

CBA series
#6

Glossary of Biodiversity & Spatial Planning Terms



- **Aquatic features or ecosystems** refer to rivers, wetlands and estuaries or natural water features.
- **Aquifer** Underground water-bearing areas.
- **'Best design'** refers to an identified network of natural sites that meet pattern and process thresholds in all vegetation types in a spatially efficient and ecologically robust way, and aim to avoid conflict with other activities (e.g. economic activity) where it is possible to achieve biodiversity thresholds elsewhere. The 'best design' sites include the largest, most intact, least disturbed, connected and/or adjacent areas required in terms of meeting pattern and process thresholds.
- **Biodiversity** 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.
- **Biodiversity offsets** Conservation activities intended to compensate for the residual, unavoidable harm to biodiversity caused by development projects. It usually involves setting aside land in a similar ecosystem elsewhere, at the cost of the developer. See biodiversity receiving areas below.
- **Biodiversity offset receiving areas** These are areas in the landscape that are selected to compensate for the unavoidable and negative impacts of a proposed development. They are usually of equal or greater biodiversity importance to the area of land impacted on or lost.
- **Biodiversity Pattern** is the term for the way in which the components of biodiversity are spatially arranged, and in this document, refers to specific vegetation types or habitat types, e.g. forest or fynbos, a population of rare and endemic species, or other biodiversity features, e.g. a river, wetland (vlei). The habitat type or feature is home to specific animals, plants, birds, insects and other organisms, for example Blue Duiker in forests.

- **Biodiversity Plan(ning)** A map of information about biodiversity features (species, ecosystems, ecological processes), existing Protected Areas; current patterns of land use; and potential and conflicting patterns of land use. These mapped features can be linked for further analysis using Geographic Information Systems (GIS) to identify areas of highest biodiversity importance and to determine priority areas for action.
- **Biodiversity priority areas** In this handbook, the term biodiversity priority areas refers to formal Protected Areas, Critical Biodiversity Areas and Ecological Support Areas.
- **Biodiversity Sector Plan** A tool that feeds into a range of multi-sectoral planning and assessment processes to inform land use planning and decision-making. As a minimum, it should include a Critical Biodiversity Areas Map, a Biodiversity Sector Plan handbook with land use management guidelines and a municipal biodiversity profile; and all relevant GIS shapefiles. It is often a precursor to a gazetted bioregional plan, but in this instance, it has been developed to accompany and further explain the Mopani District Bioregional Plan, as it relates to the Maruleng Local Municipality. It provides biodiversity data specific to the Maruleng Municipality landscape, along with explanatory information, to assist in the uptake of the Mopani District Bioregional Plan at the local level. See ‘Bioregional Plan’ below.
- **Biodiversity Target** (or threshold) is a target area (hectares) which must be safeguarded in order for the component plants and animals to exist and for ecosystems to continue functioning (e.g. pollination, migration of animals). If the threshold for a feature is exceeded (i.e. the extent of the feature is reduced through human activities), the threat arises that ecosystems will deteriorate/collapse, which will severely impact on the delivery of ecosystem services.

The thresholds drive the ‘amount’ of an ecosystem type (e.g. vegetation type) is selected on the CBA Map. It answers the query: ‘How much do we need to achieve a living landscape’ (e.g. number of hectares). Biodiversity Thresholds are the cornerstone of the systematic biodiversity planning approach and are based on species diversity and richness within each vegetation type.

Legislative control also influences target setting, for example Forests are protected by legislation therefore a target of 100 % is set i.e. all the remaining forests require protection.

- **Bioregion** A land and water territory, the limits of which are not politically bound, but which are defined by the geographical boundaries of human communities and ecological systems. Also a geographical space that contains one whole, or several nested, ecosystems characterised by landforms, vegetative cover, human culture and history as identified by local communities, governments and scientists.
- **Bioregional Plan (published in terms of the NEMBA)** A bioregional plan is based on a systematic fine-scale biodiversity plan (ideally at a scale of 1:10 000; or \leq 1:50 000). It includes a Critical Biodiversity Areas map and land and water use guidelines. The compilation and monitoring of bioregional plans is usually the responsibility of the conservation authority or provincial environmental department or of a municipality, if the capacity exists. Municipalities must be consulted in the publishing process. After its publication, the bioregional plan must be taken into account in all future planning by a municipality. A bioregional plan should be compiled for a municipality or cluster of municipalities. Refer to the 'Guideline regarding the Determination of Bioregions and the Preparation and Publication of Bioregional Plans'.
- **Bioregional planning** refers to land use planning and management that promotes sustainable development by recognising the relationship between, and giving practical effect to, environmental integrity, human-well-being and economic efficiency within a defined geographical space, the boundaries of which are determined in accordance with environmental and social criteria. It is an internationally recognised planning concept aimed at achieving sustainable development.
- **Biodiversity priority areas** In this handbook the term refers to formal Protected Areas, Critical Biodiversity Areas and Ecological Support Areas.
- **Cadastral unit** A single property or erf.

- **Carbon storage** (or carbon sequestration) is the storage of carbon dioxide or other forms of carbon through biological, chemical or physical processes. This reduces the impact of carbon, a greenhouse gas, on climate change. In this handbook carbon storage refers to the storage of carbon in plants (via biological processes).
- **Catchment** A catchment is the area (a geographical region) where water from rain (or snow) becomes concentrated and drains downhill into a river or lake. The term includes all land surface, streams, rivers, and lakes between the source and where the water enters the ocean.
- **Connectivity** “Functional” connectivity refers to the ability of connective corridors to sustain ecosystem processes common to linked patches (it is the opposite of fragmentation).
- **Conservancy** Agreements for co-operation among neighbouring landowners for conservation purposes, and which require no legal long-term commitment from landowners.
- **Conservation** The safeguarding of biodiversity and its processes (often referred to as biodiversity conservation).
- **Conservation areas (in the context of this document)** Land under some form of conservation agreement other than those via the NEMPAA. They are not considered formally protected areas, as they are not gazetted in terms of the NEMPAA and do not allow for long term security of tenure. For example Private Nature Reserves declared in terms of provincial ordinances, Biodiversity Agreements in terms of the Biodiversity Act, and conservancies.
- **Corridor/s** - see ecological process areas
- **Critical Biodiversity Areas (CBA)** 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). They are identified through a systematic biodiversity planning approach (see below).



- **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.
- **Delineate [a wetland]** Determine the boundary of a wetland based on soil, vegetation, and/or hydrological indicators.
- **Degraded** landscapes are areas of indigenous habitat that are infested with alien plants, overgrazed or have been impacted in some other manner. These areas are still able to function ecologically (e.g. animals still make use of these areas); albeit in a deteriorated state. Degraded areas have the potential to be restored or rehabilitated.
- **Demand control** Controlling the use of water to ensure that the volume of water use for domestic, industrial and other uses by society is reduced and controlled. This is implemented through various mechanisms, such as recycling, re-use of water, limiting water use to certain periods etc.
- **Ecological process** Natural operations which occur within ecosystems and maintain them as working systems. Ecosystems work because they are kept “alive” by ecological processes such as pollination, nutrient cycling, natural disturbance (e.g. fire, grazing), migration of species, and soil maintenance. Other examples of processes include plant-herbivore processes, lowland to upland gradients, predator-prey relationships, migration and exchange between inland and coastal systems (often along river corridors), seasonal migration of animals, and hydrological regimes (e.g. rivers, wetlands).
- **Ecological process areas** are important for maintaining **ecological processes** (see above). These can either be large scale corridors stretching across entire mountain ranges or from the mountain range to the sea (i.e. landscape, ecological or regional corridors), or they can be small scale such as the buffer area around an isolated wetland.

- **Ecological Reserve** The ecological reserve refers to that portion of streamflow which must remain in rivers to ensure the sustainable healthy functioning of aquatic ecosystems (i.e. the river and its associated wetlands and estuaries).
- **Ecological Sensitivity Map** is a map indicating the relative ecological sensitivity and vulnerability of a planning domain/ area. A sensitivity analysis is conducted to guide the project design in terms of layouts and to determine the most appropriate development scenario. The sensitivity analysis is based on ecological criteria. The map should delineate (a) vegetation type(s) on site of varying sensitivity i.e. whether it is a CBA or Other Natural Area etc., and the ecosystem status (Refer to Appendix A); (b) disturbance of the vegetation type(s) and levels of disturbance on site i.e. pristine (high sensitivity), moderately degraded (moderate sensitivity) or highly degraded (low sensitivity), including the identification of alien invasive species; (c) potential for rehabilitation/restoration; (d) presence of or likelihood of presence of Species of Special Concern⁸; (e) any special features (if applicable); and (f) ecological process areas which delineate either the presence of a mapped CBA corridor (ecological process area or landscape corridor) or the potential for small-scale corridors on site, e.g. along a stream, drainage lines.
- **Ecological Support Area** A supporting zone (ecological) or area required to prevent degradation of Critical Biodiversity Areas and formal Protected Areas, usually located adjacent to or which link CBA and/or Protected Areas. Some of these areas may already be transformed or degraded, but they still support ecological processes.
- **Ecosystem** A natural system that represents the interactions between plants, animals, insects, micro-organisms and the non-living environment (e.g. soil, air, water). Ecosystems can operate at different scales - from very small (a pond) to whole landscapes (an entire water catchment area). In the CBA Map, different types of vegetation were recognised as ecosystems.

- **Ecosystem services** The benefits that people get from nature, such as a regular supply of clean water, flood control, prevention of erosion, pollination (important to the fruit industry, for example), carbon storage (to counteract global warming), stone and sand for building, and clean air vital for our survival i.e. ‘what nature does for us’.
- **Ecosystem threat status** Describes the condition of an areas biodiversity relative to past, present and future threats, and is an indicator of the level of safeguarding required for the continued existence of the biodiversity which is found in that particular area. Ecosystem status of terrestrial ecosystems is based on the degree of habitat loss that has occurred in each ecosystem, relative to two thresholds: one for maintaining healthy ecosystem functioning, and one for conserving the majority of species associated with the ecosystem. As natural habitat is lost in an ecosystem, its functioning is increasingly compromised, leading eventually to the collapse of the ecosystem and to loss of species associated with that ecosystem. Four Ecosystem status classifications types exist, namely Critically Endangered, Endangered, Vulnerable and Least Threatened.
- **Eco-status** The overall ecological status of an aquatic resource in which it should be managed as determined by the Reserve Determination Methodology (developed by the Department of Water Affairs). For example, Eco-status A requires that a river or wetland be managed in its natural state and is not subject to impacts. It indicates the level of protection a river or wetland should receive.
- **Ecotone** A transitional zone between two or more ecosystems (such as a forest and fynbos) which may display characteristics of both. For example, between forests and fynbos, the ecotone comprises hardy pioneer plants that can recover rapidly after disturbance and can protect the forest from fire and the drying effects of the sun.
- **Endemic** A plant or animal species, or a vegetation type, which is naturally restricted to a particular defined region (not to be confused with indigenous). For example, a plant may be endemic to a certain region, which means it is restricted to this area and does not grow naturally anywhere else in the country or world.



- **Environmental Management Framework (EMF)** An EMF allows environmental constraints and opportunities to be examined at a regional level to influence project-specific decisions before they are made. They identify opportunities and constraints to developments, and also allow for the consideration of cumulative effects that may be expected in the study area. They inform land use decision-making processes once development proposals are submitted.
- **Environmental Management Plan (EMP)** The EMP provides specifications that the landowner shall adhere to, in order to minimise adverse environmental impacts associated with a land use activity e.g. alien plant management on land for conservation. In terms of proposed developments, an EMP can be defined as “an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced”. EMPs are therefore important tools for ensuring that the management actions arising from Environmental Impact Assessment (EIA) processes are clearly defined and implemented through all phases of the project life-cycle.
- **Floodplain** a smooth, relatively flat valley floor next to and formed by a river or stream subject to periodic overflows.
- **Fine-Scale Biodiversity Plans** are more accurate maps of biodiversity prepared at a scale of 1:5 000 - 1:50 000 (or finer) and which identify important areas for conservation and sustainable management. See systematic biodiversity plan below.
- **Fragmentation [of habitat]** The breaking up of a continuous habitat, ecosystem, or land use type into smaller fragments.
- **Function/functioning/functional** Used here to describe natural systems working or operating in a healthy way (opposite to dysfunctional which means working poorly or in an unhealthy way)

- **GIS and GIS shapefiles** A GIS is a computer technology that combines geographic data (the location of man-made and natural features on the earth's surface) and other types of information (names, classifications, addresses and much more) to generate visual maps and reports. A GIS can play a major role in integrating information from a variety of databases to identify problems and explore solutions (Adapted from Looney 2000 *Beyond Maps - GIS and Decision-making in Local Government*).
- **Ground truthing** is the verification of mapped information with real features on the site.
- **Groundwater** is the term for any water found subsurface in the saturated zone below the water table, i.e. the water table marks the upper surface of the groundwater systems.
- **Habitat** The natural home of a plant or animal species. Generally those features of an area inhabited by animal or plant which are essential to its survival. The habitat of a frog might be a wetland.
- **Hotspot** Biodiversity hotspots are areas of high species diversity, which are also under serious threat.
- **Indigenous** Naturally occurring or “native” to a broad area, such as South Africa.
- **Intact/ecological integrity** Used here to describe natural environment that is not badly damaged, and is still operating healthily.
- **Integrated management** in this handbook refers to the management of land use in an integrated fashion. This implies the need to consider the socio-economic and environmental (biodiversity) impact of land use change and development to ensure sustainable development. The principles of accountability, participation, equitability and sustainability are promoted.

- **Invasive alien species** Invasive alien species means any *non-indigenous* plant or animal species whose establishment and spread outside of its natural range threatens or has the potential to threaten natural ecosystems, habitats or other species ecosystems; and may result in economic or environmental harm, or harm to human health.
- **Land cover** The substance which covers the land, e.g. natural vegetation, roads, factory, or bare ground. In the context of this document, land cover gives an indication of the level of transformation of natural ecosystems and can range from natural through to irreversibly transformed. Land cover cannot always be equated to land use, e.g. bare land can either be borrow pits (where the land use is mining) or natural bare soil (where the land use may be conservation). It is one of the crucial components of systematic biodiversity planning (see below).
- **Landscape corridor** - see ecological process area.
- **Land use** is the human alteration of the natural environment into the built environment (e.g. agriculture, mining, plantation, and settlements) or the human preservation of the natural environment (e.g. conservation).
- **Land use planning and decision-making (LUPDM)** Land use planning and decision-making takes the form of both reactive decision-making and proactive planning. The former refers to decisions and recommendations made by authorities and professionals dealing with land use development applications (e.g. EIA and LUPO); whilst the latter refers to the compilation of forward planning documents and maps, such as SDFs, SEAs etc., which guide land use development. LUPDM is a multi-sectoral planning process.
- **Listed Threatened Ecosystems** are ecosystems that are threatened (CR, E and V - see ecosystem status) and have been listed in terms of Section 52 of the National Biodiversity Act (10 of 2004).



- **Mainstreaming biodiversity** means integrating biodiversity considerations and the sustainable use of biological resources into the policies, strategies and day-to-day operations of a range of sectors whose core business is not biodiversity conservation (e.g. into economic sectors and development models and programmes) and in so doing, integrating it into all human behaviour. Mainstreaming biodiversity is essential for overcoming the "conservation versus development" mindset, and for ensuring sustainable development.
- **Multi-sectoral planning procedures** consider all available sector plans (biodiversity, agricultural, mining, economic, social, etc.) in order to make informed decisions and promote sustainable development. IDPs and SDFs are examples of multi-sectoral planning tools.
- **National Equivalent** ecosystem status. See ecosystem status above.
- **National Biodiversity Threshold** See Biodiversity Threshold above.
- **Place-bound versus non-place-bound** Place bound is where a proposed development is dependent on a certain location, e.g. mining only occurs where minerals are located, versus non-place bound development which is not dependent on a certain location e.g. a paint ball centre or water park.
- **Planning Unit** The minimum unit of land used in the biodiversity (conservation) planning process to identify Critical Biodiversity Areas (and the other mapped categories of land).
- **Precautionary principle** In the face of uncertainty about the workings of ecosystems and the effects of human activities, we should always err on the side of caution. Incomplete or inadequate data are generally the norm in conservation and resource management activities; however, the lack of data should not be used to justify a delay in taking conservation actions. Actions or refraining from potentially harmful actions should be based on the probable consequences to species, habitats and ecosystems, especially when long-term, or irreversible, consequences are more likely than not. Referred to in the NEMA.

- **Pristine** Unspoiled, used here to describe the natural environment in its undisturbed state.
- **Protected Areas** These are formally protected areas declared in terms of the National Environmental Management: Protected Areas Act.
- **Ramsar Convention and List:** Known as the ‘Convention on Wetlands of International Importance’, where certain wetlands have been listed and have acquired a new status at the national level and are recognised by the international community as being of significant value, not only for the country, but for humanity as a whole (see www.ramsar.org).
- **Red Data species:** Plant or animal species that have been assessed and classified according to their potential for extinction in the near future. These species are listed in the Red Data Book and classified as Extinct, Critically Endangered, Endangered, Vulnerable, Near Threatened or Least Concern. Red Data species are those species classified as Extinct, Critically Endangered, Endangered or Vulnerable. They are protected by law under provincial ordinances, the NEMA, and the Biodiversity Act.
- **Rehabilitate/rehabilitation - see also restore/restoration** Meaning (roughly) restoration, especially after mining activities or quarrying, but where the natural environment is not repaired to its original pristine state. Rehabilitation emphasizes the reparation of ecosystem processes, productivity and services.
- **Restore/restoration** (Ecological restoration) The process of assisting the recovery of an ecosystem that has been degraded, damaged, or destroyed. It involves the repair of the natural environment to a state close to its original state. For example, this can be achieved through the removal of alien invasive plants, or the repair of eroded sites and the replanting of indigenous plants. Restoration involves, not only the reparation of ecosystem processes, productivity and services, but also the re-establishment of species composition and community structure.
- **Rezoning and Land Use Schemes** The general purpose of zoning is to determine land use rights, manage urban growth, develop and utilise land, as well as conservation of the natural and cultural environment.

- **Shapefile** Several GIS files that together produce a geographical/mapped feature e.g. dam, road, vegetation type, also known as a GIS layer or map (see above).
- **Species** Any living organism e.g. plant, animal, insect, bird, etc., of a particular kind and name.
- **Species of Special Concern (SSC)** in this handbook refers to red data species (see above). SSC are also referred to as Species of Conservation Concern or Taxa of Conservation Concern.
- **Sustainable development** Development that meets the needs of both present and future generations, equitably. In terms of the NEMA, (sustainable) development is the integration of social, economic and environmental factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.”
- **‘Sustainable Human Settlements’** Integrated and sustainable human settlements that redress the legacy of racial and social divisions, combat urban sprawl, ensure centrality for the poor and create empowered communities through social capital formation (PSDF, 2005). Encouraging nodal development and the protection of nature’s ecosystem services, to promote sustainable development.
- **Systematic biodiversity plan (technically known as a systematic conservation plan)** A map which indicates priority areas for conservation and sustainable management to ensure the continued existence of biodiversity. Systematic biodiversity planning is an approach to conservation that prioritises actions by setting quantitative targets (thresholds) for biodiversity features (e.g. vegetation types). It is premised on conserving a representative sample of biodiversity pattern, including species and habitats (the principle of representation), as well as the ecological and evolutionary processes that maintain biodiversity over time (the principle of persistence).

- The configuration of priority areas identified in the plan is designed to be spatially efficient (i.e. to meet biodiversity targets as efficiently as possible in terms of the amount of land required) and where possible to avoid conflict with other land uses where these are known to exist (principles of efficiency and conflict avoidance). It recognizes that the whole landscape must be planned and managed strategically to ensure sustainable development. (It is the technical term for the CBA Map - see Critical Biodiversity Areas Map above).
- **Thresholds** See biodiversity threshold above.
- **Modification / Modified Land [habitat loss]** Clearing an area of its indigenous vegetation. These modified parts of the landscape no longer contain indigenous habitat. In many areas, this has led to the breakdown of natural ecological processes.
- **Urban Edge** An urban edge is ‘a defined line drawn around an urban node as a growth boundary i.e. the outer limit of urban areas’. It is intended to protect the rural environment from urban sprawl and to encourage efficient settlement patterns. Refer to the DEADP Guideline Document ‘Urban Edge Guidelines in the Western Cape’.
- **Vegetation** The collective term for plants in an area. Often referred to as “bush” or “veld”.
- **Water Management Area** South Africa is divided into Water Management Areas (WMAs), according to the National Water Act (36 of 1998). A WMA is an area established as a management unit in the national water resource strategy within which a catchment management agency will conduct the protection, use, development, conservation, management and control of water resources.





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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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About USAID: RESILIM-O

USAID: RESILIM-O focuses on the Olifants River Basin 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 that support livelihoods and resilient economic development in the catchment. The 5-year programme, involving the South African and Mozambican portions of the Olifants catchment, is being implemented by the Association for Water and Rural Development (AWARD) and is funded by USAID Southern Africa.

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