Zimbabwe's Fifth National Report to the Convention on Biodiversity

MINISTRY OF ENVIRONMENT, WATER AND CLIMATE

REPUBLIC OF ZIMBABWE

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Foreword

Zimbabwe is a signatory to the United Nations Convention on Biological Diversity and accordingly has obligations to implement the provisions of the convention. Article 26 of the convention requires Zimbabwe to produce a national report every four years. The national report provides information on measures taken for the implementation of the convention and the effectiveness of these measures.

In this context, Zimbabwe's Fifth National Report to the Convention on Biological Diversity updates the 2010 fourth national report. The national reporting system assists the country in considering lessons learnt, identifying gaps in capacity for policy research and analysis at the national level, including technical and financial requirements, and formulating appropriate actions for the future.

Biodiversity is the cornerstone of the Zimbabwe's economy and the livelihoods of the majority of the its population. To judge from the assessment of the state of biodiversity over the past four years, there is a need to redouble our conservation efforts. Over the past decade, the major direct drivers of ecosystems change and biodiversity loss in Zimbabwe have been accelerated urban housing construction, expansion in agriculture and mining, unsustainable exploitation of natural resources, deforestation, invasive alien species, climate change and high dependence on the natural capital for human development.

Human encroachment has been reported in some protected areas, private game reserves, wetlands and conservancies, and this has resulted in the modification of ecosystems and of habitats. Mitigation efforts have been undertaken to reduce biodiversity loss. Despite these challenges, biodiversity remains the foundation of the natural heritage of Zimbabwe and needs to be conserved through the participation of every sector of the economy, including local communities.

A number of policies are in place for the conservation of biodiversity. However, there is a need to mainstream biodiversity issues into different sectoral policies for sustainable development. This is important because the economic sector impacts on the environment through its consumption of energy, water and materials and the production of emissions that are detrimental to biodiversity. There is also a need for the continuous updating of policies in line with innovation. Furthermore, economic valuation of our biodiversity should be done for decision making.

I thank the United Nations Development Programme and the Global Environment Facility for their financial support, as well as all the stakeholders who supported the preparation of the Fifth National Report.

Honourable O.C. Z. Muchinguri (MP)
MINISTER OF ENVIRONMENT, WATER AND CLIMATE

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Acronyms

ABS	Access and Benefits Sharing
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CBD	Convention on Biological Diversity
CwD	Coping with drought
EMA	Environmental Management Agency
FAO	Food and Agriculture Organisation
GEF	Global Environment Facility
MAB	Man and Biosphere Programme
MAMID	Ministry of Agriculture, Mechanisation and Irrigation Development
MEWC	Ministry of Environment, Water and Climate
NBSAP	National Biodiversity Strategy and Action Plan
REDD	Reducing Emissions and Decreasing Deforestation
TFCAs	Transfrontier Conservation Areas
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
ZimAsset	Zimbabwe Agenda for Sustainable Social and Economic Transformation
ZINWA	Zimbabwe National Water Authority
ZPWMA	Zimbabwe Parks and Wildlife Management Authority
ZTA	Zimbabwe Tourism Authority
ZimStat	Zimbabwe National Statistics Agency

EXECUTIVE SUMMARY

The state of Zimbabwe's biodiversity

Protected area network

Zimbabwe's protected area network is made up of national parks, wildlife estates and gazetted forests, conservancies and Communal Areas Management Programme for Indigenous Resources (CAMPFIRE) areas, which together constitute 28% of the total land area. The network is the major repository of plant and animal biodiversity. Human encroachment on some protected areas, private game reserves and conservancies has resulted in changes to ecosystems and habitats. Zimbabwe has intensified efforts at conserving biodiversity through participation in five transfrontier conservation areas.

Plant diversity

Zimbabwe's plant diversity is a function of ecosystem characteristics that are attributable to the rainfall, geological, soil and temperature condition within ecoregions. WWF defines an ecoregion as a "large unit of land or water containing a geographically distinct assemblage of species, natural communities, and environmental conditions" (wwf.panda.org/about_our_earth/ecoregions). Vegetation community richness has remained stable since 2010 and varies across ecoregions. Central and Zambezi have the richest diversity of plant species, followed by Kalahari, the Eastern Highlands and lastly Save Limpopo.

Animal diversity in protected areas

There has been a general increase in the elephant population in all the key habitats. Although the populations of most other species have remained stable, Sebakwe and north-west Matabeleland have experienced a decline in sable populations. Poaching in wildlife estates during the past four years has resulted in a loss of more than $45 million, affecting mostly elephants. In 2013 Zimbabwe recorded very high levels of poaching in Hwange National Park. Increased human settlement within Save Valley Conservancy has resulted in high levels of poaching for bush meat, reducing earnings from trophy hunting by $1.1 million per year in the last five years.

Forest biodiversity

Zimbabwe's forest biodiversity comprises plantations, protected indigenous forests, woodlands, bush land and wooded grasslands. The last three cover 42.34%, 10.82% and 2.27% of Zimbabwe's total land surface respectively. Gazetted indigenous forests are found mainly in the north-western region. Forest diversity has been declining due to expansion of agriculture, unsustainable exploitation of fuelwood, infrastructural developments, uncontrolled fires, invasive alien species and climate change. Tobacco farming has contributed to 15% of deforestation due to dependence on fuelwood for curing by 90% of tobacco farmers.

Wetlands

In 2009, Zimbabwe had 1,117 wetlands covering 793,348 hectares, amounting to 1.8% of its total surface area. Following its accession to the RAMSAR Convention in 2011, Zimbabwe now has seven wetlands designated as RAMSAR sites – Monavale Vlei, Cleveland Dam, Lake Chivero and Manyame (all in or near Harare), the Chinhoyi Caves, Mana Pools National Park, Victoria Falls National Park and Driefontein Grasslands near Mvuma in the Midlands. Most of Zimbabwe's wetlands (60%) fall within communal and resettlement areas and are prone to high levels of degradation. The major causes of degradation are unsustainable human activities such as overgrazing, cultivation and the impact of climate change. Wetlands in urban areas are threatened by illegal housing construction, infrastructure development and informal agriculture. Excessive use of fertilizer and discharge of industrial waste and untreated sewage have increased pollution of Harare's water supply reservoirs.

Avifaunal biodiversity

Zimbabwe has 20 Important Bird Areas (IBAs) covering 30,050 square kilometres, which is 7.7% of the total surface area. Eleven of these IBAs are in protected areas. The number of endangered species has increased from two in 2010 to four in 2014, while the white-winged flufftail (*Sarothrura ayresi)* is critically endangered and may be on the brink of extinction. Direct threats to bird species include poisoning and snaring. The population of wattled crane decreased from 146 in 2004 to 76 in 2010 due to changes in habitat following the conversion of the grasslands to croplands.

Aquatic biodiversity

Zimbabwe's aquatic ecosystems are threatened by high pollution levels that have provided fertile ground for the spread of aquatic invasive plants such as *Pistia stratiotes* (water lettuce or Nile cabbage), *Eichhornia crassipes* (water hyacinth) and *Salvinia molesta* (Kariba weed). The presence of these invasive species has reduced the productivity and the aesthetic value of ecosystems. Aquatic animal species such as the largemouth bass *(Micropterus salmoides*), the Nile tilapia (*Oreochromis niloticus*) and the red claw crayfish (*Cherax quadricarinatus*) pose a threat to commercial fishing. Trends in catches of kapenta, or Lake Tanganyika sardine (*Limnothrissa miodon*), from 1970 to 2013 in Lake Kariba show a decline due to overfishing.

Agricultural biodiversity

Zimbabwe produces several crop seed varieties. The National Gene Bank of Zimbabwe plays an important role in the safekeeping of germplasm and on-farm conservation projects. The extent of germplasm is greatest for small grains such as sorghum (a total of 1,393 accessions), pearl millet (1,038) and finger millet (762). The smallholder farming sector still holds most of Zimbabwe's livestock. The populations of most livestock species have declined from 2000 to 2012 due to erratic rainfall. Indigenous crop and livestock varieties have become increasingly important as they have proved to be more tolerant to disease and changes in climate. Indigenous cattle breeds include the Mashona, Tuli and Nguni, which are found mainly in the smallholder sector.

Overexploitation of natural resources

Natural resources are overexploited mainly because of poverty as communities and individuals engage in overfishing and deforestation. Deforestation in peri-urban areas has been on the increase since 2011 due to commercialization of firewood in the face of frequent electricity outages. Overharvesting of non-timber products such as wild fruits and medicinal plants is a common practice in most communal lands. An increase in the population of newly resettled areas has resulted in the fragmentation of land and accelerated clearance of forests, woodlands and plantations.

Climate change

Zimbabwe has recently exhibited signs of climate change, such as severe droughts, flooding in low-lying areas and shifts in seasons. Recurrent droughts arising in part from changes in weather patterns have resulted in high mortality and reduced fertility of wildlife and livestock due to reduced nutrition.

Invasive alien species

The most common invasive plant in Zimbabwe is *Lantana camara*, with the highest incidences of occurrence recorded in Mashonaland Central and Midlands. *Opuntia fulgida* is predominant in the Beitbridge and Gwanda districts and affects 2,355 ha and 1,500 households. This cholla cactus has reduced the productivity of rangelands and invaded 3,000 ha in Matabeleland South.

Veld fires

Veld fires affect an average 900, 000 ha of Zimbabwe's land surface annually. In 2010, fires burnt 79,000 ha of indigenous forest. Uncontrolled fires are more common in resettlement areas due to slash-and-burn land clearance for crop cultivation and lack of firebreaks.

Mining

More than a million people are illegally panning for gold along Zimbabwe's rivers, resulting in clearance of trees and digging in river beds, which cause soil erosion, landslides and siltation of water bodies and destroy aquatic biodiversity. Increased use of mercury, iron and cyanide to process ore has polluted water courses, affecting communities' sources of livelihoods. Open-cast mining has resulted in scarring of the landscapes and changes to habitats

Implications for human well-being

The biodiversity sector is important for its economic contribution directly through the export of related products and indirectly by being the bedrock of Zimbabwe's thriving tourism industry. In 2012, it contributed $42 million in export earnings from game products such as skins, hides and trophies. Fishing and crocodile farming are major income earners. Fishing is the main livelihood for communities living in the Zambezi Valley and along the shores of Lake Kariba. Crocodile skins are mostly exported to Europe as salted belly skins, back skins and tails.

Rise in unemployment and poverty

Poverty contributes greatly to biodiversity loss in Zimbabwe's ecosystems. About 76% of rural households are poor compared to 38.2% in urban areas. Poverty in rural areas has led to unsustainable exploitation of natural resources as people there increasingly engage in unsustainable livelihood strategies such as cultivation of marginal areas, alluvial mining and commercialization of forest and non-forest products. In urban areas, there is increased environmental degradation and modification of habitats because of illegal sand abstraction, brick moulding, streambank cultivation, deforestation of peri-urban areas and unplanned settlements on wetlands.

Mainstreaming biodiversity

Although mainstreaming strategies are in place across some sectors, incorporation of biodiversity conservation and management actions in other sectors has been slow. The emerging threat of climate change has, however, given greater impetus for all sectors to adopt coping and mitigation measures that favour biodiversity conservation. Environmental rights have been enshrined in Section 73 of the Constitution of 2013. The Zimbabwe Agenda for Sustainable Economic Transformation (ZimAsset) addresses the need for strategies and measures to tackle environmental challenges, such as pollution, poaching, deforestation, land degradation, veld fires and biodiversity loss. Sectors such as mining, forestry and energy have mainstreamed biodiversity in the activities, policies and plans.

Progress toward the Convention on Biological Diversity Strategic Plan 2011-2020 and the Aichi Biodiversity Targets

Zimbabwe has successfully developed policies and strategies to conserve biodiversity, but implementation of identified actions has been slow due to inadequate financial resources, a lack of technical skills and the need to compromise for accelerated economic development in the case of projects of national strategic importance.

Most of the Aichi Biodiversity Targets have been partly achieved. The limited progress in achieving Target 5 – to reduce the rate of loss of natural habitats, including forests, by at least 50% by 2020 – is due to increased stress on natural resources, unsustainable mining activities, limited livelihood options, lack of environmental awareness, the high dependency of the economy on natural resources and rapid urbanization.

Biodiversity sector actions to achieve the Millennium Development Goals (MDGs)

The biodiversity sector actions and initiatives have generally made a positive contribution toward the achievement of the MDGs. They are, in summary:

Goal 1: Biodiversity conservation in protected areas and CAMPFIRE areas has enhanced livelihoods of communities, and co-management arrangements have improved the standard of living of communities living next to protected areas. The sector is encouraging value addition for natural resources and creating job opportunities in the hospitality, arts and crafts, fisheries and timber industries;

Goal 3: Most natural resource management programmes have encouraged the active participation of women by involving them in decision-making positions on natural resource management committees and community ownership trusts;

Goals 4 and 5: The CAMPFIRE programme has contributed to the establishment of community health service centres;

Goal 6: Traditional medicinal plants continue to supply treatment options for poor and vulnerable households and are critical in the management of communicable diseases;

Goal 7: There has been an increase in protected areas network coverage through proclamation of new RAMSAR sites, expansion of transfrontier conservation areas and the establishment of the Mid-Zambezi biosphere reserve;

Goal 8: There are cleaner production technologies and increased cooperation in renewable energy technologies.

1. INTRODUCTION

Zimbabwe's Fifth National Report to the Conference of Parties to the Convention on Biological Diversity (CBD) is a successor to the fourth report submitted in 2010. The report comes against the backdrop of Zimbabwe's completion of a national population census in 2012 and the adoption of a new constitution in 2013. The census shows that the total population grew by 1.1% to 13,061,239 between 2002 and 2012 (ZimStat 2012).The country has 41% of its population aged below 15 years and 4% are 65 years and older.

Rural-to-urban migration has gained more impetus due to the depressed economic performance of the rural sector. The rural population decreased from around 70% in the late 1990s to the current level of 67%. In addition, the land reform programme has resulted in a degree of rural decongestion as people moved into new areas. However, pressures on biodiversity in most rural areas are still high.

Urban drift has increased the demand for basic services such as housing, water, sanitation, health and energy. Most urban local authorities have failed to deliver these services, resulting in the growth of illegal settlements, poor waste management, deforestation and wetland cultivation in urban and peri-urban areas.

In the past decade the major direct drivers of ecosystem change and biodiversity loss in Zimbabwe have been accelerated urban housing construction, expansion in agriculture and mining, unsustainable exploitation of natural resources, deforestation, invasive alien species, climate change and high dependence on the natural capital for human development.

The socio-economic environment from 2010 to 2013 was marked by high unemployment, poverty and deteriorating social services. According to ZimAsset, capacity utilization in the manufacturing sector declined from 57% in 2011 to 39% in 2013 (GoZ 2013b). Growth in the agricultural sector declined from 7.2% in 2010 to minus 1.3% in 2013, according to the government budget statement of 2014.The decline in manufacturing and agriculture, which have traditionally been the major employers, resulted in a loss of livelihoods for most of the economically active population, and most households have come to depend more directly on natural resources for their livelihoods.

2. BIODIVERSITY STATUS AND TRENDS

Zimbabwe is rich in biodiversity in its varied landscapes and aquatic ecosystems. It has about 5,930 vascular plant species, of which 214 are endemic, 670 bird species, 270 mammal species, 156 reptile species, 120 amphibian species, and 151 fish species. These species are found within and outside protected areas. This report covers the status, trends and threats to the biodiversity of plant, animal and agricultural species in Zimbabwe's major ecosystems.

2.1 Status and trends of plant diversity

Plant diversity varies according to ecosystem characteristics in defined ecoregions. The vegetation composition of these ecoregions (Figure 1) is largely a function of altitude, rainfall and rainfall variability, geology, soil, and temperature patterns. Table 1 shows Zimbabwe's ecoregions, with Central and Zambezi being largest, followed by Save-Limpopo, Kalahari and the Eastern Highlands. The diversity and distribution of plant species across Zimbabwe's ecosystems are shown in Figure 3. The Eastern Highlands has the greatest diversity of plant species, followed by Central, thinning out toward Zambezi and Kalahari and being least in Save-Limpopo.

2.2 Protected area network

National parks, wildlife estates and gazetted forests comprise 14.9% of Zimbabwe's protected area network, conservancies 1.9% and CAMPFIRE areas 11.2%. Wildlife is mainly found in national parks,

Table 1: Zimbabwe's ecoregions

Eco-region	% of total surface area	Corresponding Natural Region	Altitude	Mean annual rainfall	Dominant vegetation type
Kalahari	15	IV and V	1,030 m	560 mm	*Colophospermum mopane, Baikiaea* spp.
Central	38	II and III	1,300 m	620 mm	*Brachystegia spiciformis, Julbernardia globiflora*
Zambezi	26	IV	1,080 m	650 mm	*Colophospermum mopane*
Save-Limpopo	20	IV and V	687 m	400 mm	*Colophospermum mopane, Acacia* spp.
Eastern Highlands	1	I	1,500 m	740 mm	Grassland – *Themeda, Exotheca, Loudetia* Woodland – *Brachystegia spiciformis, Julbernardia globiflora*

Source: Feresu 2010

Figure 1: Zimbabwe's ecoregions

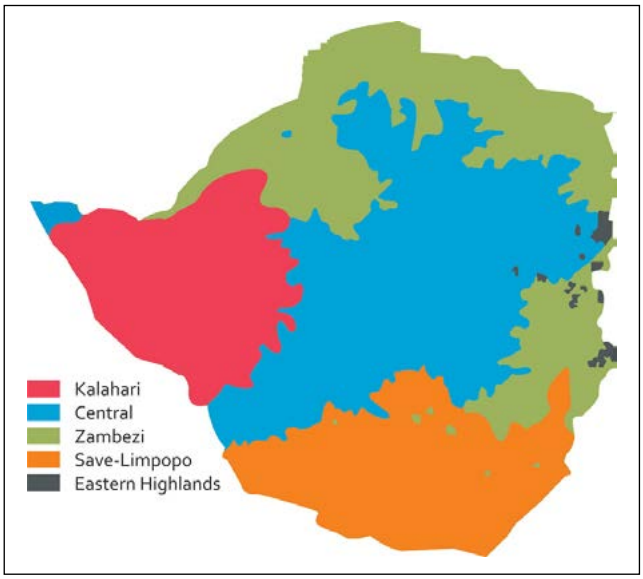
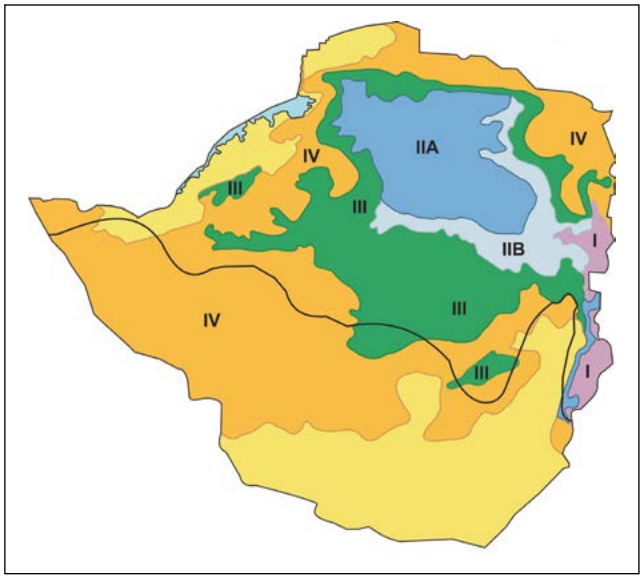
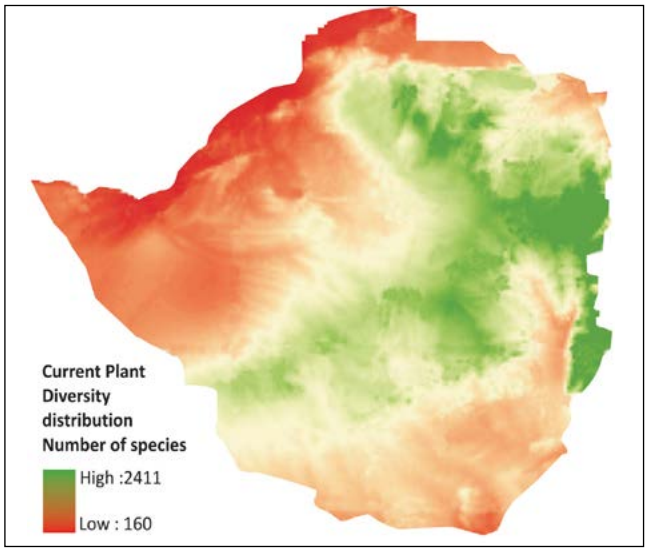


Figure 2: Zimbabwe's natural regions



CAMPFIRE areas and conservancies. Conservancies were under private ownership until the recent changes brought about by a wildlife-based land reform policy. The government introduced the CAMPFIRE programme to maximize the livelihood options for resettled farmers, particularly those

Figure 3: Zimbabwe's plant diversity distribution



Source: Department of Geography and Environmental Science, University of Zimbabwe GIS and Earth Observation Centre

living in areas where crop production has limited potential, by ensuring profitable, equitable and sustainable use of wildlife and other resources. The CAMPFIRE projects involve communities in the co-management of wildlife in communal areas. There has been human encroachment on some protected areas, private game reserves and conservancies (Lindsey *et al* 2011; Williams 2011). Zimbabwe has five UNESCO World Heritage sites – Matobo Hills, Mana Pools, Great Zimbabwe, Khami and Victoria Falls. Designation of part of the Middle Zambezi as a biosphere reserve (see below) has intensified natural resource conservation in the Zambezi Valley.

2.2.1 Transfrontier conservation areas

Transfrontier conservation areas (TFCAs) bring together established wildlife areas in the subcontinent in order to manage them as integrated units across international boundaries. Zimbabwe formally became party to the Kavango-Zambezi TFCA in 2011and is a member of five other TFCAs – Great Limpopo, Chimanimani, Lower Zambezi-Mana Pools, Greater Mapungubwe and ZIMOZA. The TFCAs

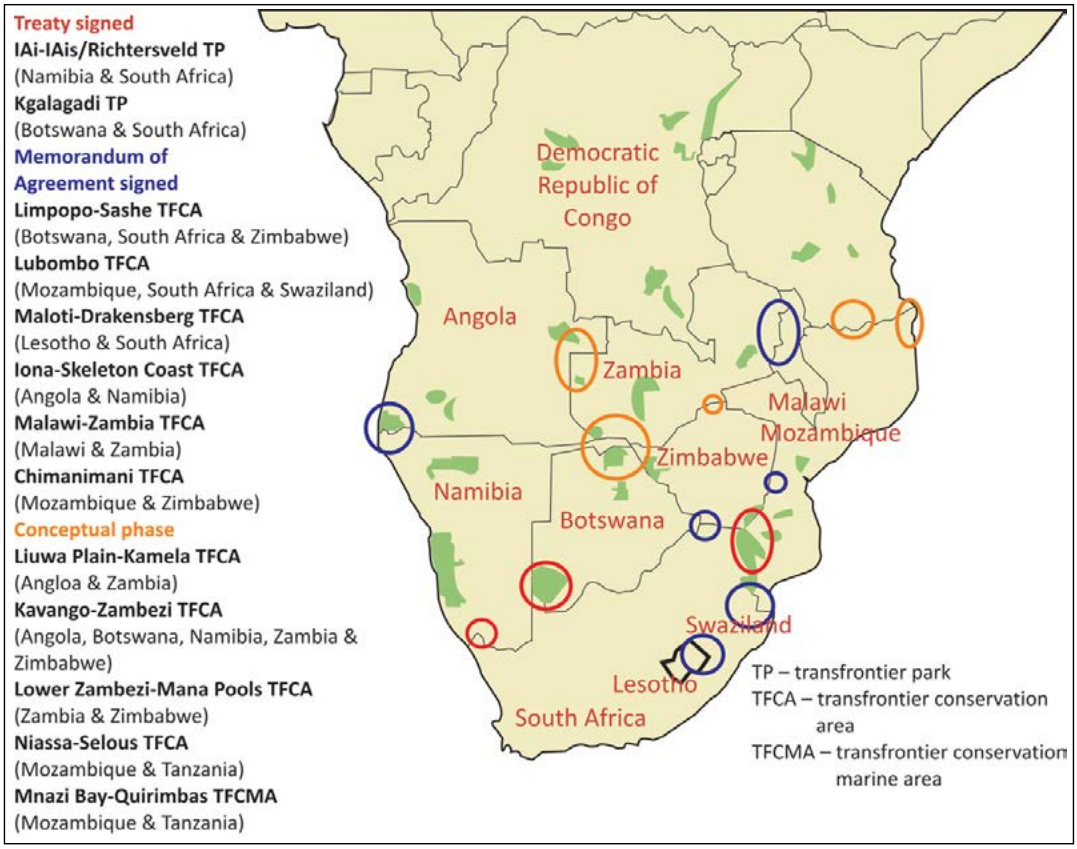
The Middle-Zambezi biosphere reserve

The reserve was inscribed on the World Network of Biosphere Reserves by the international coordinating council for the UNESCO Man and the Biosphere Programme during its 22nd session in Paris on 2 June 2010. Covering about 40,000 km^2 in the Zambezi Valley, the site features riverine and terrestrial ecosystems unique to the subcontinent, including part of Lake Kariba, the world's largest man-made lake.

Mana Pools National Park, part of the core area, is a UNESCO World Heritage Site. Controlled safari sport hunting in parts of the buffer zone provides employment for hundreds of people, while the lake caters for an important fishery industry. The area also comprises human settlements, notably the town of Kariba, which depends largely on fishing in Lake Kariba for protein and income.

The total human population is approximately 40,000. Harvesting of the pelagic fish, *Limnothrissa miodon* (kapenta or Lake Tanganyika sardine), with an annual output of about 30,000 tonnes estimated at a value of $40 million, rivals major lake fisheries in the region. — **Extract provided by the MAB national committee**

Figure 4: Transfrontier conservation areas in the SADC region



promote cross-border cooperation in conservation of biodiversity. Figure 4 shows the TFCAs in the Southern African Development Community (SADC) region.

2.2.2 Status and trends of animal diversity in protected areas

Trends in the population of major mammal species in key habitats between 2000 and 2013 are shown in Figure 5. In all areas, there was a general increase in the population of elephants during the past 13 years. Large mammals and antelope species were stable in all areas except Sebakwe and north-west Matabeleland where the population of sable decreased significantly. The high population numbers were maintained in most protected areas despite the threats posed by poaching in some of the areas (Chamaillé-Jammes *et al* 2009; Dunham 2012; Gandiwa *et al* 2013a; Groom *et al* 2013).

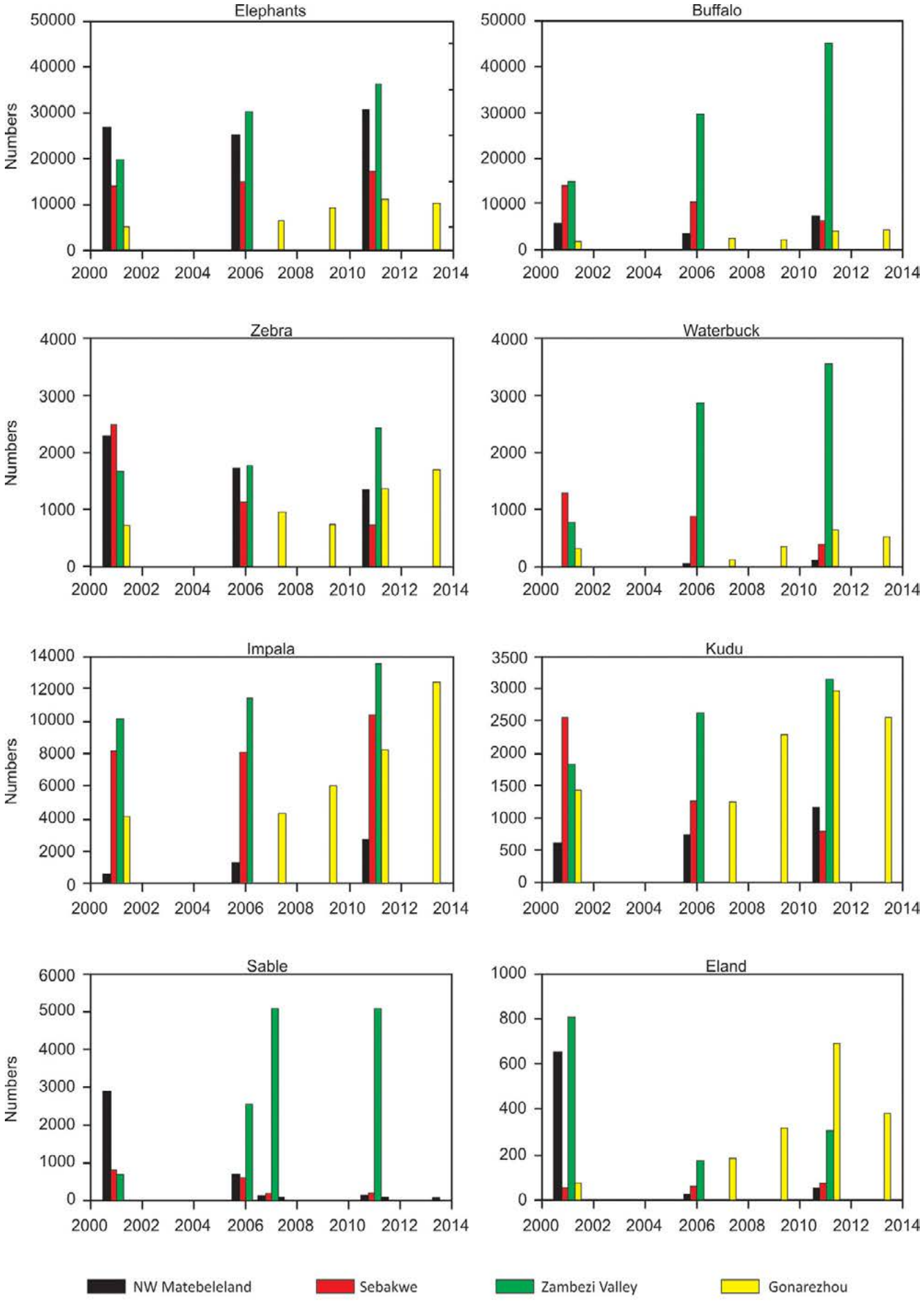
Poaching of wildlife in Zimbabwe's park estates during the past four years has resulted in loss of revenue of about $45.5 million, of which 69% was through loss of elephants. The main reasons for poaching are poverty, food insecurity, dissatisfaction over the distribution of revenue in some CAMPFIRE areas and poor staffing

Table 2 : Levels of animal poaching reported in ZPWMA annual reports

Species	2009	2010	2011	2012	Total loss	Unit value	Cumulative loss over four years
Elephant	145	77	223	*212*	657	$50,000	$32,850,000
Buffalo	91	88	68	*46*	293	$9,000	$2,637,000
Impala	73	-		106	179	$1,000	$179,000
Kudu	56	63	58	74	251	$2,500	$627,500
Zebra	42	20	48	36	146	$3,000	$438,000
Rhino	27	22	33	8	90	$120,000	$10,800,000
LOSS	**$11,648,000**	**$7,499,500**	**$16,011,000**	**$12,373,000**	-	-	**$47,531,500**

Source: ZPWMA ($ values based on Statutory Instrument 56 Schedule of Species)

Figure 5: Trends in selected mammal species in some protected areas of Zimbabwe



by the Zimbabwe Parks and Wildlife Management Authority (ZPWMA), lack of training and inadequate resourcing of the patrol staff. Cumulative losses in financial value over the four years were highest for elephants and rhino (Table 2).

Over the past four years (2011 to 2014), poaching has assumed sophisticated levels, with organized syndicates using chemicals to kill wildlife. This is fuelled by demand by illegal markets for ivory and rhino horns. In 2013, cyanide poisoning in Hwange National Park resulted in the loss of more than 100 elephants as well as scavenging animals and birds that consumed the carcasses. Poaching for bush meat in the Save Valley Conservancy has reduced earnings from trophy hunting by $1.1 million per year in the last five years (Lindsey *et al* 2013).

2.3. Forestry biodiversity

Forests and woodlands, which constitute 42% of the Zimbabwe's land area, are found in communal lands, on private land and in national parks and protected forest areas. The communal and resettlement areas have 67% of Zimbabwe's forest and woodlands, covering about 10 million ha mainly on mountain slopes and river banks, while protected areas constitute 33% (Figure 6), a proportion of which lies within gazetted forests (Figure 7).

The dominant natural forest and woodland ecosystems in Zimbabwe can be classified into *Flora Zambesiaca* and Afromontane phytoregion. *Flora Zambesiaca* is rich in plant diversity with over 8,500 species, of which over 4,600 are endemic (White 1983). The main woodland types in this ecosystem are miombo, mopane, Zambezi teak and *Acacia combretum*. The dry miombo woodlands are the dominant element of *Flora Zambesiaca* in Zimbabwe and the key species are *Julbernardia* and *Brachystegia*. The mopane woodlands, dominated by *Colophospermum mopane*, are found in the highveld, middleveld and lowveld. The Afromontane phytoregion is in the Eastern Highlands and is characterized by moist forest with over 740 vascular plants. Key Afromontane species are *Syzygium* spp., *Widdringtonia nodiflora, Albizia* spp., *Trichilia dregeana, Lovoa swynnertonii* and *Khaya anthotheca.* Table 3 shows coverage and uses of the terrestrial landscape in Zimbabwe. Woodlands and wooded grasslands cover most of Zimbabwe's land surface.

Table 3: Areas under various land uses in Zimbabwe

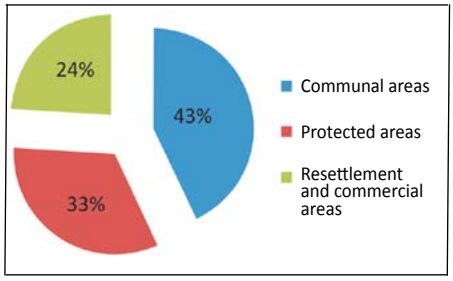
Forest cover type	Hectares	Total
Moist montane forests	11,508	0.03
Plantations	168,581	0.43
Woodlands	16,542,210	42.34
Bush land	4,228,547	10.82
Wooded grassland	888,463	2.27
Grasslands	479,883	1.23
Cultivated land	16,113,866	41.24
Settlements (including cities)	180,904	0.46
Other (rock outcrops & water bodies)	462,051	1.18
TOTAL	**39,076,013**	**100**

Source: Forestry Commission Mapping and Inventory Unit 2008

2.3.1 Threats to forest biodiversity

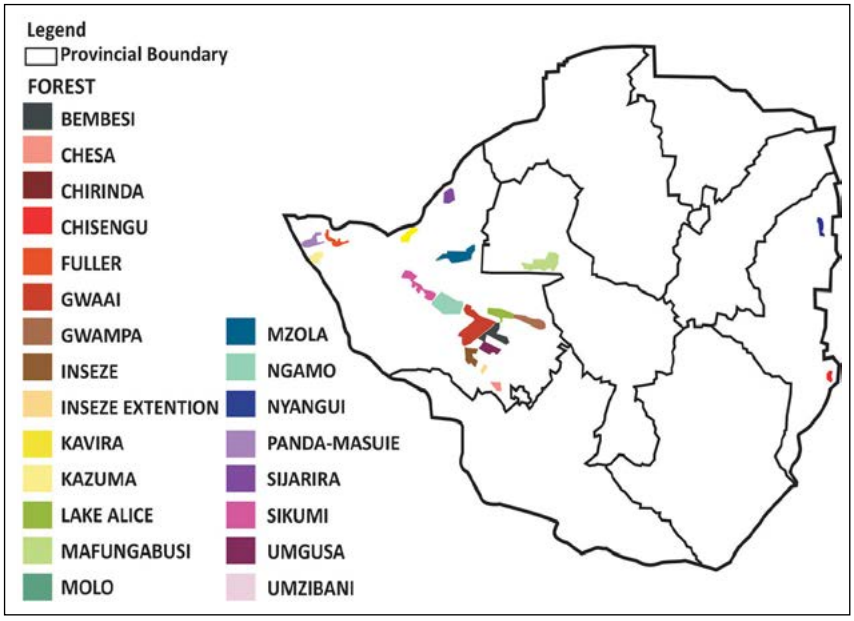
The major causes of forest biodiversity loss are agricultural expansion, use of trees as an energy

Figure 6: Distribution of forests and woodlands in different land tenure categories in Zimbabwe



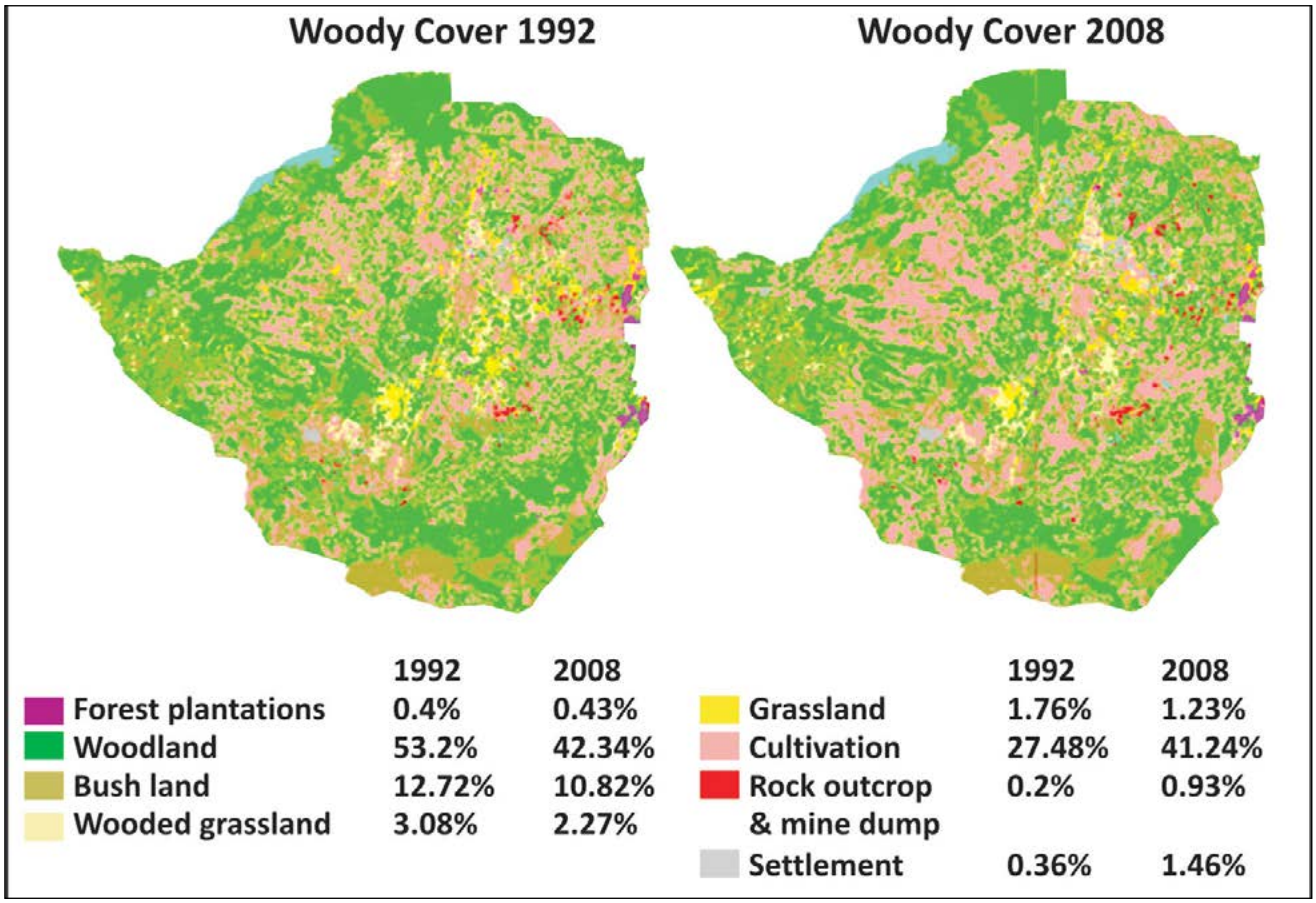
Source: Forestry Commission

Figure 7: Zimbabwe's gazetted forests



Source: Forestry Commission

Figure 8: Land cover changes between 1992 and 2008



Source: Forestry Commission

source, infrastructural development, fire damage and habitat loss to fires, invasive alien species and climate change. Figure 8 shows the land cover map for the area covered by forest, which has been falling significantly (Forestry Commission 2010). The area under cultivation increased by 14% between 1992 and 2008, which supports the observation that close to 70,000 ha is converted to agriculture annually (FAO 2002).

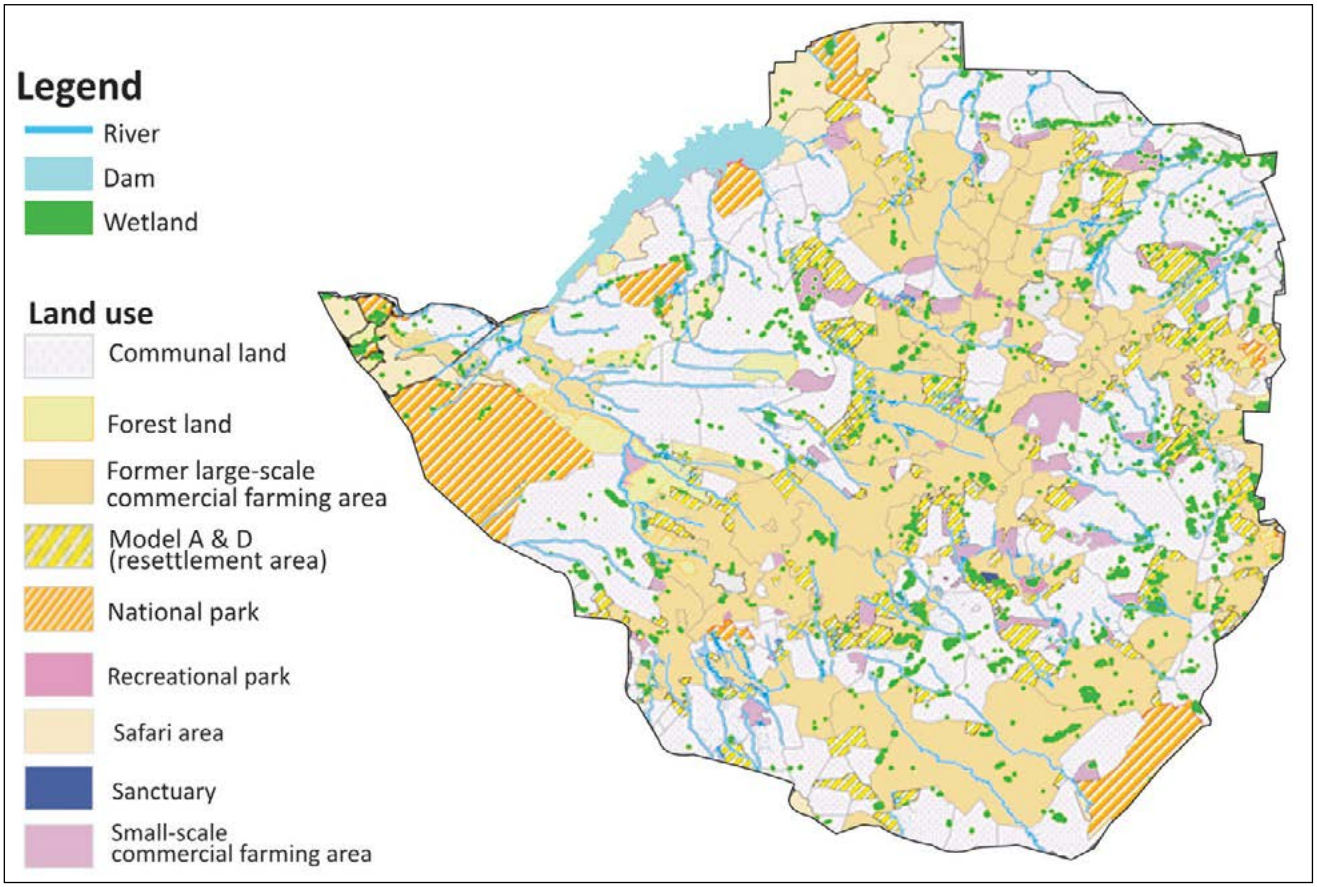
The Forestry Commission estimates that almost 90% of tobacco farmers depend on fuelwood for curing, causing an estimated 15% of the deforestation in Zimbabwe. Nationally an estimated 6 million tonnes or more of fuelwood are consumed annually, while the sustainable output of natural forests is 4.6 million tonnes. This means the country is losing 330,000 ha of forest area – over 60 million trees – a year, yet the current planting rate is only 10 million trees. There is therefore a clear need for the government to establish an institutional and funding framework for developing and implementing strategies to deal with the fuelwood crisis (MEPD 2012). The Forestry Commission has stepped up reforestation countrywide through schools and community nursery projects and various partnership arrangements with NGOs and the private sector, but this remains inadequate.

2.4 Wetlands

Zimbabwe has a wide diversity of wetlands, including dambos and vleis, marshes, pans and floodplains. These wetlands provide diverse habitats for aquatic animals, birds, fish, invertebrates and micro-organisms. They offer important environmental services such as flood control, reservoirs for water during drought, water purification (by sediment extraction) and replenishment of ground water. Wetlands have enabled communities to cultivate food crops and vegetables during the dry season, thereby improving household food security. They also provide opportunities for recreational activities, such as hiking, boating, hunting, fishing and bird watching.

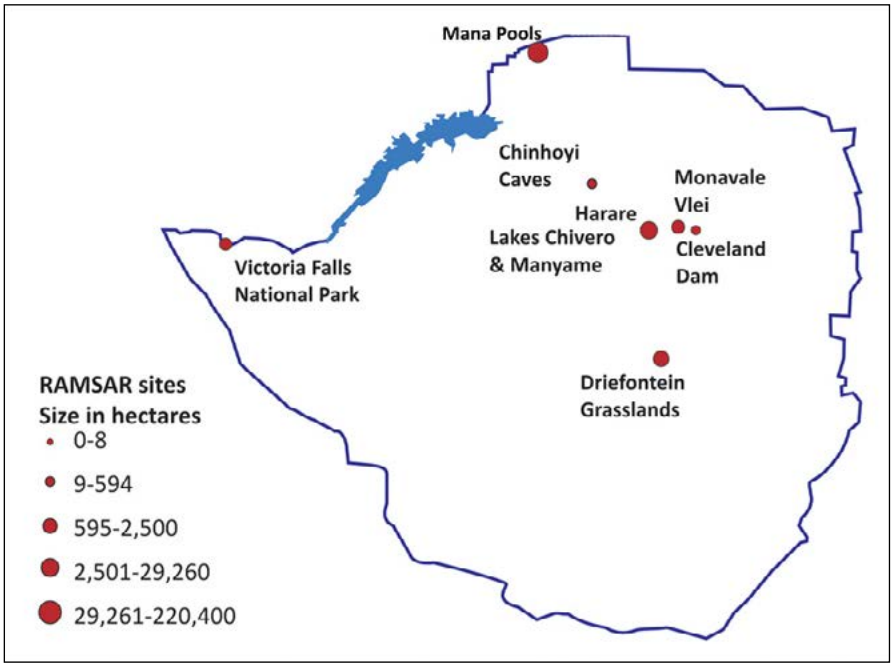
In 2009, there were 1,117 wetlands covering more than 793,000 ha (1.8% of Zimbabwe's total surface area, Figure 9). An estimated 60% of the country's wetlands fall within communal and resettlement areas and are prone to high levels of degradation. In 2011, Zimbabwe became a signatory to the RAMSAR Convention and seven wetlands were designated as RAMSAR Sites – Monavale Vlei, Cleveland Dam, Lake Chivero and Manyame (all in or near Harare), the Chinhoyi Caves, Mana Pools National Park, Victoria Falls National Park and Driefontein Grasslands near Mvuma in the Midlands (Figure 10).

Figure 9: Wetland distribution in Zimbabwe



Source: EMA

Figure 10: Zimbabwe's RAMSAR sites



Adapted from data supplied by EMA

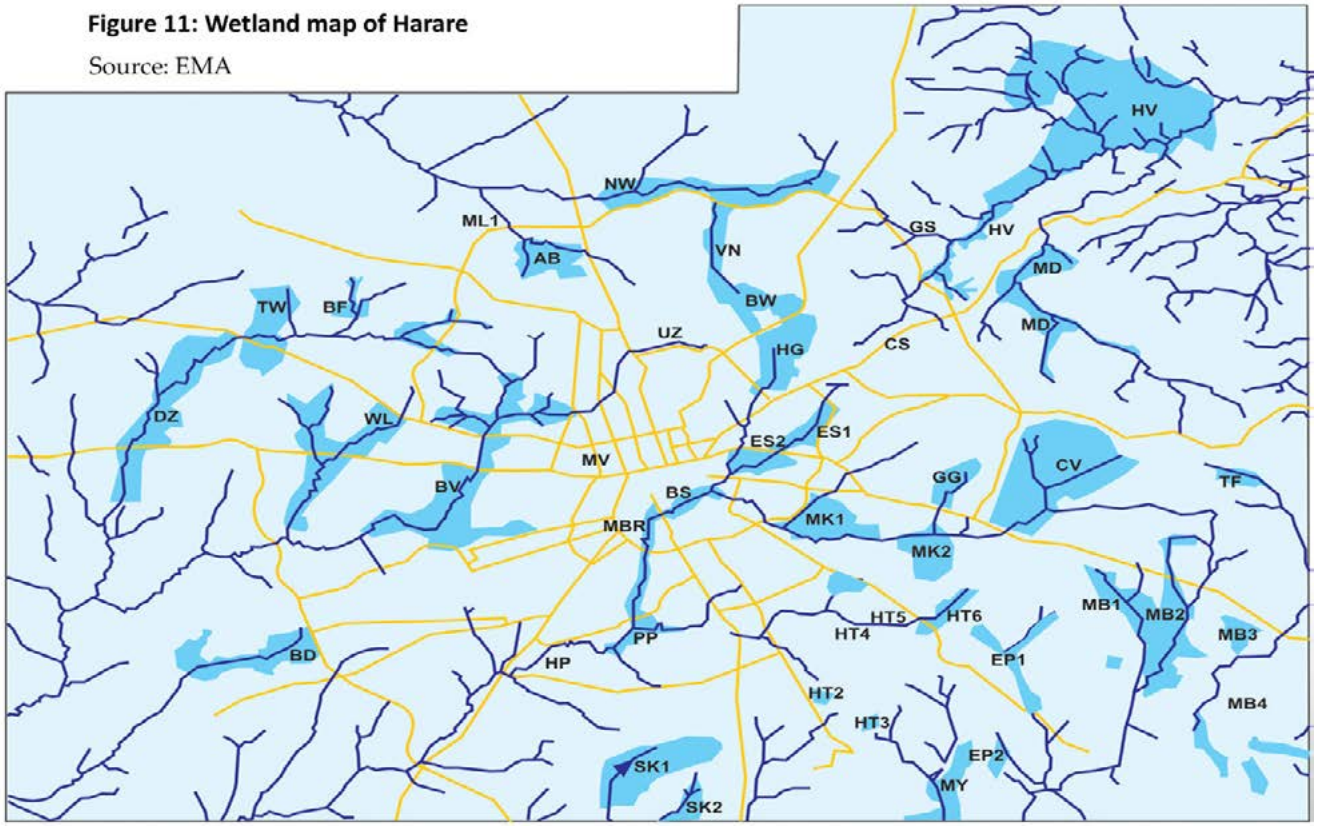
2.4.1 Threats to wetlands

Wetlands in most communal and resettlement areas have been slowly drying up and disappearing under the pressure of unsustainable human activities, such as overgrazing and cultivation, and the effects of climate change. Urban wetlands in particular are threatened by development, although some conservation initiatives by local communities have

helped conserve urban wetlands like Monavale Vlei. In Harare and other urban centres, deterioration of wetland ecosystems is becoming more apparent, mainly due to housing construction, infrastructure development and informal agriculture. The situation in Harare and Chitungwiza is particularly critical, as this conurbation is located in the headwaters of the Upper Manyame river catchment with these wetland ecosystems being the primary source of water feeding the supply impoundments, lakes Chivero and Manyame, downstream (Figure 11).

Figure 11: Wetland map of Harare

Source: EMA



WETLAND CODE

AB – Ashbrittle
BD – Budiriro
BF – Bluffhill
BS – Braeside
BV – Belvedere
BW – Borrowdale West
CS – Chisipite
CV – Cleveland
DZ – Dzivarasekwa
EP – Epworth
ES – Eastlea
GG – Greengrove
GS – Greystone Park
HG – Highlands
HP – Houghton
HT – Hatfield
HV – Helensvale
MBR – Mbare
MK – Mukuvisi
ML – Marlborough
MB – Mabvuku
MD – Mandara
MV – Monavale
MY – Manyame
NS – National Sports Stadium
NW – Northwood
PP – Prospect
SK – Seke
TF – Tafara
TW – Tynwald
UZ – University of Zimbabwe
VN – Vainona
WS – Westlea

Community conservation of Monavale Vlei

Monavale Vlei is just north-west of the Harare central business district. The vei is a headwater of the Marimba River upper catchment wetland ecosystem, which feeds into Lake Chivero. Harare sits on the watershed; the rainfall captured by its vleis flows into the major reservoirs and is used as drinking water after being pumped back up to the capital and its satellite towns.

The vlei is an important breeding site for wetland birds. Members of BirdLife Zimbabwe have monitored the migrant *rallidae* such as the streaky-breasted flufftail (*Sarothrura boehmii*) and the striped crake (*Aenigmatolimnas marginalis*) in Harare's wetlands for more than 60 years. The loss of many of Harare's vlei systems to development has resulted in the reduction of much of the breeding habitat for these bird species, thus making the protection of Monavale Vlei a priority. Further threats from informal agriculture, dumping and poaching led to intensive lobbying of local and national authorities by concerned stakeholders to protect the area formally.

In 2001, threats from proposed horticultural developments prompted the local community, environmental groups and concerned individuals to prevent this from taking place. In 2005, the Saving the Wetlands Taskforce was formed with a mandate to promote protection and conservation of the wetland areas in Harare and its surrounds. Monavale Vlei was selected as the first vlei for conservation and protection. Residents living around Monavale formally constituted the Conservation Society of Monavale. The society worked very closely with BirdLife Zimbabwe and Environment Africa in conserving the vlei. In July 2012, Monavale Vlei was gazetted a protected wetland. The next year Zimbabwe acceded to the RAMSAR Convention on Wetlands and the vlei was accorded RAMSAR site status.

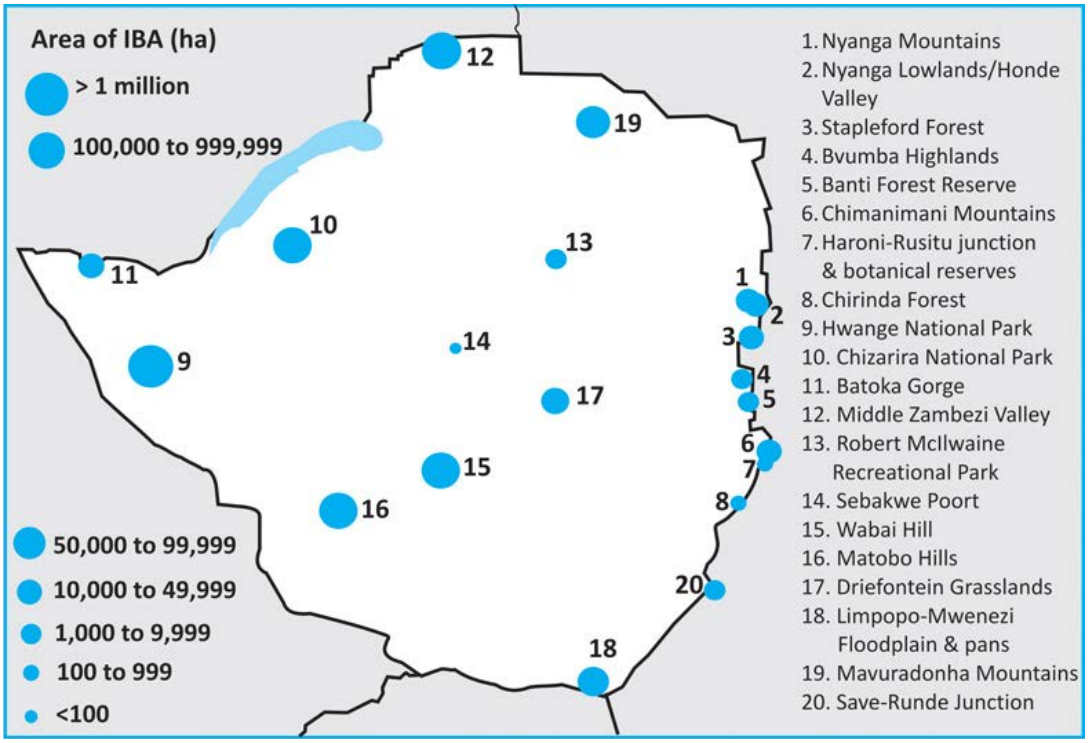
As the headwaters of the Manyame upper catchment

The ongoing destruction of these wetlands will result in the reduced availability of water to this conurbation. Widespread urban agriculture has led to severe siltation of the rivers and streams in the catchment as well as lakes Chivero and Manyame. Excessive use of fertilizer and discharge of industrial effluent and untreated sewage have contributed significantly to the high pollution levels. Rapid demand for urban housing has led to increase in demand for bricks and sand, which has resulted in increased scarring and clearing of land in peri-urban locations of Harare. In the countryside there are moderate levels of wetland degradation. The Environmental Management Agency (EMA) is doing a countrywide review of ecological state of wetlands of Zimbabwe.

2.5 Avifaunal biodiversity

Zimbabwe has more than 670 species of birds. BirdLife Zimbabwe has been monitoring and conserving biodiversity in Important Bird Areas (IBAs) in Zimbabwe. IBAs are globally important habitats designated by BirdLife International criteria for the conservation of bird populations. Zimbabwe has 20 such areas that cover 30,050 km² (Figure 12) This

Figure 12: Zimbabwe's Important Bird Areas



Source: Childes and Mundy 2001

basin, Monavale Vlei and Harare's wetlands hold, store and regulate the flow of water into the downstream impoundments, which in turn supply Harare. They are the primary sources of water for Harare and its environs. The vleis provide a highly effective filtration system that would otherwise require costly treatment. They control water flows, preventing soil erosion and siltation of water courses and reservoirs. Intact vleis are needed to replenish underground water reserves that provide water for boreholes. This is important in Harare as water reticulation issues have led to commercial use of boreholes, which has resulted in the lowering of the water table.

Threats to the conservation of Monavale Vlei and most of Harare's wetlands include cultivation, alien invasive plant species, pollution, illegal dumping, horticulture, fire and poaching. Conservation management has involved the removal of tonnes of garbage and of snares and traps, and communication with – and active engagement of – would-be cultivators, poachers and dumpers. As a result of COSMO's conservation activities, 2004/5 was the last informal agricultural planting season and since then Monavale Vlei has been left undisturbed. In 2009, alien weedy forbs, which appeared after disturbance from cultivation, were removed manually; regrowth is removed annually. The manual removal of alien invasive species has seen the recovery of original wetland grasses in a few years. In addition, the non-indigenous invasive *Sesbania* was removed manually from the Marimba stream.

Conservation of Monavale Vlei is a success story for the conservation of wetlands and is important locally for hands-on education and research in biodiversity and ecology. Visits from schools, training colleges and universities create awareness of wetlands. **– Dorothy Wakeling, Conservation Society of Monavale**

Table 4: Status of threatened bird species of Zimbabwe in 2010 and 2014

Species	Common name	Category	
		2014	2010
Bugeranus carunculatus	Wattled crane	VU	VU
Sarothrura ayresi	White-winged flufftail	CR	EN
Gyps coprotheres	Cape vulture	VU	VU
Torgos tracheliotus	Lappet-faced vulture	VU	VU
Trigonoceps occipitalis	White-headed vulture	VU	VU
Egretta vinaceigula	Slaty egret	VU	VU
Ardeola idae	Madagascar pond-heron	EN	EN
Swynnertonia swynnertoni	Swynnerton's robin	VU	VU
Hirundo atrocaerulea	Blue swallow	VU	VU
Necrosyrtes monachus	Hooded vulture	EN	EN
Gyps africanus	White-backed vulture	EN	NT
Polemaetus bellicosus	Martial eagle	VU	LC
Sagittarius serpentarius	Secretary bird	VU	VU
Balearica regulorum	Grey crowned crane	EN	VU
Bucorvus leadbeateri	Southern ground	VU	VU
Agapornis nigrigenis	Black-cheeked lovebird	VU	VU

CR –critically endangered, EN – endangered, VU – vulnerable, NT – near-threatened, LC– least concern

constitutes 7.7% of the country's total area. Eleven of the country's IBAs are in protected areas and these are Nyanga mountains, Stapleford Forest, Chimanimani mountains, Chirinda Forest, Hwange National Park, Chizarira National Park, Middle Zambezi Valley, Batoka Gorge, Robert Mcllwaine Recreational Park, Matobo Hills and Save-Runde junction. Bvumba Highlands and Haroni-Rusitu Junction are partially protected. The rest of the IBAs have no legal protection.

Bird species are threatened directly by snaring and poisoning. Groom *et al* (2013) report that at least 184 vultures died in Gonarezhou National Park in July 2012 after feeding on a poisoned elephant carcass. A number had their beaks removed for suspected medicinal purposes. Table 4 shows the list of Zimbabwe's threatened bird species. Four species are now endangered compared to two in 2010, and the white-winged flufftail is now critically endangered and even possibly extinct in Zimbabwe. Habitat degradation and land use change are major threats to Zimbabwe's avifaunal biodiversity. A study of population trends finds that the population of the wattled crane (*Bugeranus carunculatus*) declined from 142 in 2004 to 76 in 2010 (Chirara 2011). The decline occurred at the same time that newly resettled farmers converted the grasslands to fields for growing crops. The encroachment of cultivation on the wetlands modified the ecosystem, resulting in habitat changes unfavourable to the breeding of this important bird species.

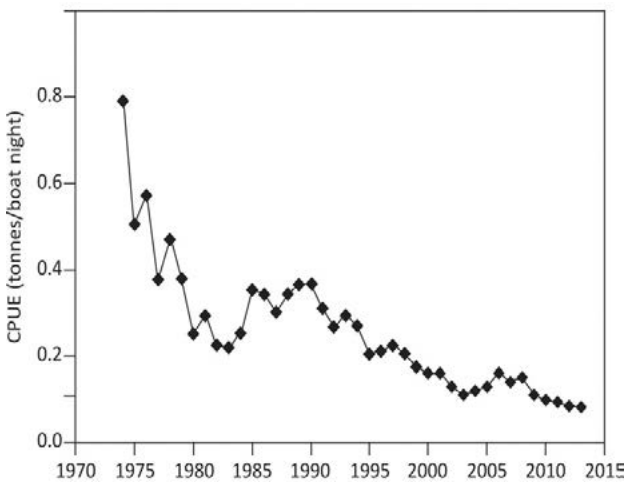
2.6 Aquatic biodiversity

Zimbabwe's aquatic ecosystems cover 31,900 km² (about 0.8% of the total land area) and comprise inland rivers, international rivers, lakes, dams, floodplains, swamps, dambos and pans (Feresu 2010). The most commercially important dam in Zimbabwe is Kariba. The Zambezi, Save, Limpopo and Pungwe are Zimbabwe's international rivers. The aquatic ecosystems are host to diverse flora and fauna, including waterfowl, reptile and fish populations. Siltation levels in most dams and rivers, particularly those found in Natural Regions IV and V (Figure 2), have worsened since 2010 to the extent that the Zimbabwe National Water Authority (ZINWA) has mooted the de-silting of some of them. Dams in and around urban centres are polluted by discharge of untreated effluent from industry, resulting in high eutrophication levels. Acid mine drainage has emerged as a major source of pollution of some of Zimbabwe's river systems (notably the Mazowe, Mupfure, Odzi and Save rivers) since 2011 following the expansion of alluvial mining.

There are 156 fish species, of which 30 were introduced specifically for angling and aquaculture. A thriving fishing industry, particularly on Lake Kariba, supplies 90% of the country's pelagic (offshore) and artisanal (inshore) fisheries (NBSAP 2015). Recent trends show a decline in catches of kapenta (*Limnothrissa miodon*), indicating diminished supply due to overfishing (Figure 13).

High levels of pollution in Zimbabwe's aquatic systems have provided suitable conditions for the spread of

Figure 13: Trend in catch per unit effort (CPUE) of kapenta obtained from Zimbabwean waters of Lake Kariba. CPUE in tonnes per boat night



Data sourced from ZNPWA records

aquatic invasive plant species including the water lettuce (*Pistia stratiotes*) water hyacinth (*Eichhornia crassipes*) and Kariba weed (*Salvinia molesta*). These invasive species have reduced the productivity of the ecosystems through the loss of suitable habitats for fish and diminished their attractiveness (Feresu 2010). Species like the largemouth bass (*Micropterus salmoides*) breed rapidly, posing a threat to commercial fish species such as the red-breasted bream. Other species of concern are the Nile tilapia (*Oreochromis niloticus)* and the recently introduced red claw crayfish (*Cherax quadricarinatus*).

2.7 Agricultural biodiversity

Zimbabwe's climate favours the production of a diverse range of food crops, commercial crops, fruits and livestock. This section deals with the diversity of crops and animals.

2.7.1 Crop diversity

Cereal grains such as maize, sorghum, pearl millet, finger millet and wheat are the major food sources. Since 2013, sugar cane has gained strategic importance as a source of ethanol, which is blended with imported petrol. Tobacco output has been increasing since 2010, by 15% from 144,500 tonnes in 2012 to about 166,600 tonnes in 2013, according to the government budget statement of 2014. The tobacco sector is projected to expand, with 28.7% more registered farmers intending to grow the crop in the 2014-2015 season. This shift from multi-cropping to tobacco will impact on biodiversity in general and agro-biodiversity in particular as there is the heavy reliance on fuelwood for curing.

The Department of Research and Specialist Services and several companies are producing a range of crop seed varieties (Table 5). The national gene bank has a mandate to carry out conservation of plant genetic resources important for food and agriculture and promotes its sustainable use. As at April 2014 the gene bank held 5,864 accessions drawn as a representative sample of the national plant genetic resources important for food and agriculture.

2.7.2 Domestic animal biodiversity

The main livestock found in Zimbabwe are cattle, sheep, goats and pigs. Smallholder farmers in the communal sector hold most of the livestock. Cattle are the most abundant livestock in all farming sectors, followed by goats. Population trends from 2000 to 2013 are indicated in Figure 14. There was a decline in the cattle and goat population in 2002, but populations of cattle, goats and sheep have been stable since then.

Indigenous food and livestock varieties are especially important as they are more tolerant to disease and changes in climate. Indigenous livestock breeds

Table 5: Crop biodiversity in Zimbabwe

CROP	Number of released varieties on the market	Companies producing crop varieties
Maize (*Zea mays*) white hybrids	95	11
Maize yellow hybrids	21	5
Maize open-pollinated varieties	10	3
Tobacco *Nicotiana* spp.	13	1
Barley *Hordeum vulgare*	9	1
Beans *Phaseolus vulgaris*	8	4
Cow peas *Vigna unguiculata*	5	3
Groundnuts *Arachis hypogaea*	9	2
Bambara nuts *Vigna subterraneanea*	2	1
Open-pollinated sorghum *Sorghum bicolor*	5	2
Hybrid sorghum *Sorghum bicolor*	4	2
Rice *Oryza sativa*	3	1
Soya bean *Glycine max*	17	3
Sunflower *Helianthus* spp.	8	3
Wheat *Triticum aestivum*	17	3
Potatoes *Solanum tuberosum*	9	2
Cotton *Gossypium hirsutum*	14	2
Pearl millet *Pennisetum glaucum*	4	2*
Finger millet *Eleusine coracana*	2	2 *
Pastures		Dept of Research & Specialist Services
Eragrostis curvula		
Panicum maximum		
Paspalum quenoarum		
Paspalum notatum		
Paspalum plicatulum		
Setaria sphacelata		
Napier grass *Pennisetum purpureum*		
Pasture legumes		
Desmodium uncinatum		
Lotononis bainesii		
Macroptilium atropurpureum		
Stylosanthes guianensis		
Macrotyloma axillare		
Glycine wightii		

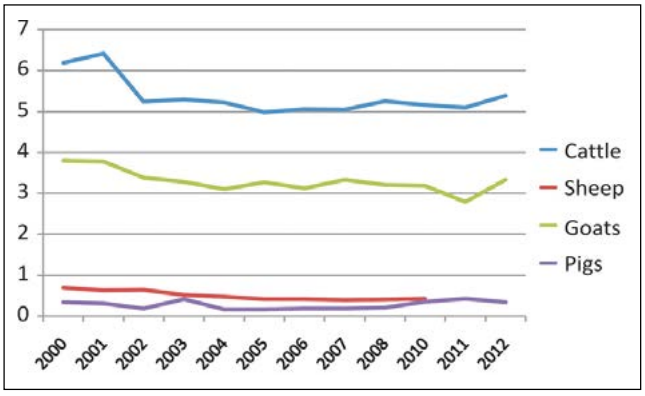
Source: Department of Research and Specialist Services 2014
* Matopos and Department of Research and Specialist Services

– Mashona, Tuli and Nguni – are numerically predominant and are kept mostly by smallholder farmers in communal and resettlement areas. The Mashona are most widely distributed in eastern and central Zimbabwe, while Tuli are predominant in Matabeland where they originated (Feresu 2010). These indigenous breeds have provided gene stock for cross-breeding with exotic breeds to boost production, and the current stock of cross-breeds has become prevalent in communal areas within Natural Regions IV and V. Exotic beef breeds, such as Aberdeen Angus, Brahman, Beefmaster, Hereford, Sussex, Charolais, Limousin and Simmental, are found on a few commercial farms. Exotic dairy breeds, of which Holstein–Friesian is the most abundant, make up 10% of the total dairy population. Jersey, Guernsey, Aryshire and Red Dane dairy cattle occur in very small numbers and on few commercial farms.

Small livestock such as goats, chicken, sheep and pigs are common in the drier regions (IV and V), providing meat and income for households. The major goat breeds are Mashona and Matabele (indigenous), Boer, Angora and Saanen (exotic). Sheep species introduced for meat production include Dorper, Merino, Wiltiper and Border Leicester, while Sabi is the only indigenous sheep breed found in the communal lands (Feresu 2010). There are four exotic pig breeds, namely Landrace, Large White, Dalland and Duroc, and one indigenous breed, the Mukota.

There are many indigenous poultry varieties, but they have not been fully documented. They are the traditional source of meat in many rural homes and have been exchanged between households over generations. However, some are at risk of extinction due to the emergence of fast-growing exotic breeds. Zimbabwe has the capacity to produce exotic poultry breeds for commercial production of meat and eggs. The Poultry Producers' Association has registered breeders who produce broilers and pullets from parent lines of Rhode Island Red cross-breeds, Plymouth and Cornish fowls. Other kinds of poultry found in Zimbabwe are turkeys, guinea fowl, geese, pigeons and ducks; they are mainly kept for subsistence purposes.

Figure 14: Population trends of major livestock species (millions) between 2000 and 2013



Data sourced from the Livestock Division in the Department of Research and Specialist Services, Ministry of Agriculture

2.7.3 Conservation of agricultural genetic resources

The national gene bank conserves germplasm as a back-up to farm savings and in case floods, fires, pests, diseases or other catastrophes destroy farm-saved germplasm (Table 6). It addresses on-farm conservation projects in which it can introduce new germplasm as a new variety or as a source genetic make-up that enhances farmers' varieties. For crop development, researchers and breeders work with the gene bank to carry out preliminary evaluation of its germplasm. This enables the institution to profile all the accessions in the gene bank and make them usable for further crop development by breeders and researchers.

2.7.4 Threats to agriculture biodiversity

According to the Ministry of Agriculture, Mechanization and Irrigation Development (MAMID), agricultural biodiversity of Zimbabwe has fluctuated during the past five years. Having promoted mono-cropping for decades, Zimbabwe has since 2010 shifted toward encouraging multi-cropping, especially through its conservation agriculture policy. With greater uptake of this policy, agriculture landscapes are likely to be better managed, resulting in improved crop and livestock diversity.

Zimbabwe has been producing a variety of crops and fruits with yearly production figures varying according to seasonal weather. Table 7 shows the variety of crops and fruits produced in the 2011-2012 and 2012-2013 agricultural seasons. Traditional crop varieties, such as yams, rice and millet, are threatened by smallholder farmers' shift toward crops with high commercial value. This and the emerging threat of climate change have prompted the MAMID and civil society to encourage communities to use drought-tolerant crop and livestock varieties. This initiative to diversify from the staple maize crop resulted in an increase in the land under sorghum, millet and sugar beans production in 2012/13 compared to the 2011/12 (Table 7).

With increased attention to the potential threats of climate change on food security, the government stepped up re-introduction of drought-tolerant crop and livestock varieties by establishing a seed bank and strengthening national breeding capability. Through a pilot project on coping with drought (CwD) implemented by the then Ministry of Environment and Natural Resources Management in partnership with the United Nations Development Programme (UNDP), communities in the drought-prone south-east lowveld have received technical support in cultivating small grains.

In 2011, the CwD project trained 3,000 households in the growing of drought-tolerant crops such as cassava and sorghum. These efforts have resulted in an increase in the cultivation of indigenous crop varieties throughout the districts in the lowveld. The project is part of Zimbabwe's efforts to enhance coping and adaptation to climate change and has proved so successful that the government intends to replicate it in all the dry and arid areas of Zimbabwe with the support of the Global Environment Facility (GEF).

The MAMID has stepped up efforts to encourage multiple cropping and agroforestry with technical capacity building for communities to implement the conservation agriculture policy. Crop biodiversity is set to improve countrywide if success stories in pilot communities are replicated.

Table 6: Germplasm conserved at the National Gene Bank of Zimbabwe as of April 2014

Common name	Scientific name	Total
Sorghum	*Sorghum bicolor*	1,393
Pearl millet	*Pennisetum glaucum*	1,038
Finger millet	*Eleusine coracana*	762
Gourd	*Lagenaria siceraria*	667
Maize	*Zea mays*	141
Watermelon	*Citrullus lanatus*	158
Cow melon	*Citrullus lanatus* var. *citroides*	152
Bambara groundnuts	*Vigna subterraneanea*	131
Okra	*Hibiscus esculentus*	38
Baobab	*Adansonia digitata*	1
Onion	*Allium cepa*	3
Pigweed	*Amaranthus* spp.	29
Groundnuts	*Arachis hypogea*	29
African chewing gum/ snot apple	*Azanza garckeana*	1
Blackjack	*Bidens biternata*	1
Ethiopian mustard	*Brassica* spp.	26
False sesame	*Ceratotheca sesamoides*	6
Cowpea	*Vigna* spp.	173
Spider flower	*Cleome* spp.	17
Coffee	*Coffea arabica*	3
Jute/bush okra	*Corchorus* spp.	27
Slender leaf rattlepod	*Crotalaria ochroleuca*	1
Beans	*Phaseolus vulgaris*	55
	Ponicum spp.	1
Caster bean	*Ricinus communis*	2
Common elderberry	*Sambucus canadensis*	1
Sesame	*Sesamum* spp.	8
Devil's apple/grey bitter apple/ bitter tomato/bitterberry	*Solamum* spp.	13
Ctenolepis	*Ctenolepis cerasiformis*	1
Common burbush	*Triumfetta annua*	5
Pumpkin	*Cucurbita* spp.	127
Melon/cucumber	*Cucumis* spp.	50
Soya beans	*Glycine max*	43
Sunflower	*Helianthus annuus*	38
Tomato	*Lycopersicon esculentum*	2
Moringa	*Moringa oleifera*	1
Rice	*Oryza* spp.	543
GRAND TOTAL		**5,867**

Source: Department of Research and Specialist Services 2014

2.8 Other threats to biodiversity

Poverty is a major factor in biodiversity loss in Zimbabwe's ecosystems because it has led to unsustainable exploitation of the country's natural resources. With the need for accelerated economic development to address high unemployment and declining standards of living, developers have little regard for negative environmental consequences despite the existence of protective legislation and regulatory mechanisms. Drivers of ecosystems change in Zimbabwe contributing directly and indirectly

Table 7: Hectares planted to crops in 2012/2013 in comparison to 2011/2012

Crop	2012/2013	2011/2012	% increase or decrease
Maize	1, 328,374	1,689,789	27
Sorghum	260,115	279,239	7
Pearl millet	129 ,759	163,286	25
Finger millet	26,459	39,265	48
Soya beans	59,179	51,869	14
Tobacco	88,623	76,359	16
Cotton	241,849	432,901	44
Groundnuts	262,869	335,586	22
Sunflower	12,359	12,783	3
Sugar beans	38,934	18,366	112
Bambara nuts	93,841	93,758	0
Tea	8,162	8,162	0
Coffee	654	649	0
Banana	4,643	4,583	1
Citrus	6,172	6,112	1
Irish potato	10,700	10,600	1
Macadamia nuts	3,384	3,334	0
Apples	224	224	0
Mango	3,651	3,462	5

Source: Ministry of Agriculture, Mechanization and Irrigation Development 2013

to biodiversity loss include land use change, climate change, rapid urban expansion, mining, veld fires and invasive alien species, poaching and unsustainable exploitation of resources.

2.8.1 Over-exploitation of natural resources

Deforestation has been occurring at alarming levels since 2011 in peri-urban areas due to commercialization of fuelwood by desperate urban residents in the face of frequent power outages. Non-timber forest products, such as honey and wild fruits, that provide safety nets for rural communities during drought years, are being increasingly commercialized by unscrupulous urban dealers. Medicinal plant species have been unsustainably harvested with a few of the 500 known species now on the brink of extinction (Madzara 2013). Overfishing has resulted in declining fish populations in the Zambezi River and Lake Kariba, causing reduced fish catches (Mahere 2012).

2.8.2 Land use change

Changes in land use have been the main driver for ecosystem change, especially through expansion of agriculture. The extent of land under new settlement since 2010 has not increased significantly, save for limited new allocations under the wildlife-based land reform programme. However, an increase in the population of newly resettled areas has resulted in accelerated clearance of forests and woodlands for cultivation. Newly settled farmers on former game farms and in plantations and forests have converted land to cropping, which has contributed to habitat loss for wildlife (MWEC 2013).

There has been a rapid expansion of residential areas in most urban centres since 2010. Illegal settlements on wetlands have reduced water supplies and biodiversity. Increased land pressure due to intensification of agriculture and its expansion into grazing lands, wetlands and mountain slopes in areas such as Mutasa in Manicaland, Seke in Mashonaland East and Mazowe in Mashonaland Central has resulted in fragmentation of land. This has resulted in the loss of land cover and an associated loss of biodiversity. Land degradation and loss of biodiversity have also increased due to weak tenure arrangements in most resettlement areas and inadequate institutional arrangements for natural resource management.

2.8.3 Climate change

In recent years, the effects of climate change in Zimbabwe have been seen in severe droughts, floods in low-lying areas and shifts in seasons. The increased incidence of droughts has caused lowering of the water table, which has led to changes in wetland conditions and habitat loss. The rise in mean temperatures experienced over the past decade may affect species populations. Recurrent droughts attributed in part to changes in weather patterns have reduced nutrition, resulting in high mortality of wildlife and livestock and poor calving, kidding and lambing rates.

2.8.4 Invasive alien species

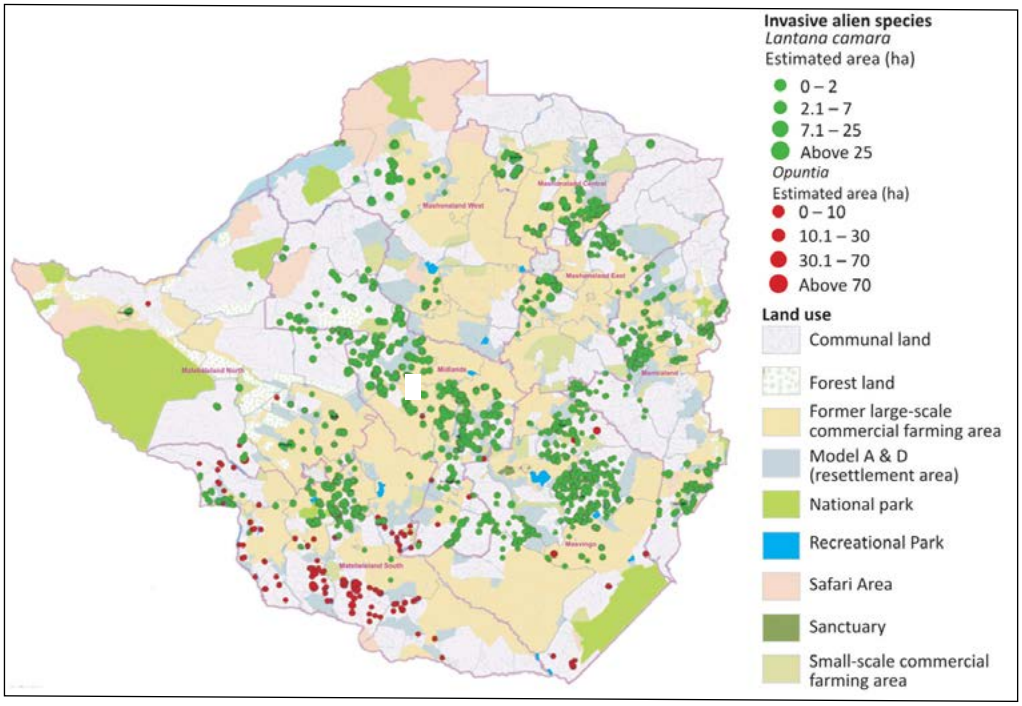
Despite the widespread occurrence of invasive alien species in Zimbabwe, no comprehensive data on plant and animal invasive species are available. Experts agree, however, on the damage that invasive alien species cause to croplands, grazing land, forests and aquatic ecosystems. Plants that were introduced for ornamental purposes (mainly cacti) have reduced the livestock carrying capacity of grazing lands in Zimbabwe's communal lands. Fast-growing exotic tree species ,such as pine (*Pinus patula*), wattle (*Acacia mearnsii*), *Lantana camara*, strawberry guava (*Psidium cattleianum*), guava (*Psidium guajava*), gum trees *(Eucalyptus*), *Jacaranda mimosifolia,* white cedar (*Melia azedarach*) and cypress, are slowly becoming invasive in the Afromontane forests, grasslands, miombo woodlands and streambanks (MEWC 2013)

A study by the EMA in 2013 revealed that the most common invasive alien species in the country is *Lantana camara*. Unlike other invasive species that invade degraded land, *Lantana* is found to be prevalent in moist areas. The study recorded incidences of occurrence of 99% in Mashonaland Central, 96.95% in Midlands and 43.8% in Matabeleland South. The cholla cactus, *Opuntia fulgida* (Figure 15), is mainly found in Matabeleland South, predominantly in the districts of Beitbridge and Gwanda, with isolated cases recorded in Insiza, Bulilima and Matobo.

The distribution of *Lantana* and *Opuntia* is shown in Figure 16. The EMA has mapped the predicted potential distribution of *Opuntia fulgida* based on the maximum entropy model (Figure 17). In Matabeleland South, *Opuntia fulgida* had a frequency occurrence of 33.8%; *Opuntia aurantiaca* 9.6%, *Opuntia imbricata* 9.2% and the night-blooming cactus (*Harrisia martini)* 1.5%. *Opuntia fulgida* has reduced the quality of rangeland for grazing animals and has invaded approximately 3,000 ha in that province. In the two districts, 2,355 ha were infested, affecting 1,500 households. The plant has also contributed to

Figure 15: The cholla cactus, *Opuntia fulgida*

Figure 16: Distribution of the alien invasive *Lantana camara* and *Opuntia* spp. in Zimbabwe



Source: EMA

a reduction in small livestock population as it kills slowly due to impaired mobility caused by the sharp thorns.

2.8.5 Veld fires

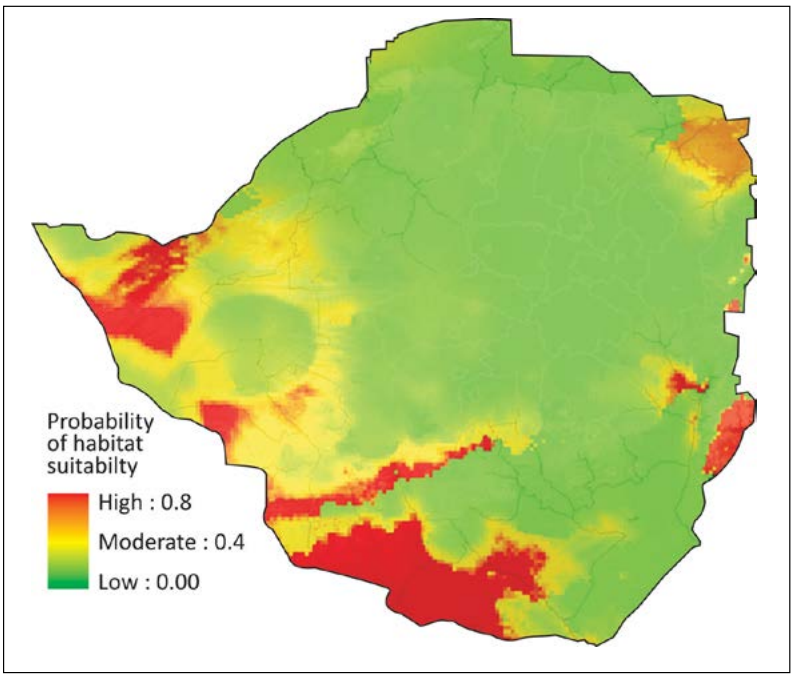
Veld fires are a major threat to biodiversity (Nyamadzawo *et al* 2013). Each year, Zimbabwe loses an average of 900,000 ha to veld fires, most of them in resettlement areas. In 2010, the Forestry Commission reported that 79,000 ha of protected indigenous forests were burnt. The trend in occurrences of veld fires between 2000 and 2013 is shown in Figure 19.

Countrywide there has been an increase in the occurrence of uncontrolled veld fires. Having declined to about 700,000 ha in 2011, the area affected by fire dramatically increased to more than 12 million ha in 2012.

The national incidence of veld fires in 2013 is shown in Figure 18 and the correlation of fire incidences for 2012 and 2013 in different land use categories is shown in the accompanying graph. For both years, uncontrolled fires have been more prevalent in the resettlement areas, presumably due to slash-and-burn land clearance for cropping.

In addition, natural resource management systems are still inadequate due to weak security of tenure, thereby compromising environmental law enforcement at local levels. In 2013, however, there was a decline in the occurrence of fires in communal areas. The decline may reflect the success of fire management measures that the government has started implementing, including a nationwide awareness-raising campaign about the dangers of fire, improved fire monitoring aided by geo-information systems, and capacity building of community teams to fight fires.

Figure 17: Predicted potential distribution of *Opuntia fulgida* based on the maximum entropy model



Source: EMA

2.8.6 Mining

Zimbabwe has vast mineral resources and since 2010 has witnessed a dramatic increase in mining

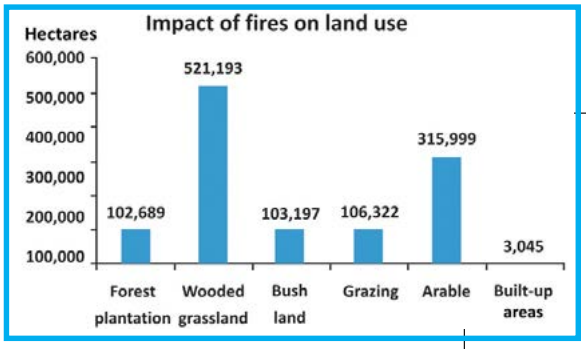
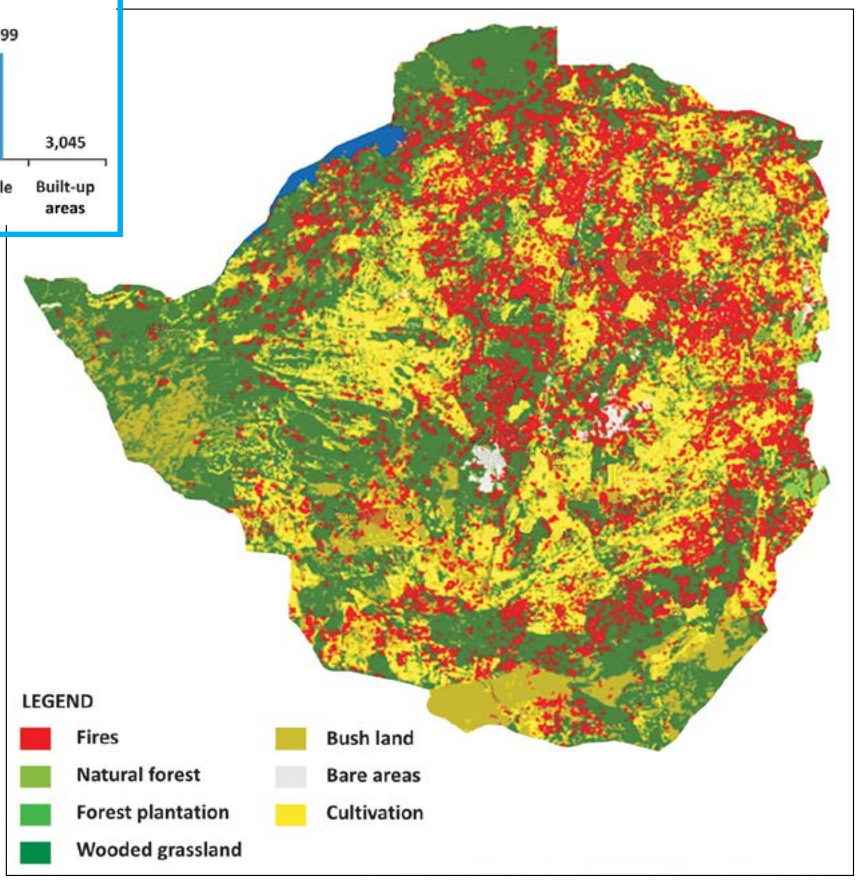


Figure 18: Veld fire occurrences and land use categories affected in 2013



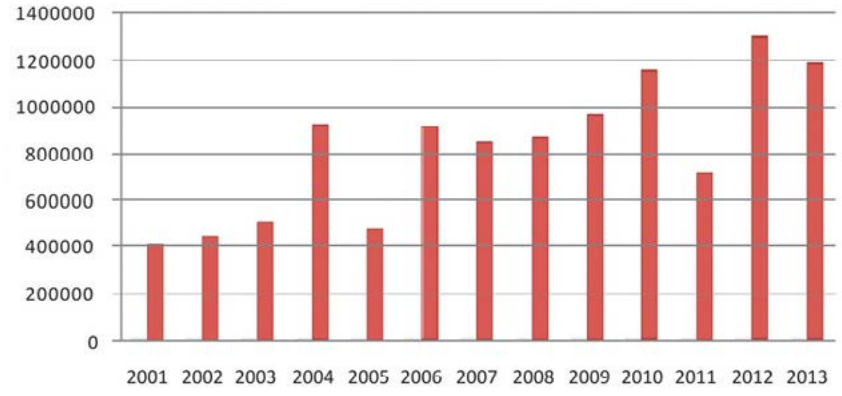
Source: EMA

activity, with recent discoveries of gold in parts of Mashonaland East, Midlands and Mashonaland Central. Open-cast chrome and coal mining has increased in Midlands and parts of Matabeleland. More than a million people are panning gold illegally along rivers, clearing trees and digging in river beds, which result in soil erosion, landslides and siltation of water bodies. Alluvial mining activities have increased throughout Zimbabwe, particularly in major river catchments such as Mazowe, Mutare, Munyati, Angwa, Sanyati, Ruenya, Umzingwane and Runde. Before 2000, most small-scale miners were using hand-panning methods. Since 2010, however, external investors have received special grants to use machinery to dredge the river beds. This and the use of mercury, iron and cyanide to process ore have damaged ecosystems through pollution and degradation among other challenges, thereby depriving communities of the benefits of important ecosystem services.

Other adverse impacts of alluvial mining are the loss of grazing land and woodlands and the attendant loss of biodiversity. Mineral exploration in protected areas such as Hwange and Mana Pools national parks for coal and coal-bed methane has led to land use conflicts with conservancies. For example, conservancy owners are lobbying the government to address the harmful effects of mining on wildlife movements and breeding in the Gwayi Valley Conservancy.

Other concerns relate to the potential biodiversity loss caused by the permanent transformation of landscapes brought about by open-cast mining. For example, open-cast mining in the catchment of the Gwayi-Shangani river system has triggered fears of pollution and siltation of waterways, increased and easier access for poachers and expanding encroachment of human populations on undisturbed habitats (USAID 2012).

Figure 19: Veld fire incidence 2000-2013 (hectares)



Source: EMA

3. IMPLICATIONS FOR HUMAN WELL-BEING

3.1 Importance of biodiversity in Zimbabwe's protected areas

The importance and value of biodiversity in Zimbabwe's protected areas are dependent on the quality of ecosystems and their functionality in terms of services and products. The diverse nature of Zimbabwe's ecosystems provides for a variety of benefits from plants, animal species and populations as well as the aesthetic characteristics.

At the national level, the contribution of the natural resource endowment to the economy of Zimbabwe has yet to be adequately valued. However, in 2013 the MEWC with GEF support through the UNDP commissioned a study on monetary quantification of ecosystem products and services in protected areas as an input to the review of the National Biodiversity Strategy and Action Plan. The study, called the "Government of Zimbabwe Monetary Quantification of Ecosystem Products and Services"(Madzara 2013), has provided much insight on the importance of biodiversity in protected areas.

Biodiversity is the basis of survival of most of Zimbabwe's people, who live in rural areas adjacent to protected areas and who mostly exploit natural resources for their livelihoods. The poor macro-economic environment in Zimbabwe between 2000 and 2008 has increased their dependency on the natural products they derive legally and illegally from protected areas.

In 2012, total export earnings from biodiversity products and photographic safaris amounted to $96.95 million, according to a Reserve Bank of Zimbabwe estimate; of this, game products such as skins, hides, and trophies earned between $42 million and $49 million, and the ZPWMA realized $216,615 from the direct sale of game products from its warehouse (Madzara 2013). In 2011, fishing permits contributed 4.7% – an estimated$900,480 – of total income for ZPWMA, according to the authority. In 2013, there were about 30 commercial bream-fishing enterprises – 22 of them in Chivero and Darwendale dams – and 295 kapenta commercial fishing permit holders and 1,272 artisanal fishermen operating in Lake Kariba (Madzara 2013).

Revenue generation has been used as a proxy indicator of value of the protected areas because of the lack of national data on the value of benefits to users of protected areas products and services. Table 8 presents revenue figures derived by sectors involved in protected area management. Data for 2013 were not made available, but the results show an increase in financial returns from permits and concession and hunting fees for ZPWMA and the Forestry Commission, while the proceeds of the 2% tourism levy collected by the Zimbabwe Tourism

Table 8: Revenue from use of protected areas 2009 to 2012

Responsible organisation	Revenue generated (US$)			
	2009	2010	2011	2012
ZPWMA	11,484,043	16,998,003	18,700,146	-
Forestry Commission	1,458,049	1,454,030	-	-
CAMPFIRE Association	1,012,174	1,306,423	1,924,404	2,539,048
Zimbabwe Tourism Authority	2,671,964	4,336,933	3,330,596	3,968,249
TOTAL RECEIPTS	**16,626,230**	**24,095,389**	**23,955,146**	**6,507,297**

Source: Madzara 2013

Table 9: Park arrivals and tourism receipts 2009 to 2012

Year	National tourist arrivals	Arrivals in parks	% of visitors to parks of total arrivals	Tourism receipts	Estimated revenue from parks-related visitor activity
2009	2,017,264	346,853	17.2	$523 million	$90 million
2010	2,239,165	318,156	14.2	$634 million	$90 million
2011	2,423,280	307,917	12.7	$662 million	$84.1 million
2012	1,794,230	493,327	27.5	$779 million	$214.2 million

Source: ZTA and ZPWMA visitor statistics

Table 10: Trends in hunting revenue from CAMPFIRE districts

Year	All income from CAMPFIRE	Hunting revenue
2010	$1,348,242	$1,306,423
2011	$1,924,404	$1,896,754
2012[1]	$2,539,048	$2,064,075

Source: Madzara 2013
[1] Estimate from RDC CAMPFIRE Coordinators Workshop

Table 11: Estimated income from safari hunting in gazetted forests

Hunting area	Estimated annual income based on allocated quota
State land C	$50,455
Umguza Forestry	$49,050
Forestry Area Fuller	$92,380
Forestry Land Gwaai/Bembesi	$124,900
Forestry Land Ngamo/Sukumi	$292,400
Forestry Land Sijarira	$120,340
Forestry Land Kazuma/Panda Masuei	$194,195
Forestry Land Kavira	$103,745
Forestry Land Inseze Extension	$36,935
Forestry Land Gwampa	$48,000
TOTAL FROM GAZETTED FORESTS	**$1,112,400**

Source: Madzara 2013

Authority (ZTA) have also grown. These statistics show the improvement in the tourism sector, which from 2008 to 2010 had faced huge challenges due to negative international perceptions of Zimbabwe.

Zimbabwe's tourism industry is largely dependent on the services and products derived from protected ecosystems. By 2012 the sector accounted for 10% of GDP, according to the government's 2014 budget statement. Table 9 shows the general increase in tourist arrivals in parks and wildlife estates and revenue flows since 2009. Successful nature conservation efforts have given rise to growth in the ecotourism industry, particularly in the Zambezi Valley. The rich wildlife resources have allowed for greater private investment in wildlife conservation, with revenue from hunting and other non-consumptive activities increasing from $8 million in 2009 to $10 million in 2010 and $12 million in 2011, according to safari operators (Madzara 2013).

Crocodile farming is a major income earner through the sale of skins and eggs. The skins are mostly exported to Europe as salted belly skins, back skins and tails. The total number of skins exported ranged between 75,000 to just above 90,000 between 2003 and 2011 (Figure 20). In 2012, Zimbabwe earned more than $21.23 million compared to $21.83 million in 2011 (Madzara 2013). The Lower Zambezi aquatic ecosystem, namely Sapi-Chewore areas, is also a key source of eggs for crocodile farmers. In 2012, the Lake Kariba aquatic ecosystem provided 78% of total egg collections (Madzara 2013). Total revenue accruing from eggs in 2013 was $273,450 based on an average price of $5 per egg.

3.2 Importance of biodiversity to communities

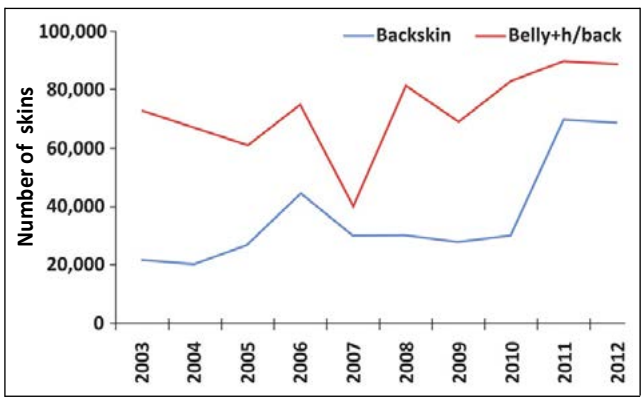
For communities living next to protected areas, the natural ecosystems have continued to yield food, medicines, fuelwood and materials for crafts, and have provided for their cultural and spiritual needs. Community participation in wildlife management through CAMPFIRE has supported various ecotourism projects benefitting several communities throughout Zimbabwe (Gandiwa *et al* 2013b). The CAMPFIRE programme area constitutes 47.1% of the total protected area network and covers 55,208 km^2. Hunting in CAMPFIRE areas generated more than $2.064 million in revenue in 2012 (Table 10). The trends indicate that hunting is the major source of revenue for CAMPFIRE districts and has been increasing since 2010.

Zimbabwe's forests are found under different land use systems and constitute about 42.8% of the Zimbabwe's land area (Forestry Commission 2010). Protected areas contain about 6 million ha of woodland, while gazetted forests cover some 0.8 million ha. Table 11 shows some of Zimbabwe's gazetted forests, which form important habitats for commercially valuable wildlife (through sport hunting) and generate about $1,112,400 annually (Madzara 2013).

3.3 Rise in unemployment and poverty

Although the political environment stabilized and economic performance improved at the beginning of 2010, poverty remains a big challenge in Zimbabwe. Economic performance and recovery have remained inadequate, with GDP declining from 11.9% in 2011 to 10.6% in 2012 and 3.4% in 2013, while capacity utilisation decreased from 57% in 2011 to 39% in 2013 (GoZ 2013b). This has contributed to a reduction in formal employment. Employment in the manufacturing sector decreased from 137,000 in

Figure 20: Crocodile skins exports, 2003-2012



Source: Crocodile Farmers Association of Zimbabwe 2012

2010 to about 126,000 in 2012 (www.zimstat.co.zw/dmdocuments/Labour/LabourQ12013.pdf).

Agricultural production generally declined from 2009 to 2011 because of challenges relating mainly to input support and finance. In 2011, about 76% of rural households were poor compared to 38.2% in urban areas (ZimStat 2012).

It is also observed that 62.6% of Zimbabwean households are deemed poor, while 16.2% of them experience extreme poverty. Statistics show that 30.4% of rural people in Zimbabwe experience extreme poverty compared to 5.6% in urban areas.

Faced with such challenges, people in the rural areas have increasingly engaged in unsustainable livelihood strategies, such as cultivation in marginal areas, alluvial mining and commercialisation of forest and non-forest products. In urban areas, illegal sand abstraction, informal brick moulding, streambank cultivation, deforestation of peri-urban areas and illegal settlements on wetlands are some of the results of increasing poverty and lack of alternative livelihoods. These activities contributed to increased environmental degradation and modification or loss of habitats, ultimately leading to a loss of biodiversity in fragile ecosystems.

4. THE NATIONAL BIODIVERSITY STRATEGY AND ACTION PLAN, AND ITS IMPLEMENTATION

A revision of the NBSAP took place concurrently with the production of this report. Progress is reported in the implementation of the 2000 strategy and action plan and of the CBD Strategic Plan 2011-2020 at the national level. Priority issues affecting biodiversity conservation in Zimbabwe were identified. The six major prioritized biodiversity issues are shown in Table 12.

Zimbabwe's national biodiversity targets for 2020 are shown in Table 13. The identified priority issues were taken into consideration during the development of the targets. Stakeholder consultation workshops were held to review the implementation of the 2000 NBSAP. Although several challenges arise in the eimplementation, including the economic downturn in Zimbabwe during the last decade, notable progress has been made in most of the strategies as seen in the review section in Appendix A.

Table 12: Prioritization of Zimbabwe biodiversity issues

Priority issues	Reason for ranking
Land use and land use systems	Land use greatly affects biodiversity management across the different land use systems.
Poor coordination in policy implementation	Poor coordination of policy implementation and enforcement among sector agencies is stifling progress and creating conflicts in biodiversity management. This is despite the fact that Zimbabwe has excellent policies and laws that speak to biodiversity and environmental issues.
Mainstreaming biodiversity into planning processes	Biodiversity is at the centre of Zimbabwe's national development agenda. It should therefore be mainstreamed into all facets of development planning (macro and national, sector and community levels). It is essential that all other legislation is aligned and harmonised with the Environmental Management Act.
Innovative biodiversity financing	Innovative approaches to biodiversity financing: can biodiversity pay for itself and how can it be made bankable? How much is Zimbabwe spending on biodiversity today and how can the situation be improved with innovative financing?
Biodiversity and business	Integrate natural resource accounting in all business, support environmentally friendly production systems and provide incentives for cleaner product ion. Communication of biodiversity messages in a concise, understandable and effective way remains a major challenge for the business sector. It is therefore critical that good biodiversity stewardship is nurtured and underpinned by a clear communication strategy that speaks to each of the prioritized biodiversity issues.
Research and development	Zimbabwe needs to build scientific knowledge, including a credible database for monitoring biodiversity.

Table 13: National biodiversity targets

Aichi strategic goal	National target
Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society.	**Target 1:** By 2020, at least 75% of the population has been made aware of the values of biodiversity and the steps that can be taken to conserve and use it sustainably.
	Target 2: By 2020, biodiversity has been mainstreamed into all seven sectors (mining, agriculture, health, manufacturing, transport, energy and tourism) and incorporated into national accounting and reporting systems.
Goal B: Reduce the direct pressures on biodiversity and promote sustainable use.	**Target 3:** By 2020, the rate of loss of natural habitats, including forests, has been reduced by at least 50%.
	Target 4: By 2020, ecosystem-based approaches to aquatic resources management are being applied on Lake Kariba and other water bodies so as to avoid overfishing, to enable the recovery of fish stocks, and to reduce loss of indigenous species.
	Target 5: By 2020, 60% of areas under agriculture, aquaculture and forestry are being managed sustainably, ensuring conservation of biodiversity and sustainable land use.
	Target 6: By 2020, integrated pollution prevention and control strategies are in place to reduce detrimental effects to ecosystem functioning and biodiversity.
	Target 7: By 2020, the threats to biodiversity from Invasive alien species have been assessed and measures put in place to control and manage their impact.
	Target 8: By 2020, adaptation and mitigation strategies are being implemented to reduce the impact of climate change on vulnerable ecosystems and communities.
Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity.	**Target 9:** By 2020, at least 28% of Zimbabwe's terrestrial and inland water under protection is being maintained and conserved, and protected area connectivity is being enhanced through integrated resource management.
	Target 10: By 2020, the loss of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
	Target 11: By 2020, strategies have been developed and implemented to conserve and maintain cultivated, farmed and domesticated genetic resources and their wild relatives, including other socio-economically and culturally valuable species.
Goal D: Enhance the benefits to all from biodiversity and ecosystem services.	**Target 12:** By 2020, policies and strategies are being implemented to maintain and restore ecosystem integrity and reduce ecosystems degradation to enhance the livelihoods and well-being of all Zimbabweans, especially those of women, indigenous and local communities, and the poor and vulnerable.
	Target 13: By 2020, desertification is being combated and ecosystem resilience enhanced through conservation and restoration of degraded ecosystems.
	Target 14: By 2020, the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization has been acceded to and domesticated.
Goal E: Enhance implementation through participatory planning, knowledge management and capacity building.	**Target 15:** By 2015, the National Biodiversity Strategy and Action Plan (NBSAP) has been updated and adopted as a policy instrument and implementation has begun.
	Target 16: By 2020, the traditional knowledge, innovations and practices of local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are being respected, integrated and reflected in the implementation of the NBSAP with their full and effective participation at all relevant levels.
	Target 17: By 2020, science, technology and innovation relating to biodiversity, its values, functioning, status and trends and the consequences of its loss have been strengthened, improved, widely shared, transferred and applied.
	Target 18: By 2020, mechanisms for resource mobilization and accounting have been established and financial resources from national budgets and other sources for the implementation of the NBSAP increased from current levels.

5. MAINSTREAMING BIODIVERSITY

Stakeholders have been slow to take up mainstreaming of biodiversity into other sectors and national development planning processes. However, the increasing threat of climate change has given greater impetus for all sectors to adopt measures that will help in coping and mitigation. Such measures will ultimately benefit the conservation of biological diversity. Generally, Zimbabwe's policy and legislative environment has been supportive of biodiversity conservation as most sectors subscribe to the principle of sustainable development.

Section 73 of the Constitution of 2013 enshrines the right of people to an environment that is not harmful to their health or well-being and that is protected for the benefit of present and future generations through laws and measures that "prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting economic and social development".

ZimAsset, the economic and social development blueprint to guide Zimbabwe's development for the next five years, underscores the need to address multiple environmental management challenges such as pollution, poaching, deforestation, land degradation, veld fires and biodiversity loss. The government has encouraged stakeholders to take measures to address these challenges by implementing appropriate policies and strategies.

In addition to these overarching macro level policies, sectors have developed and implemented policies and strategies to integrate environmental concerns since 2010. Table 14 in Appendix B shows national policies, strategies and commitments related to biodiversity and environmental issues.

5.1 Other sector biodiversity mainstreaming initiatives

5.1.1 Environment sector

In 2012, the EMA developed guidelines to assist local authorities to develop local environmental action plans to engender community participation and, when implemented, to enhance the conservation and sustainable use of the natural resources as required by the United Nations Convention to Combat Desertification. In 2013, it developed draft model by-laws on environment and natural resources conservation for adoption by rural district and urban councils. The by-laws will contain measures aimed at regulating and controlling the indiscriminate cutting of trees, burning of vegetation, invasive alien species, protection of wetlands and water courses, air pollution, solid and effluent waste management, genetic resources, hazardous substances and toxic chemicals, among others.

Although Zimbabwe has yet to ratify the Nagoya Protocol on access and benefit sharing (ABS), some progress has been made to operationalize Statutory Instruments 61 of 2009 on ABS. This has been achieved through cooperation with the Zimbabwe Intellectual Property Office, which has been active in awareness creation on ABS and formulating an informed prior consent framework for Zimbabwe.

5.1.2 Forestry sector

In an effort to curb deforestation and conserve biodiversity, the Forestry Commission developed Statutory Instrument 116 of 2012 in accordance with sections 65 and 89 of the Forest Act (Chapter 19:05). The regulations came into effect in July 2012. Their purpose is to control the exploitation of firewood and timber in line with the following provisions:

- Only licensed persons can trade in timber and firewood;
- Only farmers with flue- or flame-curing firewood licences shall use or transport firewood for curing;
- Forestry Commission permits are needed to transport or export more than 0.5 cubic metres of firewood or timber;
- The Forestry Commission has introduced programmes to control invasive alien pest species, namely the blue gum chalcid (*Leptocybe invasa*) and the bronze bug (*Thaumastocoris peregrinus*).

Research on the growth of eucalyptus tree varieties that are resilient in the face of climate change is conducted regularly. The Forestry Commission also monitors the impact of veld fires on forestry estates.

5.1.3 Mining sector

Unsustainable mining practices and the use of heavy metals such as mercury have contributed to water contamination and poisoning of wildlife and livestock, according to the EMA annual report of 2010. The Ministry of Mines and Mining Development developed a five-year strategic plan (2011-2015) in which it proposes to educate small-scale miners about ways to mitigate environmental damage as well as conducting nationwide monthly mine visits and mine audits, with penalties for non-compliant miners (MEWC 2013).

6. PROGRESS TOWARDS THE 2020 AICHI BIODIVERSITY TARGETS AND CONTRIBUTIONS TO THE RELEVANT 2015 TARGETS OF THE MILLENNIUM DEVELOPMENT GOALS

Most of the global Aichi Biodiversity Targets are relevant to biodiversity management in Zimbabwe. Table 15 in Appendix C shows the six prioritized targets critical to improving biodiversity management in Zimbabwe and the relevant national targets.

The summary review of progress toward implementing the CBD strategy provided here is confined to priority biodiversity issues identified during the NBSAP 2 development process (Table 16 in the Appendix). Progress has been good in terms of formulation of sector policies, strategies and identification of actions. Implementation has been inadequate, however, because of the lack of financial resources, limited technical skills, compromise for the sake of accelerated economic development (such as partial adherence to EIA policy) and other reasons.

A qualitative assessment was made of the progress toward the national targets focused on the six priority areas (Table 17 in Appendix C).

The biodiversity sector has an intricate relationship with the socio-economic sector, playing a somewhat enabling role. Well-conserved biodiversity offers greater economic benefits and promotes positive social and cultural development. Zimbabwe has had mixed results in terms of biodiversity conservation, doing well in wildlife conservation on private land holdings, for instance, but doing badly with respect to poaching in state-protected areas. The sector's contribution to achieving the MDGs is mainly positive, but to a limited extent. Table 18 summarizes the contribution of the biodiversity sector toward realisation of the MDGs.

Table 15: Relevant national and Aichi Biodiversity Targets for prioritized biodiversity issues

Priority biodiversity issue	National target
1. Land use and land-use systems	2,3,5,10,13,11,12 and 16
2. Biodiversity and business	4,6,11,14 and 16
3. Coordination in policy implementation	14,15 and 16
4. Mainstreaming biodiversity into planning processes	1,2,3,5,9 and 16
5. Innovative biodiversity financing	18
6. Research and development	17

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APPENDIX A: REVIEW OF PROGRESS IN IMPLEMENTING THE 2000 NBSAP

Strategy 1: Develop comprehensive and elaborate biodiversity inventory and monitoring programmes for all species of flora and fauna, including micro-organisms

- BirdLife Zimbabwe has identified and mapped Important Bird Areas and undertakes regular monitoring of bird populations and assessments of habitats;
- The Zimbabwe Parks and Wildlife Management Authority collaborated with national, regional and international scientific and academic institutions to conduct research and wildlife and animal surveys in protected areas, notably Hwange and Gonarezhou national parks, and crocodile counts in the Runde and Save rivers;
- Ongoing monitoring of lion, wild dog and elephant populations with financial support from the private and NGO sectors;
- Re-assessment of habitats and endemic plant species in protected areas in the Eastern Highlands in 2012 by the National Herbarium and Botanic Gardens;
- Forestry Commission monitoring of invasive alien species in Eastern Highlands plantations;
- Man and the Biosphere (MAB) monitoring programme, resulting in the designation of the Mid-Zambezi biosphere reserve;
- Monitoring of wetlands by NGOs and EMA, resulting in designation of RAMSAR sites.

Strategy 2: Create incentives and opportunities for biodiversity conservation

- A statutory instrument on access to genetic resources was formulated in 2011 and a draft policy on intellectual property is being formulated;
- Acceptance of the principles of equitable access and benefit sharing has been enshrined in the Constitution and the Indigenisation and Economic Empowerment Act. This has led to the creation of community share ownership trusts in the mining sector;
- Wildlife-based and forest-based land reform programmes have provided the basis for indigenous communities to engage in enterprises that have created community game ranches, and commercial communal conservancies;
- Local-level participatory institutions for natural resource management have been formed, such as community-based enterprises for beneficiation of natural resources, river catchment management councils, wildlife committees, environmental sub-committees and fire management committees.

Strategy 3: Develop and implement a clear, definite and co-ordinated national policy and legislative framework for environmental awareness, education and training

- The EMA has developed environmental profiles and databases and a framework for integrated and comprehensive environmental information systems has been put in place;
- Although no clear policy on environmental awareness, education and training is in place, some organizations have taken the initiative to strengthen environmental education. An example is a project of the Institute of Environmental Studies to mainstream sustainable natural resources management in professional agricultural training;
- Most tertiary institutions have introduced undergraduate and post-graduate courses in environment and natural resource management;
- Zimbabwe's education curricula at both primary and secondary levels have incorporated environment aspects.

Strategy 4: Strengthen and coordinate biodiversity initiatives at various levels

- Enhanced conservation farming efforts by Agritex (the government's agricultural extension service) and NGOs as a drought-coping strategy;
- Programmes on promotion of small grains and legumes such as a Food and Agriculture Organisation (FAO) project to promote production, processing and marketing of small grains in marginal areas, the MWEC's Coping with Drought project and the seed multiplication pilot project of the Ministry of Women Affairs, Gender And Community Development;
- Some district councils have developed local environment action plans and natural resource management plans that include land use systems to enhance biodiversity conservation;
- The EMA has developed model by-laws for local authorities to promote sustainable management of natural resources.

Strategy 5: Strengthen and harmonize relevant legislation that has implications on biodiversity conservation and maximize synergies across sectors.

- **The national water policy of 2013 incorporates overall environmental protection and pledges the provision of adequate quantities and quality of water for wetland ecosystems and wildlife;**
- **Integrated environmental concerns that promote biodiversity conservation are incorporated in the national energy policy of 2012, the comprehensive agricultural policy framework, the Ministry of Mining and Mining Development's five-year strategy plan (2011-2015) and several statutory instruments, including SI 116 of 2012 on commercial exploitation of forest-based products and SI 61 of 2009 on access to genetic resources and indigenous resource-based knowledge;**
- **A national environmental council comprising permanent secretaries of relevant ministries, academics and representatives from civil society and industry has been set up to provide impetus for improved harmonisation of policies and conservation efforts.**

Strategy 6: Develop and operationalize a comprehensive national policy on biodiversity

- **There is no dedicated biodiversity policy in the country;**
- **Biosafety guidelines with biosafety measures, protocols and code of conduct have been incorporated in the National Biotechnology Act of 2006;**
- **A draft policy on intellectual property has been developed and is under review;**
- **Capacity development for biodiversity conservation is mainstreamed through on-the-job and post-graduate training in most relevant sectors.**

Strategy 7: Provide a sustainable and readily accessible financial base and institutional capacity to assist biodiversity projects at the local level

- **Zimbabwe received an indicative allocation of $1.72 million for biodiversity, $2 million for climate change and $2.87 million for mitigation of land degradation from the GEF. By 2012, $55,000 had been utilized in biodiversity, $33,000 in climate change and $88,000 in land degradation mitigation activities;**
- **Zimbabwe collaborated with the World Bank to develop the Hwange-Sanyati biological corridor project, which is being implemented;**
- **A carbon tax and environment fund are in place; however, there is a need for transparent mechanisms for accessing the funds for biodiversity conservation.**

Strategy 8: Facilitate the development of affordable, viable and acceptable alternatives for human survival beyond the existing natural resource base

The government has taken heed of the negative impact of unsustainable exploitation of natural resources and has developed policies and strategies that offer alternative livelihoods beyond agriculture. Examples are the development of sustainable artisanal mining and small-scale enterprises and community-based ecotourism enterprises focusing on non-timber forest products.

Strategy 9: Develop and implement appropriate research and extension approaches in biodiversity conservation and sustainable use

- **Fragmented research and biodiversity monitoring through various public and civic society institution have not been integrated to provide information that can be applied in national planning. Research and extension approaches still need to be harmonized to promote biodiversity conservation and sustainable use;**
- **Zimbabwe has successfully applied participatory methodologies in research and extension, with notable examples being the FAO-supported conservation agriculture programme, Centre for Applied Social Sciences and scenario planning approach, the EMA's local environment action planning facility and the World Wildlife Fund's wood energy assessments.**

APPENDIX B: POLICIES, STRATEGIES AND COMMITMENTS

Table 14: National policies, strategies and commitments related to biodiversity and environmental issues

POLICY AND ITS GOAL	OBJECTIVES (especially addressing environmental issues)	STRATEGIES (especially addressing environmental issues)
NATIONAL ENVIRONMENTAL POLICY AND STRATEGIES (2009)	Avoid irreversible environmental damage, maintain essential environmental processes and preserve the broad spectrum of biological diversity to sustain the long-term ability of natural resources to meet basic human needs, enhance food security, reduce poverty and improve living standards of Zimbabweans through long-term economic growth and job creation	– Integrate environment in all development policies, programmes and management plans – Have in place a sound environmental information system – Enable human resource and technical capacity development to identify, assess, evaluate and respond to the possible impacts of development on environmental structure and functioning – Research and monitoring to assess the effectiveness of measures implemented
NATIONAL ENERGY POLICY	Promote the optimal supply and use of energy for socio-economic development in a safe, sustainable and environmentally friendly manner	– Observe environmental regulations in all power-sector projects – Ensure environmentally friendly exploitation methods – Increase use of and investment in renewable energy – Develop incentives for investment in renewable energy, such as subsidies and tax concessions – Support the Forestry Commission to increase the tree-planting rate from 10 million to 20 million trees per year by 2015 and to promote rural fencing using live trees – Support end-user-focused research, and awareness and education programmes, to increase the efficiency of fuelwood use – Improve collaboration with stakeholders to enforce existing and proposed regulations to prevent the destruction of natural forests, for instance requiring tobacco growers who make heavy use of fuelwood to establish woodlots, and levying penalties for the unauthorised cutting of trees – Promote the use of alternative heating and cooking fuels such as coal, solar power and biogas in rural households and institutions such as boarding schools and hospitals, and in rural commercial applications such as bakeries, brick moulding and tobacco curing
NATIONAL POPULATION POLICY (October 1998) – Create enabling conditions for sustainable use of natural resources and growth in tourism – Sustainable use of resources and their preservation for future generations	– Increase awareness of sustainable development, conservation of natural resources and environmental management – Ensure sound management of natural resources and the environment to promote sustainable use natural resources	– Enforce regulations that ensure proper use of natural resources – Enhance community participation in the sustainable use of natural resources – Advocate for changes in the land tenure system and intensify sound land-use plans in order to curb environmental problems – Develop a national water policy and promote proper management of water resources – Enhance sound management of forests, veld, wildlife and protected areas – Intensify awareness campaigns on management of agricultural chemicals, energy production and use, air pollution, noise pollution and working environments – Advocate for alternative sources of energy to reduce dependence on wood for fuel – Make environmental impact assessment mandatory for any project before it is approved – Introduce integrated environmental and natural resources management – Educate Zimbabweans about the need to conserve the environment and involve them in its management – Avoid overusing resources and ensure that future generations also enjoy the benefits of the available natural resources

Table 14: National policies, strategies and commitments related to biodiversity and environmental issues (cont.)

POLICY AND ITS GOAL	OBJECTIVES (especially addressing environmental issues)	STRATEGIES (especially addressing environmental issues)
ZIMBABWE NATIONAL CLIMATE CHANGE RESPONSE STRATEGY (Draft) Mainstream climate change adaptation and mitigation strategies in economic and social development at national and sectoral levels through multi-stakeholder engagement	– Mainstream climate change in all key sectors of the economy – Promote resource use efficiency and less carbon-intensive pathways in all economic activities and develop an energy infrastructure that is resilient and not carbon-intensive – Develop climate-proofed and environmentally sustainable transport systems that are less carbon-intensive – Promote sustainable development, management and use of water resources under changing climate conditions – Promote sustainable land-use systems that enhance agricultural production, ensure food security and maintain ecosystem integrity – Develop nationally appropriate mitigation actions as a step towards low-carbon development strategies – Address climate change through evidence-based research, technology development and transfer – Promote and protect health under a changing climate – Develop an effective climate change communication and information management system that facilitates access by all stakeholder groups – Strengthen and mainstream climate change in all education curricula – Mainstream gender, HIV and AIDS and other vulnerable groups into all climate change interventions – Develop and maintain an appropriate climate governance framework and institutional mechanisms aimed at coordinating climate change responses	Sector-specific (natural systems, economic, physical and social infrastructure) strategies identified
LAND REFORM POLICY (The integrated conservation plan for the fast-track land reform programme)	Impart environmental awareness and develop a culture of resource management in resettled areas	– Integrated land use planning for new schemes in preparation for resettlement – Promote micro-catchments management, including woodland management – Collect baseline information for natural resources inventory maps for monitoring – Form conservation committees – Agro-forestry in newly settled areas – Take advantage of economic and ecological attributes of wildlife production in parts of the country prone to drought – Provide financial resources and technical support for constructing conservation works and rehabilitating degraded areas
WILDLIFE-BASED LAND REFORM POLICY	Maximize livelihood options for resettled farmers, particularly in areas where crop production has limited potential, by ensuring profitable, equitable and sustainable use of wildlife and other resources	– Ensure more equitable access by Zimbabweans to land and wildlife resources and to the business opportunities that stem from these resources; – Maintain a proportion of land outside protected areas under wildlife production – Promote a diversity of land uses through wildlife production and develop and implement appropriate institutional arrangements from wildlife-based land reform

Table 14: National policies, strategies and commitments related to biodiversity and environmental issues (cont.)

POLICY AND ITS GOAL	OBJECTIVES (especially addressing environmental issues)	STRATEGIES (especially addressing environmental issues)
ZIMBABWE NATIONAL GENDER POLICY (2013-2017) Eradicate gender discrimination and inequalities in all spheres of life and development	Increase gender responsiveness of environmental and natural resources management strategies and in climate change adaptation and mitigation initiatives	– Conduct a review of current environment and natural resources management policies and strategies and audit for gender considerations, identify gaps, recommend advocate for the incorporation of gender perspectives – Support initiatives that aim to actualise the constitutional environmental rights – Conduct research to collect gender segregated data that highlight environment challenges and climate change induced inequalities among women and men, and recommend gender responsive strategies – Build the capacity of state and non-state development agencies in gender mainstreaming in environment and climate change policies, programmes and national environmental action plans – Contribute to the development and regular reviews of the National Climate Change Policy and Response Strategy, the National Biodiversity Strategy and other related national strategies ensuring they adequately incorporate gender considerations – Support interventions aimed at increased participation of both females and males in the sustainable utilisation of natural resources for economic benefits including opportunities for carbon trading – Ensure national level strategies for climate induced disaster management and risk reduction and coping mechanisms are gender responsive
WATER RESOURCES POLICY & STRATEGY (2013)	Promote the sustainable, efficient and integrated utilization of water resources for the benefit of all Zimbabweans	– Promote equal access to water for all – Promote stakeholder participation and involvement in decision making for water sector – Promote integrates approach to land and water management – Promote the utilization of water resources in an economically efficient manner – Put in place strategies that will promote the production of accurate water data on water use and demand for both surface and ground water – Promote private sector financing in water sector as well as improve opportunities for self financing and amelioration of public sector financing – Promote integration of sector and regional water policies

Table 14: National policies, strategies and commitments related to biodiversity and environmental issues (cont.)

POLICY AND ITS GOAL	OBJECTIVES (especially addressing environmental issues)	STRATEGIES (especially addressing environmental issues)
ZimAsset 2013-2018	Achieve sustainable development and social equity anchored in indigenization, empowerment and employment creation, which will be largely driven by the judicious exploitation Zimbabwe's abundant human and natural resources	– Improve agricultural infrastructure to mitigate against drought through rehabilitation and expansion of irrigation projects and increased construction of dams – Enact legislation to effectively manage the environment – Formulate a national climate change policy – Enhance the capacity of the ZNPWA to combat poaching – Institute methods to increase wildlife species, flora and fauna – Update reports of the ecosystem and its preservation
NATIONAL TRANSPORT POLICY	– Road transport and environment: promote environmentally friendly modes of transport – Air transport and environment: minimize the impact of air transport on the environment – Railway transport and environment: minimize the adverse impact of railway transport on the environment – Inland water transport and environment: minimize the harmful effects of the inland water transport system on the environment and promote the conservation of energy	Not specified
ZIMBABWE MINERALS POLICY (DRAFT MARCH 2013) Equitable and optimal exploitation of Zimbabwe's mineral resources to underpin broad-based sustainable growth and socio-economic development	A sustainable and well-governed mining sector that effectively garners and deploys resource rents and that is safe, healthy, ethnically and gender-inclusive, environmentally friendly, socially responsible and appreciated by surrounding communities	– Enhance the participation of indigenous Zimbabweans in mining and related linkage industries and facilitate equitable access to the sector by all Zimbabweans with the requisite capabilities, irrespective of gender or ethnicity – Minimise adverse social conditions and environmental degradation due to mining activities and enhance the health and safety regime for workers in the industry – Support sustainable artisanal and small-scale mining activities to create employment, generate income and help reduce poverty in the rural areas – Ensure consultation among all stakeholders and affected communities about exploration, mining and the aftermath of mine closures – Establish effective administration and management of the mineral sector – Ensure significant mineral operations are permitted only when an environment and social impact assessment has been conducted, evaluated and approved by the government; plans for managing environmental and social impacts must be incorporated into the assessment reports

APPENDIX C: PROGRESS TOWARDS THE 2020 AICHI BIODIVERSITY TARGETS AND 2010 MILLENNIUM DEVELOPMENT GOALS

Table 16: Progress in implementing the CBD Strategic Plan 2011-2020

AGRICULTURE BIODIVERSITY: National target 11; relevant global target 13		
National implementation activities or actions taken	**Contributions to achieving global targets and activities**	**National outcomes**
Research into new varieties of crops	Establishment of gene bank	Food security enhanced
Conservation in the form of semen and embryo transfer is being done on a limited scale at Matopos and Makoholi research stations		Increase in crop and animal biodiversity
Conserving nucleus herds and flocks of indigenous breeds in order to preserve the genetic resource		
– Promotion of drought-resistant crops (small grains programme) – Promotion of organic farming through the organic farmer network and promotion of conservation agriculture in partnership with Food and Agriculture Organization		Increase in cultivation of indigenous crop varieties
BIODIVERSITY OF PROTECTED AREAS AND INLAND WATERS: National targets 4, 7, 9 and 10; relevant global targets 6,9,11 and 12		
– Bio-economic survey of Lake Kariba in 2012 – Reduction in fishing quotas – Lake Kariba joint management plan between Zambia and Zimbabwe	– Recovery of fish stocks – Sustainable fisheries	– Fisheries co-management structures in place – Enhanced integrated management plans for catchment and lake basins
– Research into the African wild dog population and proposals to list it as an endangered species – Private sector and state partnerships on rhino protection – Designation of biosphere reserves, world heritage sites and wetlands as RAMSAR sites	– Extinction of valuable species prevented and conservation status improved. – Increase in coverage of area under protection (i.e. increased global protected area network)	Public-private partnerships in wildlife management strengthened
– Intensification of anti-poaching activities – Park management plans – Control of invasive alien species in aquatic ecosystems and plantation forests	– Sustainable management practices – Preventing and managing biological invasions of endemic species	Increased awareness of potential loss to productivity from vital ecosystems

Table 16: Progress in implementing the CBD Strategic Plan 2011-2020 (cont.)

FOREST BIODIVERSITY: National targets 3, 5, 8 and 10; global targets 5,7,10 and 12		
National implementation activities or actions taken	**Contributions to achieving global targets and activities**	**National outcomes**
Statutory Instrument 116 of 2012, which controls deforestation in newly resettled areas	Minimizing loss and fragmentation of natural habitats and protection of forest resources	Limited enforcement because forestry officers lack arresting powers
– Promoting propagation and distribution of indigenous trees – Reforestation programmes intensified with national annual targets – Promoting agroforestry as part of conservation agriculture – Friends of the Environment tree for life programme through Nyaradzo Funeral Services	Maintenance of indigenous tree species	Increased awareness of the importance of trees for sustainable livelihoods
National fire management strategy and protected forest area management plans	Protection of forest ecosystems and non- timber resources	
– Mainstreaming of climate change issues with REDD+ projects in four districts – Community satellite nurseries and nurseries at household level		Increased stakeholder participation in climate change mitigation
TERRESTRIAL AND MOUNTAIN BIODIVERSITY: **National targets 1, 3, 5, 7, 9, 12 and 13; global targets 1, 5 ,7,9,11, 14 and 15**		
Local environmental action plans	Rehabilitation of degraded land to minimize biodiversity loss	Increased participation of stakeholders in environmental management initiatives
Media tours and awareness programmes for local authorities and parliamentarians	Increasing awareness of biodiversity values	
Plan to make environmental accounting a listing requirement on the Zimbabwe Stock Exchange as part of self-regulation	Research and quantification of economic benefits from biodiversity conservation	
Monitoring and control of pathways and invasive species	Research into methods of eliminating invasive alien species	Control and management of invasive alien species to maintain ecosystem integrity
Sustainable land management plans	Park management plans, forest management plans and local environmental plans	Maintenance of protected area ecosystems

Table 17: National progress in implementing the Aichi Biodiversity Targets
A - achieved, PA - partly achieved and NA - not achieved

GLOBAL AICHI TARGET	RELEVANT NATIONAL TARGET Narration	A	PA	NA	Remarks to support rating
LAND USE AND LAND-USE SYSTEMS					
Target 2	By 2020, biodiversity is mainstreamed into all sectors and incorporated into national accounting and reporting systems		**X**		– Mainstreaming in national plans achieved in such areas as small grains policy, environmental impact assessments, NEP, renewable energy, climate change, food security policy – Challenge of incorporating biodiversity into national accounting – Economic valuation of ecosystems is a new concept and has not been done at a national level
Target 5	By 2020, the rate of loss of natural habitats, including forests, is reduced by at least 50%			**X**	– Increased stress on natural resources – Unsustainable mining operations – Limited livelihood options – Lack of environmental awareness – Excessive economic dependence on natural resources – Rapid urbanization
Target 7	By 2020, areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity and sustainable land use		**X**		– Conservation farming practices increasing countrywide – EMA to establish fire-fighting teams at community level – Increased partnerships between Forestry Commission and private sector – Aquaculture policy being developed – Increased community participation in afforestation and reforestation programmes – Adoption of a statutory instrument on all types of forests (not legally binding) – Improved environmental institutional arrangements in place at local level – Challenge of resuscitating inland waters – Sustainably manage inland waters to increase production and reduce pollution
Target 12	By 2020, having prevented the loss of threatened species and improved and sustained their conservation status, particularly of those most in decline		**X**		– Unsustainable mining operations – Limited livelihood options lead to overexploitation of threatened species – Lack of environmental awareness – Land use changes
Target 13	By 2020, having developed and implemented strategies to conserve and maintain cultivated, farmed and domesticated genetic resources and their wild relatives, including other socio-economically and culturally valuable species		**X**		*Ex situ* conservation of cultivated plants and their wild relatives as a way of preserving genetic diversity
Target 14	By 2020 having implemented policies and strategies to maintain and restore ecosystem integrity and reduce ecosystems degradation in order to enhance the livelihoods and well-being of all Zimbabweans, especially those of women, indigenous and local communities, and the poor and vulnerable		**X**		– Council on traditional medicine has been established – Integrated natural resource management planning incorporated in land, water, health and mining. However, there is need for implementation – EMA is building capacity for local authorities to undertake environment action planning – Gender policy promotes the need for decent livelihoods of the poor and vulnerable, especially women
Target 15	By 2020, combating desertification and enhancing ecosystem resilience through conservation and restoration of degraded ecosystems		**X**		Restoration of degraded ecosystems: Monavale Vlei declared a RAMSAR site; reclamation of Dzimbahwe gully in Mashonaland and Chireya gully in Gokwe; and eradication of invasive cactus rosea in Gwanda and Beitbridge
Target 18	By 2020, having fully integrated traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity with national policies, with full and effective participation of indigenous and local communities , for instance in community conserved areas and seed bank projects		**X**		– Traditional knowledge systems in Southern African Development Conference – EMA is encouraging traditional leaders to actively promote the protection of forests (ZIPO, ARIPO) – Integration of traditional knowledge systems in agriculture and forestry – Community ownership trusts in the mining and wildlife sectors

Table 17: National progress in implementing the Aichi Biodiversity Targets (cont.)
A - achieved, PA - partly achieved and NA - not achieved

GLOBAL AICHI TARGET	RELEVANT NATIONAL TARGET Narration	A	PA	NA	Remarks to support rating
BIODIVERSITY AND BUSINESS					
Target 4	Not yet elaborated		**X**		– National cleaner production centre – Council on sustainable development – Strategic plan of Ministry of Lands 2014 recognizes security of tenure – Tobacco and wood energy programme Statutory Instrument 116 provides incentives for tobacco farmers to develop their own woodlots for curing, reducing pressure on indigenous forests – Companies implementing environmental management plans as part of ongoing efforts for cleaner production and in fulfilment of environmental impact assessments
Target 6	By 2020, ecosystem-based approaches to aquatic resources management being applied on Lake Kariba and other water bodies to avoid overfishing, enabling recovery of fish stocks and reducing loss of indigenous species		**X**		– Aquatic fish and plant harvests for Lake Kariba documented – Nets are regulated for registered fishermen – Bilateral agreement on water body usage in place between Zimbabwe and Zambia
Target 8	By 2020, integrated pollution prevention and control strategies in place to reduce harm to ecosystem functioning and biodiversity		**X**		– Need for compliance by polluters – National air quality standards yet to be adopted
Target 13	BY 2020, strategies developed and implemented to conserve cultivated, farmed and domesticated genetic resources and their wild relatives, including other socio-economically and culturally valuable species		**X**		*Ex situ* conservation of cultivated plants and their wild relatives as a way of preserving genetic diversity
Targets 16 & 18	By 2015, Zimbabwe has acceded to and domesticated the Nagoya Protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their use		**X**		– Ratification of Statutory Instrument 61 ABS in progress – CYMMT-free access of crop germ plasm and crop varieties – Plant genetics treaty – Draft policy framework on access and benefit sharing
Target 3	By 2020, biodiversity mainstreamed into all sectors and incorporated into national accounting and reporting systems		**X**		– Tobacco sector: methyl bromide as pesticide banned – Increased availability of renewable energy technologies – Phasing out of ozone-depleting substances (Check with ozone office)
RESEARCH AND DEVELOPMENT					
Target 19	By 2020, science, technology and innovation relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss are strengthened, improved, widely shared, transferred and applied		**X**		Need for clearing house mechanism

Table 17: National progress in implementing the Aichi Biodiversity Targets (cont.)
A - achieved, PA - partly achieved and NA - not achieved

GLOBAL AICHI TARGET	RELEVANT NATIONAL TARGET Narration	A	PA	NA	– Remarks to support rating
POOR COORDINATION IN POLICY IMPLEMENTATION					
Target 17	By 2015, National Biodiversity Strategy and Action Plan developed, updated and adopted as a policy instrument, and implementation has commenced		**X**		– Participatory national budgeting process – Participatory review of NBSAP
Target 18	By 2020, traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity are fully integrated with national policies with the full and effective participation of indigenous and local communities		**X**		– Comprehensive study needed of indigenous knowledge systems application in different ecosystems – Study and documentation of plants of medicinal importance in Chimanimani, Chipinge and Bulilima Mangwe districts
MAINSTREAMING BIODIVERSITY INTO PLANNING PROCESSES					
Target 1	By 2020, at least 75% of the population are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably		**X**		– Limited livelihood options: biodiversity is a low priority – Environmental action planning at local level – Companies adopting environmental management plans as part of environmental impact assessment process – Incorporation of environmental issues in education curriculum at primary and secondary level – Faith-based organizations partnering with Environmental Management Agency to increase awareness – Alternative energy forms such as solar power and biogas are being used in some rural communities
Target 11	By 2020, at least 28% of Zimbabwe's terrestrial and inland water under protection is being maintained and conserved, and protected area connectivity enhanced through integrated resource management		**X**		– Mid- Zambezi biosphere reserve established – New RAMSAR sites designated – Integrated water resources management adopted in national water policy – New water policy in place
INNOVATIVE BIODIVERSITY FINANCING					
Target 20	By 2020, mechanisms for resource mobilization and accounting are established and financial resources from national budgets and other sources for the implementation of the NBSAP are increased		**X**		– Funding for updating NBSAP – Private-public partnerships in wildlife management established – Regional cooperation in wildlife monitoring – REDD + – Global Environmental Fund funding for medium-scale projects – Need for Increased funding for community-based organizations and local authorities

Table 18: Contribution of biodiversity sector toward achievement of the MDGs

MDG goals and target	Indicator	Biodiversity sector actions and initiatives
Goal 1 Target 1A	Percentage of people below the total consumption poverty line	Biodiversity conservation in protected areas has enhanced community livelihoods through the goods and services provided by ecosystems CAMPFIRE and other co-management arrangement with communities have improved living standards
Goal 1 Target 1B	Achieve full and productive and decent work for all, including women	The sector continues to employ the active population formally through the hospitality industry and informally through crafts, fisheries and commercial exploitation of non-timber products More women than men work in the hospitality industry
Goal 3: Promote gender equality and empower women	Increase the participation of women in all sectors at all levels	More women in natural resource management committees and in decision-making positions in community ownership trusts
Goals 4, 5: Reduce child mortality and improve maternal healthcare	Reduce the under-five mortality rate and increase access to reproductive health	New clinics have been built with proceeds from CAMPFIRE and mining royalties
Goal 6: Combating HIV & AIDS, malaria and other diseases; health-related issues	Halt and reverse incidence of malaria and other major diseases	Greater use of traditional medicinal plants in combating child mortality, improved maternal health, HIV&AIDS and malaria and nutrition
Goal 7 Target 7A	– Proportion of land covered by forest – Consumption of ozone-depleting substances	– The sector has programmes to increase land under forests, including tree-planting projects in schools, community nurseries and the national tree planting initiative – Hospitality sector is using ozone-free gadgets and products
Goal 7 Target 7B	– Proportion of fish stocks within safe limits – Proportion of terrestrial and marine areas – Proportion of species threatened with extinction	– Limited contribution due to threat of overfishing, but co-management arrangements are in place – Increased protected areas coverage through proclamation of new RAMSAR sites, expansion of conservancies and formation of Mid – Zambezi biosphere reserve – Domestication of related international conventions – Improved institutional arrangements for biodiversity conservation, including the national environmental council
Goal 7 Target 7C	Proportion of the population using an improved drinking water source	– Wetland protection – Water harvesting – Pollution control in aquatic systems
Goal 8: Global partnerships and development	Target C: develop and implement strategies for decent work Target E: In cooperation with the private sector, make available the benefits of new technologies	– Wildlife has provided alternative livelihoods to communities living in and around protected areas – Cleaner production technologies and renewable energy technologies adopted to reduce pollution and halt deforestation