

CBA series
#3

A Step by Step Guide

Integrating Biodiversity into Land Use Planning



Useful Notes:

What is biodiversity?

Biodiversity refers to the wide variety of plant and animal species in their natural environment. It not only refers to species (plants, animals and micro-organisms), but also to ecosystems, landscapes, and the ecological and evolutionary processes that allow biodiversity to persist over time. It includes the diversity within species, between species, and of ecosystems.

Why is biodiversity important in planning?

Biodiversity is constantly changing & threatened by changing land uses that try to accommodate increasing population, expanding industries and agriculture and climate change. **By providing information of where our ecosystem goods and services are located and by understanding the pressures and threats to ecosystems, policy makers, decision makers and practitioners from a range of sectors can be more informed in policy drafting and implementation of development projects that are cognisant of critical biodiversity areas.**

What is a critical biodiversity area?

These are terrestrial (land) and aquatic (water) features (e.g. vleis, rivers and estuaries) in the landscape that are critical for conserving biodiversity and maintaining ecosystem functioning in the long term (which is particularly important in the face of climate change).

What is a critical biodiversity areas map?

A fine-scale systematic biodiversity plan that delineates on a map Critical Biodiversity Areas and Ecological Support Areas which require safeguarding to ensure the continued existence of biodiversity, its ecological processes (e.g. animal migration, pollination) and its ecosystem services e.g. water supply. The map also delineates formal Protected Areas, Other Natural Areas and No Natural Remaining. The broad objective of the **CBA Map** is to ensure appropriate land use planning for sustainable development, to reduce cumulative impacts on biodiversity and to promote integrated management of natural resources. The CBA map is developed together with **land management and land use guidelines** that are applicable to the different **CBA categories**.

Integrating biodiversity into environmental impact assessments & landuse change applications

This brochure provides guidance for evaluating environmental impact assessments (EIAs), basic assessments, agricultural land use permits, water use licensing decisions and development control decisions through land use legislation (e.g. rezoning and subdivision approvals).

A step by step guide

The following steps should be taken while consulting the Biodiversity Sector Plan / CBA Map in reactive decision making processes.

1

Assess the Biodiversity Sector Plan / CBA Map Information

- Consult the following GIS data to determine the CBA Map category, biodiversity features and land cover on the property:
- Consult the CBA Map GIS shapefile to determine the category of the property (CBA, ESA, ONA and/or No Natural Remaining).
- Consult the associated GIS shapefiles to determine the presence of specific biodiversity features on the property e.g. wetland, river, vegetation type.
- Consult the 'Land Cover' GIS shapefile to determine the land cover category of the property (natural, degraded, irreversibly modified etc.).



2

Assess Other Available Information

- Consult other available information to assist with interpreting the biodiversity of the property and surrounding area. This is especially important since the Biodiversity Sector Plan CBA Map was not done at a fine-scale / accurate scale. For example:
- Consult the Land use Decision Support Tool on the SANBI BGIS website at <http://bgis.sanbi.org> to determine property specific details, and aerial imagery via Google Earth, if necessary.
- Consult the SANBI website for additional biodiversity information resources at <http://www.sanbi.org/information>.
- Consult up-to-date orthophotos, aerial or satellite imagery and Google Earth imagery to assess the presence of natural vegetation on site and/or the level of modification or degradation.
- The National and provincial Protected Area Expansion Strategies can be consulted to identify focus areas for expansion of the protected area network (downloadable from the SANBI BGIS website).
- The Provincial SDF can be consulted for land use policy recommendations.
- Other strategic guidelines can be consulted e.g. Guidelines for Game Farming (developed by the Department of Local Government and Human Settlements), Grazing and Burning Guidelines (SANBI, 2014); NFEPA Implementation Manual for Freshwater Ecosystem Priority Areas (Driver et al., 2011), Guidelines for Development within Kruger to Canyons Biosphere Region (unpublished report), Mining and Biodiversity Guideline (SANBI, 2013); Wetland offsets Guideline (MacFarlane et al., 2014), Buffer zone guidelines for rivers, wetlands and estuaries (Macfarlane and Bredin, 2016) etc.




Site Verification

A biodiversity specialist or ecologist should conduct a site visit to verify that the Biodiversity Sector Plan CBA Map is accurate. This is especially important since the CBA Map was not done at an accurate scale.

The role of the specialist is to confirm or modify the CBA classification of the site based on observed conditions. As a minimum the following should be determined by the specialist, namely:


- Ground-verify that the CBA Map input biodiversity features and criteria (i.e. vegetation types, aquatic habitats, species of conservation concern, etc., see Table 11) and context information (e.g. land cover) are accurately mapped and classified:
Confirm the land cover category of the property (natural, degraded, irreversibly modified) and neighbouring properties.
As a minimum confirm and accurately map all terrestrial and aquatic biodiversity features used in determining the CBA map. Emphasis should also be on ecological processes (e.g. landscape fragmentation and connectivity) therefore it is important that as a minimum the land cover of neighbouring properties should also be confirmed.
Based on the criteria laid out in Table 11 confirm or modify the CBA Map category of the property (CBA, ESA, ONA and/or No Natural Habitat Remaining).
- As a minimum the specialist should produce an ecological sensitivity map for the property that accurately delineates and specifies:
The CBA Map category and associated land management objective.
The land cover category.
Vegetation type(s), ecosystem status and ecosystem protection level.
Other biodiversity features that have not been mapped or have not been accurately mapped (e.g. threatened species, wetlands, natural areas), which should have been classified as a CBA or ESA.
Particularly for extensive sites, indicate the likelihood of presence of species of special concern and/or special habitats.

- Ecological process areas which either delineates the presence of a mapped CBA or ESA corridor, small scale corridors (e.g. along a stream, drainage lines) or process areas (e.g. rivers, wetlands and associated buffers).
 - Recommended buffers for wetlands, rivers and other special habitats or species.
 - Level of disturbance of the vegetation type(s) i.e. pristine (high sensitivity), moderately degraded (moderate sensitivity) or highly degraded (low sensitivity); stating the degree of intactness, including the identification of alien invasive species.
 - Potential for rehabilitation/restoration.
 - The ecological sensitivity map should be provided in shapefile format, with the proposed development area (go area) and the area that will not be developed (no go area) presented in hectares (extent of go and no go area per cadastral unit).
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4

Consult the Guidelines for Land Use Planning & Decision-Making

Once the CBA Map category of the property has been verified (Step 3), consult the land management objective (**Error! Reference source not found.** in Biodiversity Handbooks), recommended biodiversity-compatible land uses (**Table 14** in the Biodiversity Handbooks) and land management guidelines (**Table 15** in Biodiversity Handbooks) in Section 4 of Biodiversity Handbooks.



Follow the terms of reference for environmental assessments (recommended by the Botanical Society of South Africa - Conservation Unit)

The terms of reference recommended by the Botanical Society of South Africa (Conservation Unit) should then be followed as part of the environmental assessment process (basic assessment or full EIA):

1. Provide a general overview of the affected area in terms of connectivity, corridors, and ecological viability of the affected area:
 - 1.1. In terms of biodiversity pattern, identify or describe:
 - a] Community and ecosystem level.
 - b] The main vegetation type¹, the aerial extent and interaction with neighbouring types, soils or topography.
 - c] The types of plant communities that occur in the vicinity of the site.
 - d] Threatened ecosystems².
 - e] The types of animal communities (fish, invertebrates, birds, mammals, reptiles etc.).
 - 1.2. In terms of species level:
 - a] Threatened species³ (give location if possible using GPS).
 - b] The viability and estimated population size of the Threatened species that are present (include the degree of confidence in prediction based on availability of information and specialist knowledge, i.e. High=70-100% confident; Medium 40-70% confident; Low 0-40% confident).
 - c] The likelihood of other Threatened species, or species of special concern, occurring in the vicinity (include degree of confidence).

¹ Mucina L, Rutherford MC & Powrie LW (eds) (2005) *Vegetation Map of South Africa, Lesotho and Swaziland, 1:1 000 000 scale sheet maps*. South African National Biodiversity Institute, Pretoria. <http://bgis.sanbi.org/>.

² National Spatial Biodiversity Assessment <http://bgis.sanbi.org/>.

³ Raimondo et al., (2010) *Red List of South African Plants*. www.sanbi.org

1.3. Other biodiversity pattern issues:

- a] Any significant landscape features or rare or important vegetation/faunal associations such as wetlands, alluvium, seeps, quartz patches, dolomitic eyes, tufas or salt marshes in the vicinity.
- b] The extent of alien plant cover of the site, and whether the infestation is the result of prior soil disturbance such as ploughing or quarrying (alien cover resulting from disturbance is generally more difficult to restore than infestation of undisturbed sites).
- c] The condition of the site in terms of current or previous land uses.

1.4. In terms of biodiversity (ecological) processes, identify or describe:

- a] The key ecological “drivers” of ecosystems on the site and in the vicinity, such as fire.
- b] Any spatial component of an ecological process that may occur at the site or in its vicinity (i.e. corridors such as watercourses, upland-lowland gradients, migration routes, coastal linkages or inland-trending dunes, and vegetation boundaries such as edaphic interfaces, upland-lowland interfaces or biome boundaries).
- c] Any possible changes in key ecological processes, e.g. increased fire frequency or drainage/artificial recharge of aquatic systems.
- d] The condition and functioning of rivers and wetlands (if present) in terms of: possible changes to the channel flow regime (surface and groundwater) and naturally-occurring riparian vegetation.
- e] Would the conservation of the site lead to greater viability of the adjacent ecosystem by securing any of the functional factors listed in (1.4a)?
- f] Would the site or neighbouring properties potentially contribute to meeting regional biodiversity targets for both biodiversity pattern and ecological processes?

- g] Is this a potential candidate site for conservation stewardship? Contact LEDET for information on the stewardship programme.
 - h] What is the significance of the potential impact of the proposed project, alternatives and related activities -- with and without mitigation -- on biodiversity pattern and ecological processes (including spatial components of ecological processes) at the site, landscape and regional scales?
2. Indicate on a topographical map, orthomap or on aerial imagery, preferably at a scale of 1:10 000 (and less):
 - a] The area that would be impacted on by the proposed development.
 - b] The location of vegetation, habitat and spatial components of ecological processes that should not be developed or otherwise modified.
 - c] Areas, including the site and surrounds that must remain intact as corridors or ecological “stepping stones”.
 3. Recommend actions that should be taken to prevent or, if prevention is not feasible, to mitigate impacts and restore disturbed vegetation or ecological processes. Indicate how preventative and remedial actions will be scheduled to ensure long-term protection, management and restoration of affected ecosystems and biodiversity.
 4. Indicate limitations and assumptions, particularly in relation to seasonality.
 5. Indicate how biodiversity considerations have been used to inform socio-economic aspects of the proposed project, e.g. through changes to the location or layout of infrastructure, or retaining public access to biodiversity-related resources such as grazing.



“ All mapped information should be provided in shapefile (GIS) format, with the proposed development area (go area) and the area that will not be developed (no go area) presented in hectares (extent of go and no-go area per cadastral unit).

This data should be integrated into a GIS land use management database to monitor changes in the CBA Map and the loss of biodiversity. ”

Frequently asked questions when using the CBA Map

1. What if the CBA Map or associated maps (e.g. land cover map/shapefile) indicate that the property is located within a CBA or ESA but the site visit reveals that the property is degraded or that no natural habitat occurs on the site (i.e. it is modified / cleared)?

There are a number of possible explanations for this:

- 1a] If there is a match between site conditions and the land cover map/shapefile, then the CBA Map is correct.

Example A: The site is categorised as a CBA, the land cover category is degraded and the physical site assessment reveals that the property is degraded.

- Some degraded sites are deliberately classified as CBA. In these cases the land cover map will show the site as degraded. The systematic planning process ‘chooses’ pristine (natural) vegetation over degraded vegetation unless there are no more options or no more pristine sites left, i.e. when irreplaceable features are present on a degraded site, the national biodiversity target cannot be met elsewhere (therefore the degraded site becomes critical for meeting targets) or where an area is required for ecological processes e.g. landscape corridors. In such a case, the management guideline is to rehabilitate if possible, and to discourage land use activities that have any further impact on biodiversity.

Example B: The site is categorised as an ESA, the land cover category is degraded (or modified) and the site assessment reveals that the property is degraded (or modified).

- Degraded (e.g. invaded by alien invasive plants) and modified areas (e.g. agricultural land in floodplains, riparian areas and wetland areas) are categorised as ESA. The land cover map will show the site as degraded or modified. This is because they are currently or

potentially still important for supporting ecological processes (e.g. wetland buffer areas, riparian areas and floodplains, linkages important for pollination and animal movement). In such instances, the management guideline is to rehabilitate if possible, and to discourage further hardening of the land in modified areas.

1b] If there is a mismatch between site conditions and the land cover map/shapefile, then the CBA Map is in question.

- The site may have been incorrectly classified as CBA/ESA due to an error in the land cover map, or alternatively a disturbance to the site has occurred subsequent to the development of the CBA Map. In these cases the site visit will show that the land cover on site is different to that indicated in the land cover map. The site must then be assessed for its potential to be rehabilitated and/or its role as part of a landscape corridor. Further, the proposed activity at the site should be investigated in terms of its potential impact on adjacent correctly classified CBA and ESA.

The bottom line is that a suitably qualified specialist is needed to interpret the site in relation to the CBA Map and associated data and criteria (e.g. land cover, vegetation type, ecosystem status etc.). Confirmation through a site visit (i.e. ground- truthing) is essential in all cases because a site that is degraded may still be of biodiversity significance.

2. What if natural habitat is found on a site but this is not indicated on the land cover map/shapefile (and therefore not classified as a CBA or ESA)?

Such inaccuracies may result from inconsistencies in scale or classification error. If the map shows that no vegetation remains, but a site visit reveals the presence of natural habitat, refer to the vegetation data (GIS maps) to determine the vegetation type and its ecosystem status. The site must then be assessed for the presence of features that would make it important for biodiversity conservation (e.g. wetlands, special habitats or species of special concern), which would classify it as a CBA. By identifying these biodiversity features (i.e. the selection criteria in Table 11), it may be possible to determine the correct CBA Map category. The precautionary

principle^g, and all applicable objectives and recommended policies (Section 4 of Biodiversity handbook) should still be applied during decision-making

3. Do 'Other Natural Areas' still require a biodiversity assessment?

Yes, in Other Natural Areas it is important to check for special biodiversity features, e.g. wetlands or species of special concern (i.e. threatened species). Knowledge of special features or species is incomplete, and therefore it is critical to verify that they do not occur on the site.

4. How does the National Equivalent ecosystem status relate to the CBA Map?

All natural intact patches of Critically Endangered (CR) and Endangered (E) ecosystems or features are CBA, but none occur in the municipality. For Vulnerable (V) or Least Threatened (LT) vegetation types, the most efficient areas (i.e. on the least amount of land possible) that can meet national biodiversity targets have been included in CBA. All remaining areas are categorised as Other Natural Areas.

This is done to ensure that an optimal layout of V and LT vegetation types is conserved, while still meeting national biodiversity targets, and to prevent further fragmentation of these categories over time. Note that none of the SA vegetation types that occur within the municipality are Endangered or Vulnerable (Table 3).

5. How do Biodiversity Offsets relate to the CBA Map?

CBA are ideal biodiversity offset receiving areas. Conservation agencies and/or LEDET could be consulted to identify CBA offset receiving areas. The 'Western Cape Provincial Guideline on Biodiversity Offsets' is available at www.capecapeway.gov.za/deadp. To maintain national biodiversity targets and ensure sustainable development, no pristine CBA (or part thereof) should be lost to development. If this is unavoidable, such a loss should be offset. Development in CBA 1 should be guided by the land use guidelines (Table 14 and 15).

CBA 2 may have alternative sites for the relevant target to be met elsewhere in the landscape. Consequently, if the loss of CBA 2 is unavoidable, the biodiversity offset should be to identify an alternative CBA

2 site prior to the environmental authorisation or should be a condition specified in the environmental authorisation. Construction can therefore not proceed without the identification of an alternative CBA 2 site.

6. How do CBA and ESA affect existing land use rights?

CBA Maps cannot grant or take away existing land use rights. They are intended to inform proposed land use changes.

7. Will all CBA become Protected Areas?

It is not possible for all CBA to be formally conserved in Protected Areas. Nonetheless, all should be afforded some form of protection e.g. formal Protected Areas in terms of NEMPAA, appropriate zoning (in municipal land use schemes) and as other Conservation Areas (stewardship agreements or conservancies). CBA Maps will be used to inform the ideal location of future Protected Areas, priority landscape corridors, stewardship activities and conservancies etc.

8. What does it mean if we lose a CBA?

The CBA Map identified areas for conserving biodiversity pattern and process targets on the least amount of land possible. The conversion of habitat within a CBA means that there will be a permanent loss of an important ecological feature or part (or whole) of a landscape corridor. Furthermore, that more land may be required to meet the same targets.

9. Will the CBA Map ever change?

Land use is dynamic and all maps require updating. It may be updated due to (1) errors in the land cover map, (2) unavoidable loss of CBA and ESA and (3) improved knowledge of biodiversity (e.g. identifying new locations of rare species). The Mopani District Bioregional Plan, once published in terms of the NEMBA, will require updating every five years. The current CBA Map should inform future updates.

10. Which vegetation map was used in the development of the Maruleng Critical Biodiversity Areas Map?

The 'National Vegetation Map of South Africa' (Mucina and Rutherford, 2006). Although some changes were made to Woodbush Granite Grassland and some of the forests (due to available fine-scale data) during the development of the provincial Limpopo Conservation Plan version 2 (Desmet et al., 2013), none of these vegetation types occur in Maruleng.

11. How does the Maruleng Critical Biodiversity Areas Map relate to the Mopani District Bioregional Plan and the provincial CBA Map (Desmet et al., 2013)?

The Maruleng CBA Map forms part of the Mopani District Bioregional Plan (LEDET, 2016), which is based on the provincial map developed in the provincial Limpopo Conservation Plan version 2 (Desmet et al., 2013). Integration of new data in 2015 / 2016 during the development of the Mopani District CBA Map resulted in a refinement of the provincial CBA Map. It thus supersedes the provincial CBA Map.

12. Are fine-scale biodiversity plans replacing broad-scale biodiversity plans (e.g. NSBA, STEP, ECBCP)?

Fine-scale biodiversity plans provide more accurately mapped information for site-specific decisions (but still require verification). The most recent biodiversity plans at the finest scale should take precedence over other biodiversity plans when informing land use planning and decision-making.

13. What land cover map was used?

A new land cover map for the Mopani District Bioregional Plan (LDEDET, 2016a) was developed based on the national land cover data (DEA, 2013-2014). The land cover was done at a 30 m resolution and some land cover was poorly classified. Therefore, spatial and land cover category inaccuracies will be evident at the site level (Figure 12, Section 2.8)

14. What is the scale of the CBA Map?

Approximately 1:50 000.



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The Association for Water and Rural Development

AWARD is a non-profit organisation specialising in participatory, research-based project implementation. Their work addresses issues of sustainability, inequity and poverty by building natural-resource management competence and supporting sustainable livelihoods. One of their current projects, supported by USAID, focuses on the Olifants River and the way in which people living in South Africa and Mozambique depend on the Olifants and its contributing waterways. It aims to improve water security and resource management in support of the healthy ecosystems to sustain livelihoods and resilient economic development in the catchment.

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