa - sometimes interchangeable with 'afrotemperate'.
Alluvial	Soils developed from recent alluvium.
Alluvium	Sedimentary material found in regions fringing river courses and composed of detrital matter transported and deposited by the river. Plural = alluvia.
APO	Annual Plan of Operation
Aquatic	Applied to plants and animals that live in fresh water.



Asteraceous	Describing vegetation dominated by members of the daisy family (Asteraceae) e.g. asteraceous fynbos.
Batholith	A large emplacement of igneous intrusive (also called plutonic) rock that forms from cooled magma deep in the Earth's crust. Batholiths are almost always made mostly of intermediate rock-types, such as granite, quartz monzonite, or diorite.
Biodiversity	The number and variety of different species of plants, animals, fungi and micro-organisms, the genetic variability within species, and diversity of habitats and ecosystems.
Biome	A broad ecological spatial unit representing major life zones of large natural areas, and defined mainly by vegetation structure, climate, as well as major large-scale disturbance factors (such as fire).
BotSoc	Botanical Society of South Africa
Broken veld	A region characterised by rugged topography, preventing easy thoroughfare. The granite landscapes of the Succulent Karoo are a good example.
Browser	A herbivore (ungulate) which eats mainly leaves and twigs of bushy plants.
Calcareous	Pertaining to a rock or soil containing calcium carbonate, or related minerals, usually formed from shells or chemical precipitation, these soils and rocks tend to have a coastal distribution.
Calcrete	A rock formed in the soil profile at the water table when calcium carbonate accumulates and cements particles together to form a hard rock band.
C.A.P.E.	Cape Action Plan for People and the Environment
Cape Floristic Region (CFR)	One of 37 floristic regions in the world. Often referred to as the Cape Floristic Kingdom (CFK) which is one of six global floristic kingdoms.
CARA	Conservation of Agricultural Resources Act
CBC	Cape Bird Club
Carrying Capacity	The ability of a given unit of habitat to supply food, water, cover and space to a wildlife species. The largest population that the unit can support on a year-round basis, or during the most critical season.



Catchment	All the land area from mountaintop to seashore which is drained by a single river and its tributaries.
CFR/CFK	Cape Floristic Region or Cape Floristic Kingdom
CN	CapeNature (provincial conservation authority)
Critically Endangered	Category defined by the IUCN (World Conservation Union), as being the highest threat status possible, facing an extremely high risk of extinction in the wild.
Climax	That vegetation type or plant community structure that occurs at the end of the seral cycle. The climax communities might not be the end product of the succession: frequent or even rare events, such as fire, storms or harvesting, may hold communities in a stable subclimax indefinitely.
CMA	Catchment Management Authority
Cobbles	Generally rounded rock fragments with a diameter of between 64mm and 256mm, i.e. larger than a pebble and smaller than a boulder.
Community	An association of organisms, plant and animal, each occupying a certain position or ecological niche, inhabiting a common environment and interacting with each other.
Conglomerate	A sedimentary rock type consisting of rounded pebbles or small rocks cemented with sands, silts or clays into a solid rock.
Crown	the leaves and living branches of a tree
Cupressoid	Pertaining to plants with small, awl-shaped leaves which clasp the stem, resembling those of a cypress.
DEA&DP	Department of Environmental Affairs & Development Planning
DEAT	Department of Environmental Affairs and Tourism
Detritivores	Organisms that feed on dead organic matter.
DWAF	Department of Water Affairs and Forestry
ECA	Environmental Conservation Act
Ecological integrity	A diverse, healthy and productive natural system.
Ecological Reserve	The quality and quantity of water required to ensure appropriate protection of water resources, so as to secure ecologically sustainable development and use.



Ecologically sustainable	Maintaining the long-term viability of supporting ecosystem.
Ecotone	A zone in which two or more vegetation types or ecosystems merge. These areas may be rich in species.
Ecosystem	A community of plants, animals and organisms interacting with each other and with the non-living components of the environment.
Ecosystem services	The role played by ecosystems in creating a healthy environment for human beings; from the production of oxygen, to soil genesis, plants and animals as food, water detoxification and purification, etc.
Edge Effect	Response by organisms to environmental conditions created by the edge (between 2 states?)
EIA	Environmental Impact Assessment
EMP	Usually Environmental Management Plan, but in this instance Ecosystem Management Plan
Endemic	The natural distribution of an organism (plant or animal) restricted to the local environmental conditions within an area
Epiphyte	A plant which grows on another plant, but which is not parasitic and uses the other plant only as a perch for better obtaining light or nutrients e.g. some orchids
Eutrophic	Refers to soil that has suffered little or no leaching of the exchangeable basic cations (Ca, Mg, K and Na). Such soils are generally referred to as having a high base status.
FDI	Fire Danger Index
Ferricrete	A rock formed in the soil profile at the water table when iron oxides accumulates and cements grains together to form a gravelly or nodule-rich band. This may become impervious to water.
Flagship species	A species of focal interest for the general public and conservationists.
Floodplain	A flat expanse of land bordering a river channel, formed through sediment deposition and other alluvial processes, and often characterised by frequent flooding as a result of bank overspill from the river channel.



Floristic	Referring to the use of plant species composition (flora) as criterion for characterising or classifying vegetation.
FPA	Fire Protection Association
FPO	Fire Protection Officer
Frugivores	Organisms that feed on fruit.
Graminoid	A grass-like plant.
Grazer	A herbivore that eats mainly grasses.
Groundwater	Subsurface water in the zone in which permeable rocks, and often the overlying soil, are saturated under pressure equal to or greater than atmospheric.
Herbaceous	see Herbs
Herbs	Plants whose stem does not produce woody, persistent tissue and generally dies back at the end of each growing season.
Heterozygous	An organism, population or plant community, for example, that is genetically variant.
Heuweltjies	An Afrikaans name for a raised mound which is thought to have been formed by termites. With their higher calcium levels and more clayey soils, they often support distinctive plant communities.
High water mark	The highest point reached by the sea during ordinary storms occurring during the stormiest period of the year, excluding exceptional or abnormal floods.
Homogeneous habitat	A habitat consisting of a single type of plant, or at most only a few growth forms.
Hydrophilic	Water loving
Hydrophytes	Plants adapted to grow in water (also called hygrophytes)
Hygroscopic	Absorbing or attracting moisture from the air.
Inland wetlands	Freshwater (non-tidal) wetlands that can often be likened to a basin filled with soil which has an impervious layer that retains water.
Invasive species	A species of plant, animal or micro-organism that is both alien to the environment in which it lives and is destructive in some manner to this environment and its inhabitants.
IUCN	The World Conservation Union
Koppie	A small hill or rock outcrop.



Land use	The different ways in which people use the land and the study of these ways and of the processes of land-use decision-making.
Liana	A plant with long dangly stems rooted in the ground and with its leafy parts supported by the canopy.
Marsh	A wetland dominated by emergent herbaceous vegetation and which may be seasonally wet but which is usually permanently or semi-permanently flooded or saturated to the soil surface.
Microclimate	The climates of specific small areas, e.g. the areas immediately surrounding a spring.
Mutualistic	A relationship between two species of organisms in which both benefit from the association.
NatConCorp	The Nature Conservation Corporation
NEMA	National Environmental Management Act
NGO	Non-Governmental Organisations
NHRA	National Heritage Resources Act
Non-source-point pollution	Pollution originating from a number of dispersed sources, often associated with agriculture and urban areas.
Non-renewable resources	Resources, such as fossil fuels, that are not replaced or regenerated naturally within human time-scales.
Open water	Permanently or seasonally flooded areas characterised by the absence (or low abundance) of emergent plants.
Pan	An inward draining flat bottomed depression lacking an outlet usually intermittently to seasonally flooded.
Peat	Organic soil material with a particularly high organic matter content which, depending on the definition, usually has at least 20% organic carbon by weight.
Perennials	Plants which have a life cycle lasting more than two years.
Plant succession	The orderly natural sequence (succession) of development in vegetation in which one type is replaced by another as the development changes.
Point-source pollution	Pollution discharged from a specific fixed location, such as a pipe or outfall structure.



Pollution	The result of the release into air, water or soil from any process or of any substance, which is capable of causing harm to man or other living organisms supported by the environment.
Precautionary principle	Avoiding risk through a cautious approach to development and environmental management.
Red Data Species (RDB)	Plant and animal species officially listed in the Red Data Lists as being rare, endangered or threatened, as defined by the IUCN.
Rehabilitation	Making the land useful again after a disturbance. It involves the recovery of ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydrologically stable landscapes that support the natural ecosystem mosaic.
Restioid	Vegetation dominated by restios, commonly associated with Fynbos.
Ribbon development	The spatial pattern of human settlement and infrastructure that is “thinly” spread out along a line, such as a road or the shoreline.
Riparian vegetation	Vegetation occurring on the banks of a river or a stream (i.e. vegetation fringing a water body).
Riverine	Relating to or situated on a river or riverbank.
Runoff	The total water yield from a catchment including surface and subsurface flow.
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
Sclerophyllous	Referring to plants characterised by hard, woody leaves which snap rather than bend and possess high carbon to nitrogen ratios, making them unpalatable to browsers.
Seep	Usually sloping area temporarily (or permanently) waterlogged by groundwater seeping through to the surface.



Senescent	Vegetation approaching an advanced/mature age, lacking the natural disturbance which brings about renewal, which ensures biodiversity and adaptation to environmental stresses over time.
Silcrete	A conglomerate formed in the soil profile at the water table when silica (SiO ₂) accumulates and cements grains together to form a very hard rock layer
Species	A group of plants, animals or micro-organisms sharing a most recent common ancestor, with a shared set of uniquely evolved characteristics, and generally only inter-breeding with themselves.
Stratum	A horizontal layer or set of layers of rock or soil or plants within a plant community.
Succession	A series of stages in which different plants and animals colonise an area following a disturbance. The final stage of the succession is called the 'climax'.
Topography	The surface features of the land, e.g. hills, valleys, plains.
Understorey	A layer of vegetation beneath the main canopy layer.
Veld	Areas of untransformed natural vegetation.
Watercourse	A geomorphological feature characterised by the presence of a stream flow channel, a floodplain and a transitional upland fringe seasonally or permanently conveying surface water.
WCCSA	Western Cape Conservation Stewardship Association
Wetland	A seasonally, temporarily or permanently wet area, often exhibiting a specific vegetation community.



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