SANBI
Biodiversity for Life
South African National Biodiversity Institute

Using CBA Maps to support land-use planning and decision-making

CBA Maps are maps of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)

CBA Maps are a form of **strategic planning for the natural environment**, identifying a set of geographic areas that provide a spatial plan for ecological sustainability. Protected areas, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) together form a network of natural and semi-natural areas that enable **healthy living landscapes in the long term**. These natural areas can co-exist in a **matrix of multiple land uses**, including urban development, agriculture, plantation forestry, mining and others.

CBA Maps should be used by planners and decision-makers in a range of sectors to inform **choices about which land uses are appropriate** in which places. For example, they can help to guide municipalities in developing land-use plans, and they provide crucial information to government departments and agencies that issue authorisations for development. By using CBA Maps, we can **streamline the decision-making process** to better conserve South Africa's biodiversity heritage, safeguard natural ecological processes and ensure that people continue to receive benefits from nature.

What is a CBA Map?

A CBA Map is a spatial plan for ecological sustainability. It shows the places that are priorities for conserving species and ecosystems, and for maintaining natural ecological processes. The network of protected areas, Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) is designed to ensure that a viable sample of all ecosystem types and species is conserved and to maximise connectivity of natural areas. This supports landscape-level ecological functioning as well as the ability of ecosystems and species to adapt to climate change.

CBAs must be kept in a natural or near-natural state to support ecological sustainability of the landscape. ESAs do not need to be completely natural, but must be kept at least semi-natural so that they retain their ecological functioning.

What is biodiversity?

All life on Earth, from the genes in the cells of each individual plant or animal, to the species themselves and the ecosystems in which they live, make up a variety of life that is called biodiversity. South Africa is a megadiverse country with a wealth of biodiversity assets. We show biodiversity spatially as mapped features representing species, ecosystem types or ecological processes.

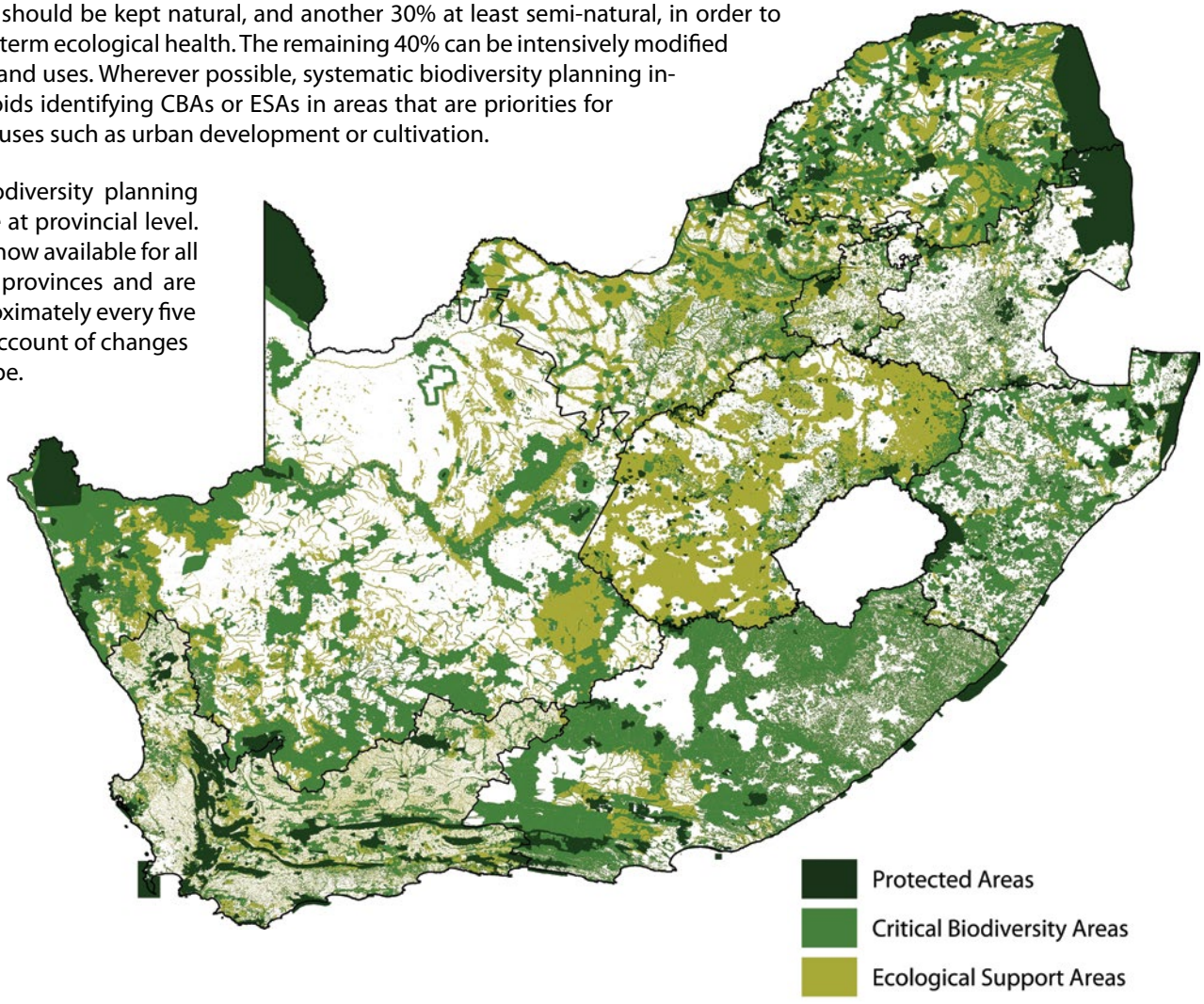
Biodiversity is the basis for a whole suite of benefits that people get from nature, from clean water, to productive soils, protection from natural disasters, and recreational spaces.

How are CBA Maps developed?

CBA Maps are developed using a scientific method known as systematic biodiversity planning. The amount of natural habitat that should be retained as CBAs or ESAs is determined through quantitative thresholds that are based on the characteristics of the species, ecosystems and ecological processes in the landscape for which the CBA Map is being developed. These quantitative thresholds are known as biodiversity targets and they help to ensure that CBA Maps have a basis in sound science.

Sometimes, more than one biodiversity target can be met in the same place, so by identifying CBAs or ESAs that meet multiple targets, the method is spatially efficient. In other words, the CBA Map shows the best arrangement of places to reach the biodiversity targets in the smallest possible area. Generally speaking, about 30% of the landscape should be kept natural, and another 30% at least semi-natural, in order to maintain long-term ecological health. The remaining 40% can be intensively modified by a range of land uses. Wherever possible, systematic biodiversity planning intentionally avoids identifying CBAs or ESAs in areas that are priorities for intensive land uses such as urban development or cultivation.

Systematic biodiversity planning is mostly done at provincial level. CBA Maps are now available for all South Africa's provinces and are updated approximately every five years to take account of changes in the landscape.



CBA Maps show categories with varying degrees of ecological importance

CBA Maps divide the landscape into five main categories: protected areas, CBAs, ESAs, other natural areas and areas where no natural habitat remains. Each category has a different desired state, which in turn determines which land uses are compatible with that category.

CBA Map category	Description	Desired state	Examples of compatible land uses
Protected area	Areas that are formally protected in terms of the Protected Areas Act. Each protected area has a management plan.	As per each protected area's management plan.	• Conservation-related land uses
Critical Biodiversity Area 1 (CBA 1)	Areas that are irreplaceable for meeting biodiversity targets. There are no other options for conserving the ecosystems, species or ecological processes in these areas.	Maintain in natural or near natural ecological condition.	• Open space • Low impact ecotourism or recreation
Critical Biodiversity Area 2 (CBA 2)	Areas that are the best option for meeting biodiversity targets, in the smallest area, while avoiding conflict with other land uses.		
Ecological Support Area 1 (ESA 1)	Areas that support the ecological functioning of protected areas or CBAs, or provide important ecological infrastructure.	Maintain in at least semi-natural ecological condition.	• Low impact ecotourism or recreation • Sustainably managed rangelands • Certain forms of low density housing
Ecological Support Area 2 (ESA 2)		No further intensification of land use.	• Intensive agriculture
Other natural area (ONA)	Natural or semi-natural areas that are not required to meet biodiversity targets or support natural ecological processes.	Best determined through multi-sectoral planning processes.	From a biodiversity perspective, these areas can be used for a range of intensive land uses
No natural remaining (NNR)	Areas in which no natural habitat remains.		

CBA Maps are accompanied by land-use guidelines

Land-use guidelines give details about which land uses and activities are appropriate in each CBA Map category. The land-use guidelines are usually shown in a table that lists all the possible land uses, and then indicates 'yes', 'no' or 'restricted' for each land use in each CBA Map category.

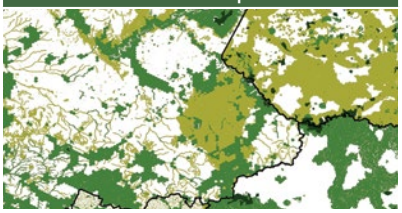
- '**Yes**' means that the land use is compatible with the CBA Map category. It is recommended that this type of land use can go ahead in areas that fall within this category. For example, extensive game farming is usually appropriate in ESAs.
- '**No**' means that the land use is incompatible with the CBA category. It is recommended that this type of land use be avoided in areas that fall within this category. For example, mining and urban development are not appropriate in CBAs.
- '**Restricted**' means that the land use may be appropriate in some circumstances. For example, low density rural housing or grazing may sometimes be appropriate in CBAs and ESAs, depending partly on the types of ecosystems that are present. The restrictions are usually explained in the land-use guidelines. Ecosystem guidelines for environmental assessment are a useful accompanying guide to better understand the restrictions. Ecosystem guidelines are available for fynbos, grasslands and freshwater ecosystems.

How should a CBA Map be used?

CBA Maps are the biodiversity sector's input into decisions on appropriate land uses. There are two main ways that CBA Maps should be used:

1. To inform spatial planning that shows the desired future uses of the land (such as Spatial Development Frameworks).
2. In decision-making in response to development applications (such as environmental authorisations).

CBA Map



Land-use guidelines

	CBA	ESA
Land use A	No	No
Land use B	No	Yes
Land use C	Restricted	Yes

Municipal and provincial spatial planning	Development applications and decision-making
Aim:	
To *encourage appropriate land uses* that are compatible with the desired state of CBAs and ESAs.	To *avoid inappropriate land uses* that will compromise the desired state of CBAs and ESAs.
Legal framework:	
CBA Maps and their associated guidelines can be published as bioregional plans in terms of the National Environmental Management: Biodiversity Act. In terms of this Act, an approved bioregional plan may not be in conflict with a Spatial Development Framework and vice versa.	CBAs trigger Environmental Impact Assessments in terms of Listing Notice 3 of EIA regulations under the National Environmental Management Act.
CBA Maps should be used by:	
Urban or regional planners.	Environmental assessment practitioners and officials in relevant provincial and national departments.
CBA Maps should inform:	
• Spatial Development Frameworks • Land-use Schemes • Strategic Environmental Assessments • Environmental Management Frameworks	• Environmental Impact Assessments and environmental authorisations • Land development applications • Mining, water and agricultural authorisations • Biodiversity offsets
How CBA categories should be used:	
CBAs should be assigned to land-use categories or zones that will keep the area in a natural state. For example, environmental conservation, low impact tourism. **ESAs** should be assigned to land-use categories or zones that will keep the area in a semi-natural state. For example, extensive agriculture.	Developments that will modify an area from a natural state should not be authorised in CBAs. Examples include mining and urban development. Developments that will prevent natural ecological processes from occurring should not be authorised in CBAs or ESAs. An example is linear infrastructure that disrupts ecological corridors.

For more information:

- SANBI. 2013. Ecological infrastructure: Nature delivering services. SANBI Factsheet Series. South African National Biodiversity Institute, Pretoria.
- SANBI. 2017. Technical guidelines for CBA Maps: Guidelines for developing a map of Critical Biodiversity Areas & Ecological Support Areas using systematic biodiversity planning. First Edition (Beta Version), June 2017. Compiled by Driver, A., Holness, S. & Daniels, F. South African National Biodiversity Institute, Pretoria.
- SANBI. 2013. Grasslands Ecosystem Guidelines: landscape interpretation for planners and managers. Compiled by Cadman M, de Villiers C, Lechmere-Oertel R, McCulloch D. South African National Biodiversity Institute, Pretoria.
- Cadman M (ed.). 2016. Ecosystem Guidelines for Environmental Assessment in the Western Cape. Edition 2. Fynbos Forum, Cape Town.
- Driver A, Nel JL, Snaddon K, Murray K, Roux DJ, Hill L, Swartz ER, Manuel J, Funke N. 2011. Implementation Manual for Freshwater Ecosystem Priority Areas. WRC Report No. 1801/1/11, Water Research Commission, Pretoria.

Citations:

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