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Ethiopia Biodiversity and Tropical Forests 118/119 Assessment

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CONTENTS

All photos BATS/Brian App

ACRONYMS

CSE	Conservation Strategy of Ethiopia
EIA	environmental impact assessment
ELTAP	Ethiopia Land Tenure and Administration Program
EPA	Environmental Protection Authority
EPE	Environmental Policy of Ethiopia
FDRE	Federal Democratic Republic of Ethiopia
FEWS Net	Famine Early Warning System Network
FPA	forest priority area
IBC	Institute of Biodiversity Conservation
IUCN	International Union for the Conservation of Nature
NBSAP	National Biodiversity Strategy Action Plan
NGO	nongovernmental organization
NTFP	Non-Timber Forest Products
PLI	Pastoralist Livelihoods Initiative
PSNP	Productive Safety Net Program
SNNPRS	Southern Nations, Nationalities, and Peoples Regional States
UNDP	United Nations Development Program
UNDP-GEF	United Nations Development Program—Global Environment Facility
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

With broad latitudinal and altitudinal ranges, Ethiopia encompasses an extraordinary number of ecological zones, which in turn host rare and endangered species and high rates of endemism. In combination with its importance as a center of genetic and agricultural diversity, the conservation of Ethiopia's biodiversity is an issue of global importance. With the second-largest population in Africa, limited capacity to manage natural resources, and widespread land degradation, however, Ethiopia also faces many serious challenges to efforts to conserve its biodiversity and forests.

For more than 20 years, natural resource institutions in Ethiopia have faced frequent restructuring, with the only relatively stable institution (since 1995) being the Environmental Protection Authority (EPA). These changes have presented challenges, as building stable relationships and long-term planning are critical to conservation efforts. For example, in recognition of the critical state and serious threats facing Ethiopian wildlife, the Ethiopian Wildlife Conservation Organization, previously a semi-autonomous organization under the Ministry of Agriculture and Rural Development, was reduced to a section under the Natural Resources department in 2005 and then regained its name and increased authority to oversee the wildlife in Ethiopia in June 2008. Although this most recent change may be positive in that it can help solidify national level wildlife planning, it is representative of the shifting of authorities that have plagued the sector in the recent past.

Species biodiversity in Ethiopia includes 280 mammals, 861 birds, 201 reptiles, and more than 6,000 plants[1] with high rates of endemism. According to the International Union for the Conservation of Nature's (IUCN's) 2007 "red list" of these species, Ethiopia has 6 that are critically endangered, 23 endangered, and 70 vulnerable. Nine national parks, 4 wildlife sanctuaries, 7 wildlife reserves, and 18 controlled-hunting areas have been established in Ethiopia to protect and conserve its valuable biodiversity assets. Of these, however, only two, Simien National Park and Awash National Park, have been officially gazetted. Protected areas in Ethiopia also have suffered from inadequate security, staffing, and equipment, leading to many cases where their status is little more than nominal and providing no protection for their fauna and flora.

Threats to Ethiopia's biodiversity, tropical forests, and resource base can be broadly linked to the following categories: limited governmental, institutional, and legal capacity; population growth; land degradation; weak management of protected areas; and deforestation. These threats are largely interrelated and self-reinforcing, and it is therefore important not only to understand the individual threats but also to examine them in a holistic fashion that recognizes their interrelation and can help to propose solutions to decrease the threats and mitigate their effects.

Limited governmental, institutional, and legal capacity. Although there is generally a good framework for natural resource management in Ethiopia, in practice there is only limited on-the-ground implementation and stakeholder participation for policies. The gap

[1] Statistics for groups of species recorded to date in Ethiopia (modified from earlier reports such as Jacobs and Schloeder 2001 and Institute of Biodiversity Conservation 2005).

between policy and implementation can be explained by multiple issues, including policies that are unclear or that conflict with one another and a lack of clear authority both between federal and regional authorities and between agencies at the same level. To address these threats, it is critical to raise government decision makers' awareness of the importance of natural resource policies to Ethiopia; facilitate dialogue among the government, civil society, and national and international organizations; and to closely examine and revise those policies requiring clarification or harmonization.

Population growth. Among the threats in Ethiopia, population growth is the one that most directly drives and exacerbates the effects of the others. With population growth estimated at more than 2.2 percent per year, and with 85 percent of the population relying on farming or herding for their livelihoods, population growth places greater pressure on the land and resources to provide for immediate human needs. To address this threat, family planning can help reduce family size and slow population growth, and efforts toward generating alternative livelihoods activities can give people options other than farming or herding that are less dependent on limited natural resources.

Land degradation. The primary cause of land degradation in the pastoralist regions visited by the assessment team is overgrazing of livestock, which in turn leads to soil erosion and siltation of water sources. Degraded land also allows invasive species to colonize or increase their presence in an area, further degrading its productive capacity. To address this threat in the pastoralist areas, the principal remedy involves reducing the immediate pressure of grazing to allow for recovery and growth of grasses. Examples include facilitating the marketing of livestock to convert livestock into cash, bank savings, or other assets; subsidizing intensive livestock operations in appropriate locations; and otherwise encouraging a shift from traditional systems which have seen significant growth in both human and animal populations. For invasive species, efforts should be made to eradicate (where possible) and control spread, particularly in areas sensitive to biodiversity and where people depend on grazing value for their livelihoods.

Weak management of protected areas. Representing 16 percent of the land area of Ethiopia, protected areas are critical habitats for the most endangered wildlife and biodiversity in the country. Despite being officially protected, these areas are generally marked by weak management capacity and continually degraded landscapes. Effective protection of these areas should be a priority for expenditure of donor conservation funds, and the preeminent need is to have them officially gazetted (only 2 of the 38 units in the system are currently gazetted). Other key actions include increased enforcement of rules and boundaries; environmental education; and efforts to strengthen the relationships among parks and communities, with emphasis on returning the benefits of the park to those communities.

Deforestation. With only a 4 percent forest cover and an estimated deforestation rate of 8 percent per year as of 2000 (World Resources Institute: Earth Trends: Forests, Grasslands, and Drylands 2003). loss of remaining natural forests is a significant threat driven by direct causes (such as the production of charcoal and timber) and indirect causes (such as lack of management capacity and population pressures). To help slow or reverse deforestation in Ethiopia, it is important to raise the value of standing forests to people, show the benefits of

sustainable timber harvest, and provide people with alternatives for high levels of forest product consumption. To this end, efforts to extend tenure or use rights to forest areas (thereby encouraging the sustainable use and management of forest resources) as well as encouraging individual or community wood plots (to provide wood products and thereby reduce pressure on natural forests) should be supported. These efforts, however, should operate in tandem with environmental education to demonstrate the ecosystem and social value of forests. There are currently USAID and EU programs working separately on land tenure reform, forest management, and marketing of non-timber forest products. Coordinating these efforts could reinforce the goals of both and increase their impacts.

USAID/Ethiopia has a diverse portfolio, all of whose elements have the potential to affect conservation activities in the country. Although USAID programming is currently undertaking some actions for conservation, there remain numerous opportunities for further integration of and synergy between environmental goals and USAID's functional objective programming categories.

Peace and security. Working (or continuing to work) in volatile areas that are simultaneously important for biodiversity, such as Gambella and the Southern States, can help protect valuable resources threatened by conflict. Additionally, helping to clarify land use rights can reduce conflict while benefiting conservation by decreasing the potential for refugees and increasing incentives for natural resource management.

Governing justly and democratically. USAID's current work to improve the rule of law may benefit conservation by increasing enforcement of natural resource laws; in addition, work for good governance can help regional and local governments to be more responsive to the needs of communities, which often involves maintaining a healthy and productive resource base. Similarly, by strengthening civil society, the capacity of communities to organize and address their needs is improved; through Ethiopia Land Tenure and Administration Program (ELTAP), USAID has been addressing the issue of land tenure and has been successful in improving the rights of people over agricultural land.

In strengthening civil society organizations, it is recommended that USAID focus on groups involved in natural resource issues, such as community-based organizations established under the European Union forestry project in the southwest, and those around important protected areas such as the Simien or Bale Mountains National Parks. For programs strengthening the rule of law, USAID should support efforts to clarify natural resource policies, strengthen enforcement of protected area policies, and clarify the roles and relationships of federal and regional authorities in managing national parks. Finally, work in governing justly should continue to address the issues of land tenure—as is being done with ELTAP—to strengthen the application of tenure reforms to include use for forest and grazing lands.

Investing in people. The most important connection to conservation with USAID's current work in this objective is family planning—which can reduce the threat of population growth, which in turn drives many of the other threats. Programs aimed at protecting food security and vulnerable populations can aid conservation efforts by reducing pressure on natural resources at precisely the time they may be most vulnerable, such as when

grasslands are stressed because of drought. For education programs, USAID could further help to ensure that the environment is addressed through basic education; emphasize the links between the environment, health, and the economy; and support local environment clubs and student visits to protected areas to see wildlife. Additionally, when USAID builds health centers or works with communities on health or education issues, priority should be given to important biodiversity areas such as protected areas with endangered wildlife.

Economic growth. Economic growth is the objective that most directly affects the environment; as such, this was the focus of the assessment team. Through work in improving the productivity of agriculture, USAID programs help decrease low-yield extensive agriculture and herding, strengthen farm enterprises and value chains, provide alternative livelihood options, and help to reduce the number and impact of agriculturalists and pastoralists who depend directly on the land. USAID also works directly in soil and water conservation, eradication of invasive species, and the management and improvement of pasture land. With a planned ecotourism program, USAID can generate tourism revenues for conservation and communities in areas important to biodiversity.

To increase linkages with conservation through programs such as the Agribusiness and Trade Expansion Program and the anticipated Microfinance to Markets programs, USAID should consider supporting non-timber forest products such as honey, forest coffee, spices, and medicinal plants. Additionally where working on soil and water conservation with the Productive Safety Net Program, USAID should continue to address concerns (principally high seedling mortality) and conduct careful review processes to ensure effectiveness and efficiency.

For continued work with the Pastoralist Livelihoods Initiative (PLI) program, the varied approaches utilized in the current phase should be reviewed and narrowed to emphasize those that have been most successful and are most compatible with conservation goals. For example, rehabilitation of traditional water points—rather than construction of modern water points—can reduce localized degradation and reduce the impact of grazing by encouraging use of underutilized areas, and facilitation of cattle marketing can help reduce the number on the land while maintaining their value to owners (by converting the cattle to bank wealth). Additionally, efforts at improving range management and controlling or eliminating invasive species should be scaled up. In the case of *Prosopis juliflora*, alternate mechanical or chemical methods should be considered to help control or eradicate populations of the species. Alternatively, this species could be managed for marketability, as the wood has high value and multiple uses.

With the development of an ecotourism program, USAID can aid the conservation of biodiversity and forests in Ethiopia while generating rural incomes in surrounding communities. For this effort to be successful, however, it is critical to ensure that economic returns to local communities at least compensate for forgone benefits and be linked to conservation (principally through employment in or direct payment from tourism and wildlife). Furthermore, USAID should support new initiatives such as the Ethiopian Forum for Community-Based Tourism and help to enact management plans that already have been prepared but that lack implementation funds (such as the plan in Bale Mountains National

Park), which could offer the opportunity for quick impact and leveraging of private and other donor funds in support of ecotourism development goals.

In addition, it is necessary to protect and improve wildlife and flora populations through positive engagement with the local communities and support for the enforcement of laws in protected area tourist destinations so tourists are attracted in the first place. Infrastructure investments also should be supported, whether through funding or facilitation of privatization of facilities (lodges and concessions) so the sites will appeal to high-end tourists, which can generate significant economic returns for the activity.

During field visits in the southeast, the assessment team had the opportunity to evaluate ecotourism potential in that area. Although the USAID program is open to the entire country, with areas to be defined by the design team, we found evidence to recommend the further examination of the region as one of the potential areas for an ecotourism intervention. The southeast has high-value ecotourism assets, such as endemic mammal species (the Ethiopian wolf and the mountain nyala), other attractive species (oryx, kudu, and lions), numerous endemic bird species, and dramatic landscapes. If chosen as an ecotourism site, links should be developed to other regions that have more developed tourism and attractive natural assets, including the north (with historical and religious sites) and the southwest (with indigenous culture and people, wildlife, and potential forest coffee tourism).

Humanitarian assistance. USAID efforts in this area help to reduce pressure on the resource base in times of crisis and increase the capacity of the United States and the government of Ethiopia to respond to crises. Because these programs are not always well integrated, it is recommended that the modeling and analysis efforts of programs such as Famine Early Warning System Network (FEWS Net) be more broadly publicized and made available to on-the-ground organizations such as Pastoralist Livelihoods Initiative, which can use the information to plan and implement activities in the most critical areas.

Of the many threats and actions described in this report, the following three points may best distill the most critical challenges facing the conservation of biodiversity and forests in the country.

- **Without clear tenure—ownership and/or use rights—land degradation will likely continue.** Whether granted in the form of ownership or guaranteed rights of use and exclusion, land rights are critical to motivate people to use the resource base sustainably rather than over-utilizing it for short-term gains. Privatization of land is a sensitive issue in Ethiopia, but current trends of granting increasing use rights have received positive feedback. These trends, however, still need to be supported, and land rights need to be expanded to include grazing and forest areas if they are to remain viable for conservation and sustainable resource use.

- **With the dependence of Ethiopia on natural resources, conservation must be a top government commitment.** With an estimated 85 percent of the population dependent directly on the land for their livelihoods and with increasing trends toward and acknowledgement of land degradation in Ethiopia, it is critical that

conservation become a top commitment of the government of Ethiopia. Although there is an extensive and progressive framework of policies and agencies, management of natural resources is continually hampered by unclear and contradictory policies, a lack of clear authority between regional and federal bodies, and poor enforcement. With the firm commitment of the government, these issues can be addressed; however, as long as people feel that policies are on paper only, they will never realize their objectives. With the recent re-elevation of the Wildlife Conservation Organization to an autonomous authority under the Ministry of Tourism and Culture, the federal government has shown signs of taking conservation more seriously. This development must be supported if degradation of the land and biological systems is to be reversed.

- **Communities need direct economic returns to support protected areas and conservation programs.** Without revenues from conservation activities equal to or greater than forgone benefits from previously utilized resources (whether decreased use or a complete cessation of use), local support for conservation activities will be unattainable or short-lived. However, programs with clear and substantial returns from conservation activities should be successful and sustainable, because communities will support them. Whether through ecotourism, pastureland improvements, or watershed protection, the same principle is critical: Revenues need to be sufficient (although not necessarily cash) and tied directly to conservation.

Through large investments in Ethiopia programming, USAID has shown its commitment to the development of this strategically important country. For these efforts to reach their long-term objectives and be sustainable, it is critical that threats to the natural resources be addressed with conservation actions. Otherwise, all of the investments risk being trumped by the degradation of the base on which the population depends to survive.

I. INTRODUCTION

A. 118/119 Legislation and Purpose of this Assessment

The environmental requirements of the USAID operating unit's Operational Plans and Country Assistance Strategy are specified in ADS 201.3.8.2, Mandatory Technical Analysis for Developing Strategic Plans, Environmental Analysis, and are derived from the Foreign Assistance Act and 22 CFR 216.

The Foreign Assistance Act specifically addresses tropical forests and biodiversity in Sections 118, "Tropical Forests," and 119, "Endangered Species" and requires that all country plans include an analysis of the actions necessary to conserve biological diversity and tropical forests in that country and a description of the extent to which current and proposed USAID actions meet those needs. Section 118/119 analyses are requirements of all USAID operating unit Operational Plans and Country Assistance Strategies and should be conducted during the strategic planning process.

These assessments identify biodiversity and forestry assets within a country, discuss the impact of USAID activities there, and determine ways that current and future USAID programs could promote biodiversity conservation and sustainable forest management. In addition to responding to the requirement, a current 118/119 analysis can help guide proposed programs toward a more sustainable use of the country's renewable natural resources.

B. Methodology of this Assessment

Ethiopia's 118/119 assessment was conducted by a three-person team made up of two international consultants, Brian App of Chemonics International and Steve Anderson of the U.S. Forest Service, and a local consultant, Abebe Haile Gebremariam of the Non-Timber Forest Products Research and Development Project based in Addis Ababa.

To carry out the assessment, the team first reviewed the available literature and then conducted on-the-ground interviews to assess USAID/Ethiopia programming and biodiversity and forests in Ethiopia. In early May 2008, team members began reviewing background materials available through the Internet and the team leader with USAID Africa Bureau staff based in Washington, D.C., to gather information and began to organize the field work for the assignment.

In communications with the Addis Ababa and D.C.-based USAID staff, it became clear that much of the work normally conducted for a 118/119 assessment had recently been conducted by the European Union, the conclusions of which were available in a report (McKee 2007). The information in this document has formed the basis for the background information in this report; the team and time for fieldwork were reduced from the levels initially envisioned, and the focus was shifted to examining the current and proposed USAID programs in Ethiopia.

From 26 May to 6 June, the team conducted interviews and meetings with key stakeholders, including representatives of the government of Ethiopia, nongovernmental organizations

(NGOs), and USAID project staff. With guidance from initial conversations and an orientation meeting held in Addis Ababa on 27 May, the team focused its examinations and field visits on Southeastern Ethiopia to examine the issues and USAID programs there as well as potential sites for a planned ecotourism activity. The threats analysis and recommendations, nevertheless, cover the entire country and range of USAID programs.

The team conducted a six-day field trip in the southeast, spending 27-28 May in the Awash area, 29-30 May in the area around Yebello, and 31 May-1 June in the area around Bale Mountains National Park. Upon completion of the fieldwork, the team conducted additional Addis Ababa-based interviews, debriefed USAID on preliminary findings, reviewed documents obtained in-country, and drafted the report.

C. Ethiopia Background

Bordered by five countries in East Africa (Djibouti, Eritrea, Kenya, Somalia, and Sudan), Ethiopia's has the second-largest population in sub-Saharan Africa after Nigeria. More than 85 percent of Ethiopia's population lives in rural areas and depends on natural resources for their livelihoods, economic development, and food security. Nearly half of the population lives in poverty and is classified as undernourished; a continuation of resource depletion will have major consequences for the health and food security of the people and the economic development of the nation.

C1. Physical Background

With its dramatic geological history and broad latitudinal and altitudinal ranges, Ethiopia encompasses an extraordinary number of the world's broad ecological zones. With a high plateau and a central mountain range divided by Great Rift Valley, Ethiopia contains a huge altitudinal range from the depressions in the Afar (115 meters below sea level) to the mountaintops of Ras Dashen in the north (4,533 meters above sea level) and the Bale Mountains in the southeast. Although a landlocked country (the entire Red Sea coastline was lost after the independence of Eritrea in 1993), the headwaters of the Blue Nile are located in northwest Ethiopia at T'ana Hayk (Lake Tana). This range of habitats also supports a rich variety of species, which contributes to the overall biological diversity of the country.

Map of Ethiopia
Source: CIA World Factbook: Ethiopia

With diverse and isolated ecosystems and a large number of endemic species, the Ethiopian highlands form a major part of Conservation International's Eastern Afromontane hotspot

(http://www.biodiversityhotspots.org/xp/Hotspots/afromontane/Pages/default.aspx)[2]. Although this hotspot is one of the world's most important biodiversity areas, it is also one of the most degraded, and throughout Ethiopia the complex interdependencies of ecosystems are increasingly disturbed as the resource base of the country is degraded at an alarming rate. In addition to great species diversity, Ethiopia is an important center of genetic and agricultural diversity, with three major world crops believed to have originated there (coffee, grain sorghum, and castor beans).

C2. Population

Estimated at more than 78 million (2008), Ethiopia has the second-largest population in sub-Saharan Africa. Of the population, 43 percent are 14 years old or younger, the growth rate is more than 2.2 percent, and the life expectancy is less than 50 years. More than 60 percent of the population comprises the Oromo and Amara ethnic groups, and more than 60 percent of the population is Christian, with over 32 percent Muslim. Nearly 40 percent of the population lives in poverty, and literacy is low at 42 percent (50.3 percent for males and 35.1 percent for females) (CIA World Factbook: Ethiopia).

C3. Economy

The economy of Ethiopia is largely based on agriculture, which accounts for almost half of gross domestic product and 80 percent of total employment. The agricultural sector, however, suffers from frequent droughts, and the critical coffee subsector (exporting an estimated $350 million in 2006) is subject to swings in world markets for the commodity. According to the constitution of Ethiopia, the state owns all land and provides leases to the people for productive uses—principally agriculture (CIA World Factbook: Ethiopia). Exports are led by coffee and followed by mainly regional exports of *khat*[3], gold, leather, live animals, and oilseeds.

C4. Politics

Ethiopia is the oldest independent country in Africa and one of the oldest in the world (at least 2,000 years). The current ruling party has been in power since 1991 and the fall of the socialist regime of the Derg. The Ethiopian constitution was adopted in 1994, and its first multiparty elections were held in 1995. Ethiopia, however, remains a *de facto* one-party state, and a strengthening of the civil society and restructuring of the political processes are important for a move to a multiparty system. The next round of national elections is scheduled for May 2010.

[2] The Afromontane hotspot encompasses several widely scattered, but biogeographically similar mountain ranges appear in eastern Africa, from Saudi Arabia and Yemen in the north to Zimbabwe in the south.
[3] *Khat* is principally exported to Djibouti and Somalia and is legal in all three countries.

II. LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

A. Principal Environmental Institutions

Frequent restructuring of both federal and regional institutions has been a typical exercise for more than 20 years in Ethiopia. This has happened up to twice yearly. Environmental institutions are not exceptions; most have undergone frequent restructuring. The forestry sector has suffered most: A department around the beginning of 1980s (with approximately 60 staff) became a ministry in 1995 (with more than 300 staff), a department again after a year or so (with fewer than 20 staff), and a section from 2004 to 2007 with fewer than 10 foresters. Currently the forestry sector is almost nonexistent at the federal level. Following the new restructuring of the Ministry of Agriculture and Rural Development, the sector has only three foresters under the newly formed Sustainable Land and Watershed Management section.

The only stable institution (in relative terms), since its establishment in 1995, is the EPA. The Institute of Biodiversity Conservation (IBC) has also experienced some restructuring. In addition to its current mandate, the Institute was in charge of all biodiversity research activities, but lost this authority during a 2001 restructuring.

A1. Federal-Level Institutions

The two major environmental institutions, which are relatively stable in their organizational structure, are the EPA and the IBC. The Ethiopian Wildlife Authority, which later became the Ethiopian Wildlife Conservation Organization, was reduced to the department level in 2003. It regained its name—and probably its power and resources—this year. The Organization is now under the Ministry of Culture and Tourism.

Environmental Protection Authority. EPA was established in 1995 under proclamation 9/1995. EPA is involved with developing environmental policy and legislation, setting standards for environment media, monitoring pollution, establishing Environmental Impact Assessment laws, negotiating and signing access and benefit sharing agreements on genetic resources, and undertaking capacity development in relevant agencies.

Environmental Protection Council. The Environmental Protection Council was established by proclamation 9/1995. The council constitutes representatives from federal ministries to supervise EPA's work. EPA was supposed to be answerable to the Environmental Protection Council. However, this has not been the case because the council has been very weak or inactive—almost nonexistent—and does not seem to show any progress.

Institute of Biodiversity Conservation. The IBC is mandated to undertake the conservation (both *in situ* and *ex situ*) and utilization of biodiversity. Although research is not its current mandate as such, the institute is still involved in many biodiversity research activities. It is also mandated to maintain and develop international relations, implement international conventions to which Ethiopia is signatory, and undertake necessary preparatory studies before the country signs new or existing international conventions.

Ethiopian Wildlife Conservation Organization. Previously a semi-autonomous organization under the Ministry of Agriculture and Rural Development, it was reduced to a section under the Natural Resources department in 2005. It regained its name, and probably its power and resources, this year. Under the new name of Ethiopian Wildlife Conservation and Utilization Organization, it is expected that the organization's new mandate and status will provide opportunities for improved performance of the wildlife sector in the country.

A2. Regional-Level Institutions

Environmental institutions within the regional states are under the Bureau of Agriculture and Rural Development. Although there is slight variation in how these institutions are named, they have similar mandates in all regions. Commonly used names are Department of Environmental Protection, Department of Forestry Natural Resources Management, and Forestry Enterprises (in Oromiya Region).

B. Policies and Laws

Four main areas of federal and regional policy affect efforts in forest and biodiversity conservation and environmental protection: the Plan for Accelerated Sustainable Development to End Poverty (the reorganized Poverty Reduction and Sustainable Development Strategy Program), land administration, forestry, and investment.

Land administration laws. The Constitution of The Federal Democratic Republic of Ethiopia (FDRE), amended and approved in 1994, is the basis of all laws. The Ethiopian constitution, formally known as The FDRE Constitution, states the right to co-ownership or joint ownership of land and natural resources between the state and people of Ethiopia (Article 40, The Right to Property). Land is, therefore, owned by the state and the people of Ethiopia. This emanates from the assumption that land is both a factor of production and an essential element of welfare of the population (McKee 2007). A very important question that has been difficult in practice is how the people of the Ethiopia can exercise their rights over land, bodies of water, forests, and other natural resources, as only individuals and legal entities can have legal personalities, not just the people of Ethiopia. Articles 89(5) and 40 (6) of the constitution provide the state the right to manage—and therefore, to exercise control over—land and related resources. Although Article 43 (2) of the constitution states that the local people (communities) have the right to be consulted before any activity that affects their interest takes place (including commercial investment), Ethiopian laws are unclear as to what would happen if the community consulted did not agree; nor is there any indication as to how the consultation is to occur (Damitie 2006).

These and other subordinate legislative acts have been the root causes of insecure tenure and rapid land degradation in Ethiopia. In 2005, the Ethiopian government issued a land administration and registration policy which was amended in 2007 with support from the USAID through ELTAP. The aim of this proclamation was to increase tenure security, improve productivity, and avoid expectations of land redistribution. The proclamation provides that farmers have certificates of use giving them the right to cultivated lands, and that this right can be inherited or passed to others in accordance with the land administration regulation that followed the proclamation. These recent land certification

efforts have been in force in the regions of Tigray, Amhara, Oromiya, and the Southern Nations, Nationalities, and Peoples Regional States (SNNPRS). The land registration process is still underway and is experiencing serious capacity-related problems, including measurement, demarcation, and mapping. The expected tenure security, encouragement of rural investment, and increase in land productivity are yet to be seen.

Environmental laws. Ethiopia has many other laws that positively or negatively affect its environmental laws. These include access and benefit sharing for genetic resources, the Biodiversity Strategy of Ethiopia, the Plan for Accelerated and Sustainable Development to End Poverty, the Rural Land Administration and Registration Policy, and various other regulations, guidelines, and strategies.

The government of Ethiopia has conducted two major assessments regarding biodiversity since 2001: the Conservation Strategy of Ethiopia Evaluation Report and the National Biodiversity Strategy Action Plan. The Conservation Strategy of Ethiopia (CSE) was initiated in 1989 and ran for 12 years in 3 phases. In 1997, it was approved by the Council of Ministers, and it laid the foundation for the country's current environmental. A summary of Phase III was provided by Wood and Lemma (2001). The project's main goal was to develop capacity and an enabling environment for the implementation of the federal-level CSE and the 11 regional conservation strategies. Specific activities included support for:

- Obtaining approval of the CSE and the Environmental Policy of Ethiopia (EPE)
- Launching the CSE and EPE as the guiding documents for environmental policy and management in Ethiopia
- Developing federal-level guidance for the integration of environment into development planning
- Undertaking regional conservation strategy processes
- Developing a communication and awareness-raising program
- Involving Ethiopian environmental planners in an Africa-wide network.

Several activities were accomplished, but Wood and Lemma (2001) noted the following concerns which are still valid today for conservation in Ethiopia:

- The failure of the CSE to focus enough on turning policy into practical solutions to address environmental problems
- Limited policy development to date in related key areas, such as land use, which affects environmental management
- Slow progress in integrating CSE strategies and proposed actions into planning and field activities by government and other agencies and at all levels
- Limited development of institutional structures, especially at the regional level, to support the implementation of the CSE

Later, the government of Ethiopia developed a National Biodiversity Strategy Action Plan—NBSAP. (Institute of Biodiversity Conservation 2005). The NBSAP is a first attempt to meet the planning requirements of the Convention on Biological Diversity held in Rio de Janeiro in 1992. It contributes to achieving the millennium development goal of poverty

reduction and fosters grassroots participation by farmers and pastoralists. It provides a brief assessment of the current status of and threats to the nation's biodiversity (Chapter 2), outlines principles, goals, strategic objectives, specific objectives, and proposals for action over 15 years (Chapter 3); describes steps to coordinate biodiversity conservation efforts (Chapter 4); lists implementation measures (Chapter 5); and records monitoring and evaluation of the implementation process (Chapter 6).

The Environmental Policy of Ethiopia was based on CSE and effectively summarizes it in a policy document. Proclamation 295/2002 was issued for Establishing Environmental Protection Agencies at regional levels. Following the establishment of these environmental protection organs, the Environmental Impact Assessment and Environmental Pollution Control proclamations were issued.

Although the establishment of these organs and the existence of the environmental policies described above can be seen as a major step forward, a significant gap has been observed in policy implementation. The implementation of Environmental Impact Assessment Policy, for example, has been impaired by the SNNPRS investment policy, which states that land for investment will be given to investors irrespective of whether the investment project requires environmental impact assessment (EIA).

Forest laws. Federal Policy is now governed by the Forestry Development Conservation and Utilization Proclamation, issued in September 2007 (542/2007), which repealed Proclamation 94/1994. The policy recognizes two types of forests: state and private. State forests are any protected or productive forests owned by the federal or a regional state. Private forests are forests other than state forests that are developed by any private person and include forests developed by members of a peasant association or by any association organized by private individuals, investors, and governmental and nongovernmental organizations.

In theory, state forests are not available for use or settlement, but the exact location of these forests is uncertain. No official maps exist, no management plans have been prepared, and none have been gazetted. Regional and federal resources to delineate state forests and prepare management plans are extremely limited. As a consequence, considerable uncertainty exists as to whether the remaining montane highland forests in the southwest and southeast of the country would be allocated for agricultural investment. Currently, the land registration process does not register individually held land located within high forests on the assumption that these areas are state forests. The policies do not refer to the location of these forests or explain how they can be identified. This means that there are no legal grounds to resolve any conflict regarding the boundaries and locations of these state forests. Although this policy supersedes the 1994 proclamation, implementation guidelines have not been developed and there is no clue as to when this will be done. Until then, there are no rules for dealing with forest-related issues.

Investment laws. Federal Investment Proclamation 37/1996 vests the power of allocating land for investment activities in the regional governments. Accordingly, each region issued its own investment proclamations; however, the proclamations in some of the regions contradict the country's environmental policy, which was intended to guide all other

policies issued by both the federal and regional states. The SNNPRS regulation, for instance, does not require investors to present an EIA report prior to land allocation. According to the regulations, rural land may be allocated irrespective of any negative environmental impact.

C. International Conventions

Ethiopia is a signatory to the Convention on Biological Diversity and the United Nations Convention to Combat Desertification.

D. Regional Cooperation

The recently established The Horn Regional Environmental Network, financed by the government of The Netherlands, is working in environmental conservation. Member NGOs and Addis Ababa University work together on demand-driven, environment-related research and policy advocacy with a major focus on the cross-border Boma Park in Gambella.

E. Donor Community

The types of projects and the activities carried out in Ethiopia vary from donor to donor. Donors active in environmental conservation are the European Union; the governments of Norway, The Netherlands, and Finland; Swedish Development Assistance; Canadian Development Assistance; the Japanese International Cooperation Agency; the German Agency for Technical Development; and the United Nations Development Program—Global Environment Facility (UNDP-GEF).

In 2007, building on the CSE and the NBSAP, the European Commission produced a Country Environmental Profile (McKee 2007). In this report, McKee noted that

> Environmental degradation in Ethiopia ranges from very severe in rural areas to severe in urban areas. Soil erosion and degradation remains one of the most critical and far ranging environmental issues affecting the country. As a result of population increases, increased crop cultivation in marginal areas and increased livestock grazing pressure have also contributed to increased deforestation and soil erosion in the central highlands. In the forested areas of the south and southwest, deforestation is occurring at a sustained rate with major forestry threats including resettlement, commercial farming and fire. In the eastern and southern lowlands, commercial agricultural investments, rangeland enclosures, (re)settlement schemes, charcoal production and the relentless expansion of very aggressive invasive alien species are having a profound and detrimental effect on the natural resources availability, the traditional rangeland management systems and institutions in place and ultimately the livestock based pastoralist livelihoods of the Afar, Somali and Boran people. In this respect, the current agro-fuel investment scramble taking place in many lowland areas does not bode well for the future and stability of pastoralist livelihoods in Ethiopia.

Overall threats to biodiversity, ecosystems, and ecological processes and their root causes are summarized in Table 1 (UNDP-GEF 2005).

Table 1. Summary of threats to biodiversity and their root causes

Summary of Threats	Summary of Root Causes
Unsustainable use of natural resources	Increasing demand for natural resources
Overgrazing by large livestock population	Overdependence on natural resources, few alternatives[4]
Conversion of natural habitat, and consequent fragmentation and isolation	No regulatory ability, open access
Protected area system is not fully representative of all ecosystems, there are gaps in coverage.	• Poor agriculture planning, no intersectoral coordination, policy not harmonized, little political will • No incentives for conservation by stakeholders • No stakeholder participation • Wildlife damage crops, no rewards

F. NGO and Private-Sector Community

There are many NGOs working in areas of forestry and the environment. Some pioneer NGOs are the Ethio-Wetland and Natural Resources Association, FARM Africa, SOS Sahel, the Ethiopian Forest Coffee Forum, the Forum for Environment, MELCA Mahiber, the Frankfurt Zoological Society, the Ethiopian Wolf Conservation Programme (Born Free), ENDA Ethiopia, CARE Ethiopia, World Vision Ethiopia, and German Technical Cooperation.

Although the private sector community has been involved in forest and biodiversity conservation activities, all parks and sanctuaries, and many lodges (where available), are owned and run by the government. While many of the best lodges in Ethiopia are indeed owned by private-sector interests (both Ethiopian and expatriate) these are generally on private lands and not in the national parks. In the four national parks and reserves visited by the assessment team, only two had lodge facilities and both (Awash and Bale Mountains) were government-run. In the case of Bale Mountains National Park, the government has yet to approve long-standing requests to build lodges and improve the existing facilities.

In another case, African Parks (a private company) had agreements to take over management of the Nech-Sar and Omo National Parks, and a 25-year lease was signed with the government of Ethiopia. According to the information we obtained during our field visit, however, African Parks is withdrawing from the Nech Sar National Park because the government could not fulfill its obligations in the contract.

Non-Timber Forest Products (NTFP) Research and Development Project—Phase 2 in Southwest Ethiopia established seven farmers' NGOs (called PFM Associations) to take over forest management responsibilities in their designated areas. They have signed agreements with the local authorities, making their responsibilities clear and officially recognized.

[4] Alternatives include methods as well as activities. For example, alternatives to current (and traditional) systems are inhibited by a lack of functioning livestock markets or other infrastructure (e.g., mobile phone networks or banking systems) that facilitates more efficient livestock systems.

III. STATUS OF BIODIVERSITY AND FORESTRY RESOURCES

The status of biodiversity in Ethiopia may be most accurately conveyed through an examination of its constituent parts and the critical habitats upon which they depend. This section examines those parts and presents the status of aquatic, floral, faunal, and genetic biodiversity as well as the status of forests and protected areas in Ethiopia.

A. Status of Aquatic Biodiversity

Aquatic biodiversity is directly or indirectly affected by several conditions occurring in Ethiopia. Soil erosion has affected and continues to affect all parts of the country. Agricultural work on steep topography and on poor or degraded land reduces soil fertility and associated agricultural productivity. The accumulation of silt in water leads to degradation of water quality for aquatic organisms and human consumption and loss of storage capacity for livestock, irrigation, and hydroelectric power. Wetlands are an important aspect of Ethiopia's environmental resource base (McKee 2007). As part of complex environmental and socioeconomic systems and linked through the hydrological system to upstream catchments and downstream areas, the wetlands produce a range of ecological and socioeconomic benefits in their natural state that contribute to the well-being of rural communities and the environmental security of the country.

Freshwater Ecoregions of the World has typed four major habitats that represent the bulk of aquatic habitat in Ethiopia. The Ethiopian highlands (Region 525) harbor highly endemic biota, but the fish and fauna are not well known. Western highlands water flows into Sudan, and eastern highlands water flows towards the Gulf. Lake Turkana, (Region 530) with the Omo River, provides more than 90 percent of the lake's inflow. Compared to other large African lakes, Lake Turkana has relatively low fish species richness, providing a habitat for about 50 species, 11 of which are endemic. Unique to this lake is that the fauna is dominated by Nilotic riverine species, and many species migrate up the Omo River to spawn. The Northern Eastern Rift (Region 528) is the closed basins of Lake Awassa and of the Rift Valley Lakes (Abijata, Langano, Shala, and Ziway). These lakes contain few fish species but support most of the fish production. These lakes are important bird habitats, and many migrants stop to rest and feed here. The last major habitat in Ethiopia is Shebelle-Juba (Region 531) in the southeast, shared with Kenya and Somalia. Many endemic fish live in the streams and subterranean waters of this dry environment.

Many of the lakes and floodplains of major rivers also contain wetlands (marshes/swamps). Wetlands are currently threatened throughout Ethiopia. Threats noted by McKee (2007) include:

- Draining for agriculture use.
- Grazing. Specifically, the wetlands are often a last destination for pastoralists during the dry season in most parts of the country. However, increases in the livestock population, shortages of fodder, and the simultaneous expansion of agricultural activities have contributed to exacerbating the grazing pressure on wetlands. Compaction of the wetland by livestock is also known to have a significant impact on the infiltration capacity of the soil, hence affecting the hydrological system and

balance of the wetland itself. Loss of biodiversity is another negative impact of overgrazing.

- Overexploitation of wetland resources for water, food and raw materials (fish, reeds, water, medicinal plants, papyrus, etc.) that sustain the livelihoods of significant populations.
- Deforestation, siltation, soil erosion, and land degradation within a wetland catchment area—the starting cause for an accumulation of silt within the wetland ecosystem. In several parts of Ethiopia, many wetlands have already disappeared due to siltation.
- Urbanization, settlement, pollution from urban centers and industrialization.

Other major threats include the introduction of perennial crops into wetland ecosystems, the planting of high-water-demanding plants into the wetland ecosystem, the spread of invasive plants species within wetland areas, and government policies that encourage the draining of wetlands to meet the country's food shortages. All of these contribute to loss of wetlands, water tables, and biodiversity.

On our in-country review, we saw or discussed several examples where the government of Ethiopia and donors were working to minimize soil erosion. Projects such as thinning and burning *acacia* and then protecting and fencing the area from grazing can restore grassland vigor. Crop land has been terraced, and trees and shrubs have been planted to prevent erosion. But all these projects are minor actions, or "band-aids." As discussed in Section IV, the real solutions require a major shift in government policy and priority on land use rights and ownership, the use of livestock as a major monetary system, and safe and effective environmental practices.

McKee (2007) sums up the state of aquatic biodiversity well: Insufficient attention is paid to the fact that wetlands are part of extensive socioeconomic and environmental systems. The characteristics of a wetland (acting like a sponge), especially its hydrological regime, can affect the ecology—and therefore the agriculture—in the areas surrounding it through the local groundwater table it supports. The threat from overuse and unwise management of these resources might cause significant damage to the wetlands themselves and to the ecology of their environs and might reach a larger area. Furthermore, the loss of wetlands and their resources also will directly affect those who are directly and indirectly dependent on them for their livelihoods. However, wetlands are often seen as wastelands that have no value and are considered best converted by drainage to allow agriculture or grazing. Such conversion may create some new benefits in the short term—such increased food production and grazing—but will generally cause the loss of many other long-term benefits.

B. Status of Floral Biodiversity

Attempts to identify or classify ecosystems of Ethiopia have been limited or nonexistent thus far (Institute of Biodiversity Conservation 2005). Vegetation types in the country are being considered as ecosystems. The vegetation of the country falls into five recognized biomes: Sudanian, Congo-Guinean, Sahel arid zone, Somali-Maasai, and Afrotropical and montane. The new classification of ecosystems in Ethiopia is as follows: Afroalpine and sub-Afroalpine, dry evergreen montane forest and grassland complex, moist evergreen

montane forest, lowland semi-evergreen forest, *Acacia-Commiphora* woodland, *Combretum-Terminalia* woodland, desert and semi-desert scrubland, and inland waters (Institute of Biodiversity Conservation 2005). However, analysis carried out during the development of this project indicates a total of 17 ecosystems; of these, 7 are not represented at all in the protected area network (UNDP-GEF 2005).

Table 2. Plant species recorded to date in Ethiopia (modified from earlier reports such as Jacobs and Schloeder 2001 and Institute of Biodiversity Conservation 2005)

Group	Number of Species	Number of Endemics	~ % of Endemics
Plants	~6,000–7,000	~1,150	19

The ten ecosystems described by the IBC[5] are:

Afroalpine and sub-Afroalpine ecosystem. The areas that average higher than 3,200 meters above sea level are generally referred to as the Afroalpine and sub-Afroalpine. The lower limit of the Afroalpine belt falls at about 3,500 meters, while the upper limit of vascular plants lies around 5,000 meters and sub-Afroalpine areas ranges between 3,200 and 3,500 meters. These areas include chains of mountains, mountain slopes, and tops of the highest mountains in the country. The highest peak in Ethiopia is Ras Dashen, where an alpine climate near 0°C persists year-round, sometimes with a snow cover lasting a couple of days. However, dry lowland savannas and deserts surround this moist highland area. Ethiopia has the largest extent of Afroalpine habitats in Africa.

Montane grassland ecosystem. The montane grassland ecosystem is distinguished from other types of ecosystems by its physiognomy, floristic composition, and ecology. It consists of a herbaceous stratum, usually not higher than 30-80 centimeters, very rich in perennial grasses and species of Cyperaceae, but also with sub-shrubs and perennial herbs, among which bulbous and rhizomatous plants occur. The original climax vegetation on the montane grassland of Ethiopia is believed to have been a dry evergreen montane forest intermingled with small areas of grassland. The montane grassland of Ethiopia is a derived vegetation type, although small areas of the grassland may have existed before human settlement.

Dry evergreen montane forest and evergreen scrub ecosystem. The Ethiopian highlands contribute to more than 50 percent of the land area with Afromontane vegetation, of which dry montane forests form the largest part. The evergreen scrubland vegetation occurs in the highlands of Ethiopia either as an intact scrub (i.e., in association with the dry evergreen montane forest) or usually as secondary growth after deforestation of the dry evergreen montane forest. The dry evergreen montane forest and evergreen scrubland vegetations are the characteristic vegetation types of this ecosystem.

Montane moist forest ecosystem. The montane moist forest ecosystem comprises high forests of the country—mainly the southwestern forests—which are the wettest, and also the humid forest on the southeastern plateau known as the Harenna forest. The montane moist forest ecosystem is distinguished by supporting luxuriant growing epiphytes

[5] http://www.ibc-et.org/?page_id=104.

Canarina, orchids, *Scadoxus* and fern plants such as *Platycerium* and *Drynaria*. Mosses also occur in the wettest portions of forests, associated to major branches and barks of trees.

Acacia-Commiphora *woodland ecosystem.* The *Acacia-Commiphora* ecosystem is known for its varying soils, topography, and diverse biotic and ecological elements. These plant species are with either small deciduous leaves or leathery persistent ones. The density of trees varies from high, in which they form a closed canopy, to scattered individuals to none at all forming open grasslands. The grasses do not exceed more than 1 meter; thus, no true savannah is formed.

Combretum-Terminalia *ecosystem.* This ecosystem is characterized by *Combretum spp., Terminalia spp., Oxytenanthera abyssinica, Boswellia papyrifera, Anogeissus lieocarpa, Sterospermem kuntianum, Pterocarpus lucens, Lonchocarpus laxiflorus, Lannea spp. Albizia malacophylla*, and *Enatada africana.* These are small trees with fairly large deciduous leaves, which often occur with the lowland bamboo, *Oxytenanthera abyssinica.* The understory is a combination of herbs and grasses. The herbs include *Justecia spp., Barleria spp., Eulophia, chlorophytum, Hossolunda opposita* and *Ledeburia spp.* The grasses include *Cymbopogon, Hyparrhenia, Echinochla, Sorghum, Pennisetum,* and others. The herbs usually dominate the ground layer at the beginning of the rainy season, while grasses dominate toward the end of the rainy season.

Lowland tropical forest ecosystem. The characteristic species of this forest are *Baphia abyssinica* and *Tapura fischeri*. The common species in the upper canopy include *Celtis gomphophylla, Celtis toka, Lecaniodiscus fraxinifolius, Zanha golungensis, Trichilia prieureana, Alistonia boonei, Antiaris toxicaria, Malacantha alnifolia, Zanthoxylum lepreurii, Diospyros abyssinica, Milicia excelsa, Baphia abyssinica, Vepris dainellii*, and *Celtis zenkeri.*

Desert and semi-desert ecosystem. This is a very dry zone that is vulnerable to wind and water erosion even with little or no pressure on the vegetation from grazing. The vegetation consists of deciduous shrubs, dominated by *Acacia sp.* interspersed with less frequent evergreen shrubs and succulents. It has very variable grass vegetation. The people of the area are pastoral and agro-pastoral. Large-scale irrigated agriculture is gaining importance in some areas of the ecosystem. This ecosystem is the extreme lowland region of the country. The flora has developed an advanced xeromorphic adaptation. Shrubs and trees have developed dwarf growth and have small, sclerenchymatic or pubescent leaves.

Wetland ecosystem. Ethiopia possesses a great diversity of wetland ecosystems (swamps, marshes, floodplains, natural or artificial ponds, high mountain lakes, and micro-dams) as a result of the formation of a diverse landscape subjected to various tectonic movements, a continuous process of erosion, and human activities. The different geological formation and climatic conditions have endowed Ethiopia with a vast group of water resources and wetland ecosystems, including 12 river basins, 8 major lakes, and many swamps, floodplains, and man-made reservoirs, with a total annual surface runoff of about 110 billion cubic meters.

Aquatic ecosystem. The Ethiopian aquatic ecosystem has high-diversity areas such as major rivers and lakes that are of great national and international importance. The country is well known for its richness in water potential. There are about 30 major lakes located in different ecological zones and situated at altitudes ranging from about 150 meters below sea level up to 4,000 meters. The surface area of the lakes varies considerably from less than 1 square kilometer to more 3,600 square kilometers, and mean depths range from a few meters to more than 260 meters. However, the major lakes that are of economic importance are concentrated in the Rift Valley.

The Institute of Biodiversity Conservation (2005) provides examples of horticultural resources such as bacterial and fungal species of value present in Ethiopia, plants, parts of plants and distribution of medicinal plants and traditional remedies, pasture and forage plants, and agricultural crop species. Despite the immense wealth of genetic resources and amicable environment, crop production is low both quantitatively and qualitatively. Present-day agricultural practice in Ethiopia pays little attention to valuable habitats, and multipurpose wild edible fruits, vegetables and some spices are on the verge of extinction. Many aromatic plant species are harvested from the wild without considering the population of plants, leading to uncontrollable exploitation. The major threat to pasture grasses is overgrazing.

The land tenure system is a major factor behind the poor adoption of land improvement and management practices that result in a loss of natural habitats. Because of increasing population pressure, there are frequent human encroachments and unsustainable use of resources in protected areas, resulting in widespread destruction of natural habitats. As a result of intensive human pressure, most floral and faunal resources of Ethiopia are at risk.

C. Status of Faunal Biodiversity

The sum of the area of the wildlife conservation and forest areas—a total of 16 percent of Ethiopia's area—is above the global average. These areas contain sites set aside mainly for conservation and others for sustainable use of resources (timber, hunting). Ethiopia also has expressed her commitment to biodiversity through her constitution and the ratification of a number of international agreements, including the Convention for Biological Diversity (UNDP-GEF 2005). However, these areas offer little more than nominal conservation and provide no protection for fauna and flora.

Table 3. Statistics for groups of species recorded to date in Ethiopia (modified from earlier reports such as Jacobs and Schloeder 2001 and Institute of Biodiversity Conservation 2005)

Group	Number of Species	Number of Endemics	~ % of Endemics
Mammals	280	31	11
Birds	861	28	3
Reptiles	201	9	4
Amphibians	63	24	38
Freshwater fish	168–183	37–57	22
Butterflies	324	7	2
Plants	~6,044	~1,150	19

The IUCN 2007 threatened species for Ethiopia are listed in Annex D. Six species are critically endangered, 23 are threatened, and 70 are listed as vulnerable. Plants as well as invertebrates are included on this list.

McKee (2007) notes the following:

> "There are a number of charismatic flagship species, most notably the gelada (an endemic genus and the world's only grazing primate), the mountain nyala (an antelope endemic to the Afroalpine ecosystem), the Ethiopian wolf (a palaearctic descent from a wolf-like ancestor that crossed into the Ethiopian highlands just over 100,000 years ago), and the walia ibex (another palaearctic species confined to areas in the Simien Mountains). The large mammal populations cannot be compared with the wildlife spectacles of Kenya or Tanzania. However, there are remnant populations of elephant (an estimated 850, including 150 of *Loxodonta africana orleansi*), lions (an estimated 1,000) and large ungulates. Spotted hyenas are abundant; indeed, they flourish and are largely tolerated in Ethiopia. There is at least one and a possible further two isolated populations of black rhino."

Bushmeat does not seem to be a significant issue in Ethiopia. Hunting by the local populations does occur, but some species are highly restricted and severe penalties for catching them apply; thus, certain species are protected. Large areas of Ethiopia are designated as controlled hunting areas, but the figures for Ethiopian nationals and international hunter permits are pathetically low to stimulate any reasonable local industry or jobs involving hunting, guiding, and outfitting. It seems reasonable that, with better population data and marketing, more efforts to create an industry around hunting could be made. It is often said that in the United States, without hunters, there would be no habitats maintained for or huntable populations of some animals. Groups such as Safari Club International, the Foundation for North American Wild Sheep, and the Rocky Mountain Elk Foundation all support habitat acquisition, habitat enhancement, and species conservation.

The list of huntable animals includes endemic mammals—a unique situation for Ethiopia because hunters have no other place to go to possess these unique trophies. Some additional opportunities for tourists who come for hunting are the special scenic features of hunting areas, the culture and traditional livelihoods of the indigenous people, attractive and unique topography, and pleasant weather. Tour operators specializing in hunting include Wildlife Safaris, Ethiopian Rift Valley Safaris, Rocky Valley Safaris, and Libah Safaris[6].

The country spans two hotspot areas: the Horn of Africa and the Ethiopian Highlands (which is included in the Eastern Afromontane hotspot). The areas included in the hotspots cover the majority of the country, including the entire eastern area of Ethiopia below 1,100 meters and all highland areas above 1,100 meters.

Ethiopia encompasses a broad range of ecosystems with great varieties of habitats that contribute to the occurrence of high faunal diversity. However, information on terrestrial fauna as a whole is limited to mammals, birds, reptiles, amphibians, and a few groups of

[6] Details on tour packages and destinations are presented on www.seeyouinethiopia.com.

arthropods. The variety of species and great proportion of endemicity within the groups, particularly in the highlands, is the result of the isolation of Ethiopia's highland areas from other highlands within and outside the country by the surrounding lowlands. To conserve wildlife genetic resources, Ethiopia has established protected areas. But all protected areas are subject to threats from policy decisions, lack of regulations or enforcement, settlement within or adjacent to the parks, crop cultivation, grazing, and deforestation.

D. Status of Genetic Biodiversity

Ethiopia is one of the most unusual and important sources of biodiversity in the world for wild, cultivated, or domestic organisms due to its high number of endemic species, the genetic diversity of several cultivated crops, and the variety of breeds of cattle, goats, sheep, camels, horses, and donkeys.

Ethiopia understands the value of genetic diversity and preservation and established the IBC in 1998. Among developing countries, Ethiopia is one of the pioneers in the field of access and benefit sharing of genetic resources and traditional knowledge, taking advantage of the outstanding expertise available in the IBC and EPA (McKee 2007). The general objective of the IBC is to undertake conservation, study, and research and to promote the development and sustainable utilization of the country's biodiversity. As of June 1998, the mandate of the IBC has been expanded not only to plant genetic resources but also to animal and microbial genetic resources. Ecosystem management is also recognized as one of the areas to receive top priority. Apart from its more visible *ex situ* conservation activities, the institute also has successfully expanded and implemented numerous *in situ* conservation programs in partnership with rural communities.

The National Biodiversity Strategy and Action Plan (Institute of Biodiversity Conservation 2005) and McKee (2007) provide excellent sources for the resources associated with microbial diversity and conservation status, flora (including crops), forest resources, field crop resources, horticultural crop resources, essential oil-bearing plant resources, medicinal plant resources, pasture and forage genetic resources, wild and domestic fauna, wild faunal resources in protected areas, and domestic faunal resources. Protection of these resources is outlined in the Strategy. The four Strategic Priorities of Ethiopia's Biodiversity Strategy and Action Plan (Institute of Biodiversity Conservation 2005) are:

- Representative examples of Ethiopia's remaining ecosystems are conserved through a network of effectively managed protected areas
- By 2020, all remaining natural ecosystems outside of the protected are under sustainable use management
- The costs and benefits of biodiversity conservation are equitably shared through a range of public, private, community-based, and NGO partnerships for protected area management and for sustainable use and marketing of biodiversity
- The rich agro-biodiversity of Ethiopia is effectively conserved through a mix of *in situ* and *ex situ* programs

The realization of the economic potential of the biodiversity of genetic resources in Ethiopia is beginning to take shape. The protected areas harbor genetic resources of global

importance. One notable example is the wild coffee found within the forests of southwest and south-central Ethiopia. Given that coffee was domesticated in Ethiopia and that the center of endemism—and thus genetic diversity—is found within these forests, they are valuable to coffee growers the world over. Studies have indicated, for example, that the potential international value of the genetic variation in wild coffee harbored in the natural forests of Ethiopia amounts to between US$0.5 and 1.5 billion per year (UNDP-GEF 2005). The continuation of the European Union's NTFP program (Tefari 2006) will assist in recognizing the protection these native materials.

It appears that the country has served as a gateway to genetic material from Asia to Africa, and its diverse ecology gave rise to further diversification and thus contributed to developing the huge genotypes the country hosts today. Several plant species whose maximum productivity lies between 1,800 and 2,100 meters were domesticated in the highlands, which include their centers of diversity and origin (UNDP-GEF 2005). Ethiopia has very high genetic diversity in four of the world's widely grown food crops (wheat, barley, sorghum, and peas), in three of the world's most important industrial crops (linseed, castor bean, and cotton), in the world's most important cash crop (coffee), in a number of food crops of regional or local importance (teff, finger millet, cowpeas, lentil, enset, etc.), and in a number of groups of forage plants of world importance (clovers, lucerns, oats, etc.) (Institute of Biodiversity Conservation 2005). Ethiopia is one of the 12 Vavilov Centers of crop diversity. In this regard, the contribution of Ethiopian farmers in generating and maintaining the diversity of many crop plants has been indispensable. Ethiopia also has long been recognized as a center of diversity for domestic animal genetic resources (Institute of Biodiversity Conservation 2005).

In terms of estimated livestock population, the country holds first, second and third positions in cattle, sheep, and goat populations in Africa, respectively. Ethiopia also ranks third in livestock population in world. Regarding the equine population, the Institute of Biodiversity Conservation (2005) indicated that Ethiopia has 32.4 percent of Africa's donkeys, 41.6 percent of its horses, and 65 percent of its mules.

E. Status of Forests

Trees, woodlands, and forests can be seen as an environment's lungs. They play a crucial role in tempering the effects of climate and help protect vital water catchments. Trees provide a wide range of products, including food and fruit, fodder for livestock, and medicines for both people and livestock. Forests supply goods of commercial, cultural, and sacred value, and they comprise a vital safety net in times of need. The trees and forests of Ethiopia are under tremendous pressure because of the drastic decline in mature forest cover and the continual pressures of population increase, rudimentary farming techniques, land use competition, land tenure, and forest degradation and conversion. The status of the forest resources should be considered at risk.

Although deforestation is known to occur in the remaining forested areas of the country, rates of deforestation have been more difficult to estimate. Data provided by McKee (2007) indicate rates of deforestation of 146,000 ha/year (Table 4).

Table 4. Summary of deforestation rates

	Area in hectares	
	2000	**2005**
Forest	3,651,935	3,337,988
High woodland area	10,049,079	9,632,616
Plantations	509,422	509,422
Low woodland and shrubland	46,297,530	46,297,530
Other land	53,169,093	53,899,503
Inland Water	828,277	828,277
Total	**114,505,336**	**114,505,336**

Although estimates for historical forest cover vary, it has been obvious for centuries that the forests are being depleted. Virtually all household cooking fuel used in rural Ethiopia, where about 85 percent of the population lives, comes from solid fuels; rural Ethiopian households have depended for centuries on two main types: woody biomass and dung (Mekonnen and Köhlin 2008).

Numerous reports available online discuss the history of forest product use in Ethiopia. The European Union is funding a project (Tefari 2006) on NTFPs that aims to contribute to the rural poverty reduction efforts of the government of Ethiopia through sustainable utilization and management of forest resources. The project attempts to demonstrate that forests can contribute to reduction in poverty through improved production, processing, post-harvest handling, and trading of NTFPs. The project is expected to achieve two specific aims:

- Increase local institutional capacities for improved NTFPs use and sustainable forest management
- Promote sustainable utilization and trading of NTFPs and sustainable use of forest and land resources

A large number of forest priority areas (FPAs) were established in the 1980s; by 1994, the government had classified 58 FPAS covering 2.8 million hectares in the 1994 Ethiopian Forestry Action Program (UNDP-GEF 2005). The FPAs are listed in Annex E. Reflecting the predominant view of the time, forests were considered primarily for human exploitation rather than areas to be protected. Thus, forests were not included in the wildlife protected area network. However, the few management plans written prior to 1994 for FPAs were considered, in 1994, to be technically and financially unfeasible. The delineation of these areas was done primarily on maps; a few had been demarcated. None has been gazetted. These forest priority areas are inadequately protected and managed.

Deforestation has led to the depletion of soil nutrients, contributing to low agricultural productivity and limited domestic food supplies in sub-Saharan Africa (Mekonnen and Köhlin 2008). An indirect result of deforestation is overgrazing. In part, the number of cattle in the country results from the absence of fuelwood (what there was, say, 50 years ago has largely been removed through human exploitation for fuel and construction), because some Ethiopian highlanders use cattle dung as their main source of fuel (UNDP-GEF 2005). Thus, fertilizer use in Ethiopia is among the lowest in sub-Saharan Africa.

Deforestation has been caused by the use of fuelwood or charcoal, as seen in all urban and rural areas of Ethiopia. The proclamation regarding the legality of charcoal as a source of fuel needs to be addressed. Charcoal is currently made, sold, transported, and used as a major source of fuel in Ethiopia despite its apparent ban. The law is selectively ignored by people involved in the charcoal industry and in transport and enforcement.

A large proportion of Ethiopia's forests and rangelands are open access resources or are ineffectively controlled under crumbling common property regimes and the state. Although open access is probably the most equitable of all access systems, it inevitably leads to the destruction of the resource and pressures on the resource build (Institute of Biodiversity Conservation 2005). The land tenure system is a major factor behind the poor adoption of land improvement and management practices. Repeated studies have confirmed that land security enhances proper land management and increased productivity. When the state administers the land, farmers may not feel secure enough to invest in soil protection and land improvement activities. Moreover, with growing population pressure, the degree of land fragmentation continuously increases; this aggravates tenure insecurity as well as land degradation, with consequent degradation in environmental resources and productivity.

Reforestation programs resulted in the planting of millions of seedlings in community forests throughout Ethiopia. A number of NGOs, which had to organize their activities through local associations, supplemented government efforts to rehabilitate Ethiopia's forests. However, critics maintain that both systems caused communal resources to be developed at the expense of private needs. As a result, reforestation programs did not perform well. Seedling survival rates were as low as 10 percent in some areas, largely because of inadequate care and premature cutting by nearby residents (McKee 2007).

During our interviews, we observed different viewpoints on the value of tree planting. The most serious issues dealt with the selection and survival of species and the monitoring of the watershed or plantations. The main threats to forest resources (trees, fruits, and nuts) include deforestation, resettlement, commercial farming, fire, overgrazing, and absence of policies and laws addressing farm forestry and land tenure (Institute of Biodiversity Conservation 2005 and McKee 2007).

F. Status of Protected Areas

Between 1965 and 1980, 9 national parks, 4 wildlife sanctuaries, 7 wildlife reserves, and 18 controlled-hunting areas were established (Annex D). However, only two, Simien National Park and Awash National Park, have been officially gazetted. Even these two have never been adequately secured, staffed, or equipped. The status of the numerous "wildlife reserves and sanctuaries" and controlled hunting areas is little more than nominal and provides no protection for their fauna and flora. Only limited regulations exist, and enforcement is lacking. Some of these protected areas were created without consideration for adjacent communities or were created with settlements within their boundaries; certainly, more people now live in and use the protected areas than was the case before 1980. Our visits to four protected areas are highlighted in this report.

It is useful to consider a new paradigm for the protected areas in Ethiopia. National parks—and their management—in the United States differ significantly from national parks, reserves, or sanctuaries in Ethiopia. These protected areas appear to function more like unmanaged state forests with multiple resource uses (grazing, settlements, agriculture, fuel, wood gathering, etc.), with low priority given to conservation and preservation of wildlife and habitats.

Conservation and preservation of Ethiopia's national parks and other protected areas face a complex future in areas where poverty is great and use of resource is high. Protection without concern for the human element is impossible. Biodiversity and human livelihood have to be connected, and local communities must find ways to implement responsible policy, management, and support. Respect for the protected areas must take into consideration tourism, employment, profit sharing, acceptance of the global value of biodiversity and the regional need for clean and dependable water, and local land management planning.

A long-term protected areas system funded by UNDP-GEF and launched in 2006 had two aims: to preparing a master plan for future investment to improve the conservation and management of the protected areas system in Ethiopia and to strengthen management capacity and coordination at both national and regional levels (McKee 2007and UNDP-GEF 2005).

The central themes of concern for biodiversity are:

- Improving the capacity, infrastructure, and management linkages between governments and departments
- Providing assistance to communities living adjacent to the protected areas
- Improving management of resources (fuel efficient stoves, cropland fertility, non-farm jobs) at the community level
- Most importantly, implementing institutional and policy reforms regarding land tenure, the legal status of protected areas, and the management of sustainable natural resource

These actions will help secure the protected areas and, with appropriate authority, may allow the protected areas to be respected and valued by the local communities.

Awash National Park *(visited 28 May).* The Awash National Park was established in 1966 and gazetted in 1969. It is located at the southern tip of the Afar Region, 225 kilometers east of Addis Ababa and a few kilometers west of Awash, with its southern boundary along the Awash River. The park covers at least 756 square kilometers of acacia woodland and grassland. The Addis Ababa-Dire Dawa highway passes through this park, separating the Illala Saha Plains to the south from the Kudu Valley to the north.

Wildlife in this park include the East African oryx, Soemmerring's gazelle, dik-dik, and the lesser and greater kudus, as well as more than 450 species of native birds (Birdlife International). In the upper Kudu Valley at Filwoha are hot springs amid groves of palm

trees. Awash National Park is recognized as an excellent birding site by the African Bird Club and is recognized as an Important Bird Area by Birdlife International (Birdlife International[7]). The Awash is a major river in Ethiopia that is recognized as a World Heritage Site.

We probably saw more livestock than wildlife, but we observed baboons, lesser kudu, oryx, gazelles, goshawks, ground hornbills, and bee-eaters during our short stay. We noticed several oryx along the main road and on savanna with remaining grass. The visibility of the main road offers some protection for wildlife some livestock from grazing.

Conservation issues (Birdlife International). The most important issue has been and continues to be intertribal conflict over the traditional rights of the Kerreyu, Afar, and Itu pastoralists for dry-season grazing and access to water, and the absence of adequate alternatives or compensation for these people. The infrastructure is largely intact, including about 180 kilometers of tracks, an airstrip, headquarters (including a small museum), staff buildings, a caravan hotel (in need of a major upgrade or revision to attract the modern tourist), and a campsite for visitors. However, the park's management faces escalating human pressure from several permanent settlements in the park, and various tribal groups and their animals have moved into much of the park—mostly on the western and northern sides. Fires are frequent. Pollution of the Awash River and Lake Beseka from a sugar estate and other large-scale irrigated farms upstream is a problem that must be monitored. The road and railway tracks that bisect the park are hazardous for the animals and provide easy access for poachers; these should be monitored. The park must be surveyed for unwanted vegetation (*Prosopis*), which must be treated when found.

Abijatta-Shalla National Park *(visited 31 May).* Abijatta-Shalla National Park (or the Rift Lakes National Parks) is located in the Oromia region, 200 kilometers south of Addis Ababa and east of the Ziway–Shashamane highway. The park contains 887 square kilometers, including the Rift Valley lakes of Abijatta and Shalla. The two lakes are separated by three kilometers of hilly land. More than 450 species of birds have been recorded in the park, which is recognized as an Important Bird Area by Birdlife International[8]. Although the park was intended to protect the scenic beauty of the area and wildlife such as the diverse avifauna and, in particular, water birds, few wild animals currently can be viewed there.

Apart from the two lakes, the primary attraction of this national park is a number of hot springs at the northeast corner of Lake Abijatta and large numbers of flamingoes on the lake. During the tumultuous last days of the Derg regime and for some time afterwards, large numbers of nomads took advantage of weakened central authority and set up residence in the park with their livestock. Park personnel reported in 2005 that these nomads had some 15,000 cattle in the restricted confines of the park.

A very small portion of the park is fenced and protected. Warthogs, ostriches, and impalas were seen. We saw barely a blade of grass remaining as we drove through settlements to

[7] http://www.birdlife.org/datazone/sites/index html?action=SitHTMDetails.asp&sid=6262&m=0.
[8] http://www.birdlife.org/datazone/sites/index html?action=SitHTMDetails.asp&sid=6282&m=0.

reach a scenic viewpoint. We noted numerous agricultural developments, settlements, and livestock around the two lakes.

Conservation issues (Birdlife International). The park has not been legally gazetted. Adjacent to the major recreation resort of Lake Langano, the park received many visitors in the 1980s although it did not receive the support of the local people. During the early 1990s, the park went into decline. Local people use the area for agriculture and grazing despite the unsuitability of the soil. Additionally, much of the *Acacia* woodland surrounding Abijatta has been cut down for charcoal. People from the urban centers used to come and fish illegally in Lake Abijatta. The soda-ash extraction plant on the northeastern side of Lake Abijatta probably has the greatest impact on the area.

Abijatta-Shalla used to support one of the largest African colonies of *Pelecanus onocrotalus*; the birds bred on an island in Lake Shalla and fed their chicks on fish caught in Lake Abijatta. Pelicans and other fish-eating birds deserted the area because of declining fish stocks in the lake. This situation appears to be reversible: in December 1996, heavy rains caused the level of the lake to rise, and there were reports of fish in the lake and a group of pelicans apparently fishing.

Key development requirements include an integrated water management and monitoring program, direction of revenue from the growing tourist industry to the wildlife authority, integration of local people in the development of the park, and control of access to and use of the woodlands.

Bale Mountains National Park *(visited 2-3 June).* Bale Mountains National Park is in the Oromia region of Southeast Ethiopia. Park headquarters are on the northern border at Dinsho, 400 kilometers by road from Addis Ababa. Created in 1970, the park covers about 2,200 square kilometers of the Bale Mountains to the west and southwest of Goba in the Bale Zone. The park is listed as a Biosphere Reserve by UNESCO's Man and the Biosphere Programme; it is proposed as a World Heritage Site recognized by UNESCO (UNESCO World Heritage) and is currently on the tentative list pending final status.[9] The park is the most important component of the Ethiopian Highlands Biodiversity Hotspot as recognized by Conservation International.

The Bale Mountains are nearly as high as those of Semien, with peaks over 4,000 m, such as Tullu Demtu—at 4,337 meters (14,225 feet), the second-highest peak in Ethiopia—and Batu (4,307 meters). The Bale Mountains contain three distinct ecoregions: the northern plains, bush and woods; the central Sanetti Plateau, with an average elevation of more than 4,000 meters; and the southern Harenna Forest, known for its mammals, amphibians, and birds, including many endemic species. The central Sanetti Plateau is home to the largest population of the rare and critically endangered Ethiopian wolf[10]. The Bale Mountains National Park has a number of Ethiopia's highland endemic species and many species not found elsewhere in sub-Saharan Africa (African Bird Club).

[9] Information about the tentative list are provided at http://whc.unesco.org/en/tentativelist/.
[10] Detailed information about the Ethiopian wolf and its status are available at http://www.iucnredlist.org/search/details.php/3748/summ and http://www.ethiopianwolf.org/index.shtml.

Above 3,000 meters elevation lie the Ethiopian montane moorlands, the largest Afroalpine region in Africa. The Afroalpine moorland in this park is extremely rich in endemic plants, with predictions of 30 percent highly plausible (Birdlife International[11]). The montane moorlands lie above the tree line and consist of grassland and moorland with abundant herbs and some shrubs. The park warden reminded us that more than 265 species of birds have been recorded, including 6 Ethiopian endemics and many threatened species (Birdlife International); 80 mammals, with 17 endemics; and about 1,300 plants, with 163 endemics. This area also is the catchment for 40 springs and rivers that leave the park.

The Bale Mountains are a center of endemism (Frankfurt Zoological Society 2007). Endemic species include the Ethiopian wolf (the rarest canid in the world); the mountain nyala; the Bale monkey; one bovid; one hare; and eight species of rodents, including the giant mole rat, which is found exclusively in the area. Several rare and endemic amphibians are found only in Bale; 163 plants endemic to Ethiopia (23 to Bale alone) are present among 1,321 species of plants recorded there. The Harenna forest still contains habitats for lions, the endangered African wild dogs, and giant forest hogs. Seventeen percent of the Afroalpine habitat in Africa is found in the Bale Mountains. The Bale Mountains are critical to some 12 million downstream users living along the 40 springs and rivers that leave the mountains. Wild coffee and medicinal plant hotspots have been identified. Amazing scenic mountain and forest values, as well as cultural and social values, are associated with Bale Mountains National Park.

The Bale Mountains have outstanding tourist potential, but there is little there to encourage tourists to make the eight-hour trip from Addis Ababa. In the 16 years prior to 2005, the park registered only 2,277 local and 10,900 foreign visitors (Frankfurt Zoological Society 2007). Only about 1,000 foreigners and 170 Ethiopians visited the park in 2005. In contrast, Simien Mountains National Park has about 5,000 visitors, generating enough income to cover the park's basic management costs.

Despite the amount of human encroachment in this jewel of Ethiopia, we saw several endemic species of birds, mammals, and plants. This area is an incredible treasure for Ethiopia that has great potential for international tourism and employment in the tourist industry. Species seen on 2 June 2008 with the help of a guide include the mountain nyala, Ethiopian wolf, warthog, bush buck, reed buck, waterbuck, giant mole rat, wattled ibis, olive thrush, white-browed robin chat, tacazze sunbird, vitelline weaver, common bulbul, drongo, chestnut-naped francolin, Rogerts rail, groundskeeper thrush, auger buzzard, mountain buzzard, yellow-billed duck, blue-winged goose, ruddy shellduck, spot-breasted plover/lapwing, red-billed cough/crow, African citril, brown-rumped seedeater, moorland francolin, cisticola, and dusky flycatcher.

Animals, including the Ethiopian wolf and mountain nyala, the wonderful scenery, trekking opportunities, and unique vegetation can be wonderful tourist attractions. Communities in other places have used wildlife to attract visitors (Casey and Schrader 2006).

[11] http://www.birdlife.org/datazone/sites/index html?action=SitHTMDetails.asp&sid=6288&m=0.

Conservation issues (Birdlife International). The park has not been legally gazetted. Livestock are still allowed to graze in all parts of the park, including the extreme high altitude Afroalpine area, and all habitats continue to be disturbed. In 2002, the livestock in a discrete area of the Bale Mountains reached an unprecedented density of 314 animals per square kilometer (UNDP-GEF 2005). Overgrazing also increases competition between livestock and wildlife species. The Ethiopian wolf is reportedly harassed on the Sanetti Plateau, where it is easily accessible from the road that passes through the park. The population also is affected by interbreeding, canine distemper, rabies caused by contact with local dogs, and negative attitudes and misconceptions about wolf predation on livestock.

Local people have always used the park, particularly the Sanetti Plateau and Harenna forest, but in the 1970s few people lived in the park and now thousands of people and their livestock are resident, particularly in the fertile river valleys in the north and on the Sanetti plateau. Burning of vegetation has increased, and the grazing pressure on the Afroalpine moorland is very high. There is a conflict in the Harenna Forest between the needs of the lumber industry and the need to conserve the part of the forest within park boundaries. However, a sawmill has been installed at Mena, to the south of the Harenna Forest, and large timber trees are being logged out. There is also increasing use of the forest to supply construction material, fuel, and charcoal for the expanding urban populations in the area. All levels of government, including the local council created to help develop plans for the park will be able to reduce the pressure from human usage on this unique and fragile area.

A management plan for Bale Mountains National Park has been completed (Frankfurt Zoological Society 2007), and a copy was given to USAID during the closeout on 6 June. The development of management plans for this and other protected areas shows that the stakeholders, scientists, and managers know what needs to be done to conserve the habitat and species; the greatest challenge is changing the culture and attitudes of all levels of involved people. Effective management of this critical area has been diminished by a lack of human and financial resources, political interest, and technical knowledge.

Two zones are planned for Bale Mountains National Park. The conservation zone comprises more 50 percent of the park, with relatively little permanent settlement. Settlement, infrastructure, and cultivation are allowed under negotiated management agreements for utilization of natural resources in both the conservation zone and the sustainable natural resource management zone.

Threats include agriculture expansion; livestock overstocking; wood extraction; fire; settlement; unsustainable harvesting of non-timber products; poaching and human disturbance; disease; trampling of vegetation and track formation by livestock or vehicles; negative environmental impacts of infrastructure development such as quarrying, road kills, and litter; alien and invasive species such as dogs, cats, and plants; and small populations and insularity associated with a small and fragmented environment.

Yabello Sanctuary *(visited 1 June).* Yabello Sanctuary was set up to afford protection to the endemic Swayne's Hartebeest. The sanctuary is located just east of Yabello town in the

Borana Zone and more than 500 kilometers from Addis Ababa. The Yabello-Arero road passes through the southern part of the sanctuary.

The altitude of most of the area is about 1,700 meters, although the broken topography varies between 1,430 and 2,000 meters. The area is notable for its red soils, which have little organic matter. The general vegetation type is *Acacia* savanna, the major trees being *A. drepanolobium* on black cotton soil and *A. brevispica* and *A. horrida* on the slopes. There are also patches of *Balanites aegyptiaca*, and several species of *Commiphora* and *Terminalia* are found at the lower altitudes. Although the higher parts of the hills were once covered with *Juniperus procera* and *Olea europaea cuspidata* forest, only a few patches remain. Most of the trees were logged for construction and other purposes. More than 280 species of birds have been recorded in the park, including 6 Ethiopian endemics. The sanctuary and is recognized as an important bird area by Birdlife International. The dominant land use is pastoralism, practiced by the Borana people (Birdlife International[12]).

We drove through Yabello Sanctuary without knowing we were there because of an error on one of our maps (the two maps showed the reserve on opposite sides of the road). Dik-diks and hares were very numerous. People with livestock were seen along the road.

Conservation issues. The precise boundaries for this protected area have not been established (Birdlife International). Although designated as part of the official protected-area system, very little has been done to develop the sanctuary's infrastructure, and it receives high levels of human use. All park staff lives 10 kilometers away in the town of Yabello. Responsibility for conservation of such areas now resides with the regional government; more attention must given to developing this area through collaboration among the regional and local bureaus and the local communities.

[12] http://www.birdlife.org/datazone/sites/index html?action=SitHTMDetails.asp&sid=6298&m=0.

IV. THREATS TO BIODIVERSITY AND TROPICAL FORESTS AND ACTIONS FOR CONSERVATION

Threats to Ethiopia's biodiversity, tropical forests, and resource base can be broadly linked to the following categories: limited governmental, institutional, and legal capacity; population growth; land degradation; weak management of protected areas; and deforestation. These threats are largely interrelated and self-reinforcing, whether they are direct (such as charcoal-driven deforestation) or indirect (such as limited governmental capacity as seen in the lack of enforcement of natural resource related policies). It is therefore important not only to understand the individual threats but also to examine them in a holistic fashion that recognizes their interrelation and to address these threats with a multisectoral approach.

This section describes threats to biodiversity and tropical forests and recommends mitigating actions. These actions could be implemented by a number of actors, including the government of Ethiopia, NGOs, international donors, research institutions, or community-based organizations. Specific recommendations for USAID are provided below.

A. Limited Governmental, Institutional, and Legal Capacity

The extent of degradation of Ethiopia's resource base and the open disregard for many natural resource-based policies demonstrates that the government of Ethiopia has been unable to ensure the protection and sustainable use of its biodiversity and forest assets. In general, there is quite a good framework for natural resource management in Ethiopia, and a number of established institutions monitor the environment. The EPA and the IBC are good examples of dynamic institutions involved with monitoring, legislation, and research in the sector. However, there is limited on-the-ground implementation of policy as well as marked limitations in stakeholder participation (McKee 2007).

Cattle grazing in Awash National Park

This gap between policy and implementation can be attributed to unclear, incomplete, and contradictory policies. Contradictions may arise from disagreements among different sectoral authorities managing the same resource or area, or they may occur when there are discrepancies between federal and regional policies. In one example, federal policy mandates conducting an EIA before federal and privately funded investments are approved. The investment policy, however, has approved investments without prior EIAs.

This disregard for federal policies may, in part, explain the lack of enforcement throughout the country—and which is most noticeable with regard to illegal encroachment within the

protected area system. On visits to national parks, we saw cattle, sheep, goats, camels, and donkeys—accompanied by herders and dogs—inside park boundaries apparently without the herder's being concerned about the legality of their movements. This is not surprising given that these parks have not yet been officially gazetted—which in itself represents a lack of capacity to manage the park system. In addition, we heard that, in many cases, conflicting agendas and political sensitivities (for example, not wanting to alienate a portion of the electorate during the run-up to the 2010 elections) led to the release of accused offenders and retribution against the game guards or wardens who had made the arrests. With disincentives for enforcement, a lack of official park boundaries, and no commitment by the government to control encroachment, people have no reason to curb their use of what has become an open access resource, to the detriment of the land base and wildlife.

When the government commits to undertake a program, it can do so quickly, with the compliance of the population. However, some of these programs have been implemented throughout the country without regard for high variances in the resource base and the relative potential for development. In one example, the Plan for Accelerated and Sustainable Development to End Poverty (the newly reorganized Poverty Reduction and Sustainable Development Program) mandates cereal production everywhere in the country. This program was designed quickly, without sufficient time for reflection or internal review; as a result, the program has been implemented in areas such as dense tropical montane forests and arid areas where cereal production is not viable. This lack of planning and appreciation of the variability of natural systems in Ethiopia has led to negative impacts on the environment through land clearing as well as poor use of the resource base.

Finally, the lack of secure use rights (including the right to exclude) or ownership over land gives people no incentive to manage the land sustainably, and indeed motivates them to get as much as they can while the opportunity lasts. It should be noted that, although cropland can now be registered under land tenure reforms, lands for other uses—such as grazing or forests—cannot. Traditional tenure systems are in places that regulate land use (with periods and places rested for use in dry season or for droughts), but a lack of secure use rights—for individuals or communities—over grazing and forest lands has confirmed open access status that is further stressed by population growth.

Actions for conservation. To address these threats, it is critical to raise the awareness of government decision makers responsible for forming and enforcing policies related to the importance of biodiversity and sustainable management of natural resources. Awareness is also important regarding the negative impacts of polices as a result of contradictions, lack of enforcement, lack of time for testing and verification of ideas, and the introduction of inappropriate technologies. With 85 percent of the population depending directly on the use of natural resources (primarily for agriculture and grazing), it is necessary to clarify the importance of carefully crafting policies and then ensuring their enforcement. To this end, civil society organizations that are dedicated to examining natural resource issues should be strengthened so they can have more direct and forceful voices within the government. It is also important to facilitate dialogue among the government, civil society organizations, and national and international organizations by creating discussion opportunities through meetings, workshops, and intersectoral working groups.

There is also a need to closely examine policies, particularly those needing clarification or harmonization. Such examination requires awareness of the gaps that exist and acknowledgement of the need to revisit the policies. Next, the policies must be examined and specific issues identified through workshops, trainings, or studies so that all the necessary information can be gathered and all of interested parties can be heard. Once the time has been taken to hear all voices and consider all information, gaps may be filled and the policy framework can be improved. Additionally, implementation texts for on-the-ground managers should be created to ensure that those charged with enforcing and managing policies at the local level understand their roles and the intentions of policy makers. These texts should make legislation—which is often necessarily complex—easily understood by managers and local populations to whom the policies will need to be explained.

B. Population Growth

Among the threats posed to biodiversity, forests, and natural resources in Ethiopia, population growth is the one that most directly drives and exacerbates the effects of the others. Population growth in Ethiopia is estimated at more than 2.2 percent per year, continually adding pressure to an already degraded resource base. With less land available per person, people are forced to farm or graze in more marginal areas, and areas that traditionally would have been left to recover must remain continually productive. Combined with a shortage of alternative livelihoods, population growth translates into greater pressure on the land and resources to provide for immediate human needs, thereby threatening the ultimate sustainability of the resource and the very existence of flora and fauna that depend on the same land increasingly used by humans.

Actions for conservation. Population growth poses many challenges for Ethiopia, and many organizations are working to help reduce its magnitude and mitigate its impacts. These efforts revolve primarily around family planning, which can most directly reduce pressure by decreasing or slowing the increase of the number of people depending on the resource base. Family planning efforts can involve education on the consequences of large families and family planning options as well as access to medical counseling and birth control.

Land around water source near Gewane

In addition to education and family planning, actions that promote alternate livelihood activities can help to mitigate and reduce pressure from a growing population. The vast majority of Ethiopians currently earn their livelihoods from agricultural and/or pastoral activities, so programs that can offer alternate livelihood strategies (tourism, services,

technology, commerce, etc.) can provide options that may not increase pressure on the degrading resource base. Along these lines, consideration should be given to developing hatcheries for fish production. Clean water from thermal springs, for example, could support the production a variety of fish and other aquatic organisms, such as frogs or crocodiles, for food or to supplement the native fisheries industry.

C. Land Degradation

Land degradation in Ethiopia takes many forms, and it is encouraged by population growth and limited governmental capacity, as discussed above. In some areas that the assessment team visited in the Afar and Oromiya regions, land was so degraded that its capacity to continue to provide grass for livestock or soil nutrients for farming seemed minimal. Nevertheless, evidence within enclosures and from discussions with local land managers showed that the land seemed resilient if allowed to rest. The primary source of land degradation in the pastoralist regions visited was overgrazing of livestock. This in turn leads to soil erosion in places where the stabilizing capacity of grasses is compromised, leading to siltation of water sources threatening their productivity for human and aquatic wildlife. Degraded land also allows invasive species to colonize or increase their presence in an area.

Invasive species such as *Prosopis juliflora* in the Awash region and *Acacia drepanolobium* in the Borana and Oromiya regions has spread because fire suppression has decreased the land's value for grazing. With fire suppression, woody species such as *Prosopis* and *Acacia* gain ground over grasses, which increase their growth after fire clears away the woody species. Additionally, both species are particularly resilient once established and must be dug out by the root so that they do not return—which requires enormous labor. Land "lost" to these species is difficult to regain, and eradication efforts may need to concede to an effort to merely control their spread.

***Prosopis* eradication efforts**

There is also a marked lack of nutrient cycling in the farm and grazing lands, which further degrades the resource and hampers its ability to recover productive capacity. As fodder and fuel become scarcer with land overused and the population increasing, crop residues (which would be left to enrich the soils in many cropping systems) are removed from farms to feed livestock. Additionally, in some areas where wood sources are not readily available, manure is gathered and dried for fuel, thereby removing a critical element that can return nutrients to the soil for the next crop cycle. Without replacing the natural nutrients of crop residues and manure, and with chemical additions too expensive and out of reach for many, farming may become more of an extractive than a sustainable endeavor, leaving lands no longer fit for crop production.

Actions for conservation. Most actions to ameliorate land degradation, particularly in the pastoralist areas, involve reducing the immediate pressure of grazing to allow for recovery and growth of the grasses. Efforts at reducing the density of livestock on the land can take many forms, including facilitating the marketing of livestock to convert livestock into cash, bank savings, or other assets (to act as a safety net during droughts, replacing cattle sold for poor prices in markets flooded with "drought cattle"); subsidizing intensive livestock operations in appropriate locations (to replace extensive low-efficiency methods); and otherwise encouraging a shift from traditional systems that have seen significant growth in both human and animal populations.

Efforts could also be made to manage rangelands more actively through the use of enclosures and rest periods. These methods are traditional in some areas, but they may need to be reinforced where increasing populations or changes in traditional lifestyles have caused them to break down. Additionally, the siting of water points—particularly high-maintenance boreholes—should be carefully evaluated. These water points have the potential to centralize large livestock populations that would traditionally have had greater range, and to decrease impact per area within that range. Instead, traditional water points that encourage more movement, and therefore, less impact on any one area, should be considered for rehabilitation and improvements. In some cases, land use patterns may be suboptimal, and it may make sense to relocate people to less sensitive areas with higher value for their livelihoods. Additionally, increasing the tenure and use rights of common grazing areas may encourage rational management of the resource by guaranteeing future benefits to those who forgo short-term gains

Efforts should be made to eradicate invasive species, if possible, and to control them in areas sensitive to biodiversity and where people depend on grazing for their livelihoods. Current methods for control, which include cutting, burning, digging up roots, and plucking seedlings, can be effective, although they come at a high cost in labor. Chemical or mechanical methods should be considered if they can prove more effective in removing or controlling invasives. Support should also be given to surveying the invasive species to map outlying locations (especially near protected areas) and treat them immediately to control expansion.

Endangered Ethiopian wolf with cattle in Bale Mountains National Park

Prosopis is an enemy to some but can be an opportunity for others; therefore, commercial opportunities and management should be investigated as alternative methods to control re-sprouting. Some work for the production of *Prosopis* charcoal has been supported by USAID, but, as discussed below in Section E, there are risks associated with doing so. Nevertheless, activities focusing on, for example, establishing community-based charcoal groups or providing credit facilities to improve efficiency in charcoal production can be beneficial to the land and communities as long as they are monitored and controlled.

D. Weak Management of Protected Areas

Protected areas in Ethiopia represent about 16 percent of the country and are critical habitats for the country's most endangered wildlife and biodiversity. Although officially protected, these areas are generally marked by weak management capacity and continually degraded landscapes. The principal causes of the weak management and degradation have been mentioned above in Sections IV-A (Limited Governmental, Institutional, and Legal Capacity) and IV-C (Land Degradation). Given the importance of zones to biodiversity and forest conservation in Ethiopia, they bear repeating with emphasis on the issues specific to protected areas.

The issues of encroachment are quite severe and may, in some national parks, call into question the status of protected area. In the Abijatta-Shalla Lakes National Park, for example, the increase in villages, farms, and cattle has necessitated transfer of non-avian wildlife in the park to a closed corral for their protection. In another case, herders and cattle were seen on the Sanetti Plateau in the Bale Mountains at more than 4,000 meters (13,125 feet) above sea level, where the nutritional value of the graze is minimal and vegetation in the high moist environment is prone to compaction and slow to grow and recover. This area is also a prime habitat for the highly endangered Ethiopian wolf; herders often bring dogs with them that may attack the wolves, spread rabies, and even interbreed with wolf populations. Without strong management, many parks have become *de facto* multiple-use, open access areas that are being degraded at an alarming rate. Although human use—and even settlements—are not inherently incompatible with protected areas, management and planning are necessary to mitigate their impacts and ensure that the resource base is used sustainably for both people and wildlife.

Part of the reason for weak management of protected areas is the lack of financial resources. In some cases, as in the Bale Mountains, park staff has created ambitious management plans for protection, to work with communities within and around the park, and to develop tourism. But these plans are underfunded, and large portions will remain unimplemented until financial resources are available. In many cases, requests for the authority and financing to properly manage parks are unfulfilled, leading educated and motivated staff to become discouraged and parks to go essentially unmanaged. Exacerbating the lack of financial investment in protected areas is the lack of clear authority for their management.

Although officially under a federal mandate, authority for the management for national parks has been ceded to regional authorities. Without national-level coordination and backing, the management of parks is uneven across the country. Areas and species of world importance are left to regional authorities that may be understaffed and unqualified to manage these critical resources. At the time of this writing, however, the federal unit in charge of wildlife had just been promoted to the level of a semiautonomous authority within the Ministry of Culture and Tourism in order to gain a greater measure of federal control over the park system. It is hoped that this move will improve the current situation, in which critical decisions over national park management are made without even consulting federal authorities.

Actions for conservation. Effective protection of protected areas should be a priority for expenditure of donor conservation funds, and the first action should be to have these areas—7 national parks, all of the 58 protected forests, 4 sanctuaries, and 8 reserves—officially gazetted. This action can form the basis of negotiations and outreach to the local communities. In itself, however, gazetting will not be enough, and the government must make a real commitment to enforcing the rules and boundaries of the parks, developing policies that are reasonable for both communities and conservation, and ensuring that these policies are implemented on the ground.

To go along with increased enforcement of rules and boundaries, efforts to strengthen the relationships among parks and communities will be necessary. To this end, training of park staff and outreach to communities should be undertaken. These efforts should go hand in hand, particularly regarding the development of community tourism. Park staff will need to understand the importance of ensuring that communities realize benefits from tourism, and communities will need to receive significant benefits from tourism that are directly related to conservation activities. Park staff can be trained via workshops and seminars that take place in-country, as well as regional or international forums that allow managers of different protected areas to discuss common problems and share approaches and solutions.

Furthermore, key development requirements for any protected area include an integrated water, grazing, and forest management and monitoring program; direction of revenue from the tourist industry to the wildlife/tourism authority and park management; involvement of local people in the development of parks; and controlled use of and access to forests and woodlands. Additionally, as wildlife knows no boundaries and "bigger is better" in terms of an area's ability to sustain viable populations, efforts should be made to investigate and support, where feasible, trans-boundary conservation/peace parks with Sudan, Kenya, and Eritrea.

With the responsibility for conservation of protected areas residing with the regional government, a coordinating link must exist between the federal and regional governments to ensure a consistent approach to management and conservation practices. More attention should be given to developing this area through collaboration among and participation by the regional and zonal bureaus and the local communities. Additionally, support for environmental education activities in communities around the protected areas also could help communities recognize the intrinsic value of protecting wildlife as well as the significant value of ecosystem services to the communities themselves. Recommendations for the support of community-based ecotourism, particularly in the pastoralist areas of Southeastern Ethiopia, are described in detail in the recommendations to USAID in Section V-B.

E. Deforestation

Of the total land area of Ethiopia, only 4 percent is covered with forests, with an estimated natural deforestation rate of 8 percent per year as of 2000 (World Resources Institute: Earth Trends: Forests, Grasslands, and Drylands 2003). The reasons for this deforestation are both direct—such as the production of charcoal and timber—and indirect—such as lack of management capacity and population pressures, as discussed above.

Particularly in the pastoralist areas visited by the assessment team, charcoal production seems to be one of the greatest drivers for deforestation. Although the tree cover for the area is rather sparse, charcoal could be seen sold in large quantities all along the route towards Djibouti (and elsewhere). Charcoal production is illegal, but its prevalence along the roadside showed that enforcement was lacking. Nevertheless, we saw a large confiscated shipment of charcoal, evidence that, at least in some cases, charcoal regulations were enforced.

Confiscated charcoal near Awash

This is not to say that all charcoal production is necessarily bad, since it may be produced in a sustainable fashion or utilize an invasive species such as *Prosopis*. Indeed, this was being done in the Afar region with the goal of turning a nuisance into a revenue stream. The major caution for such schemes is that they can encourage the overall production of charcoal (including use of protected species), and it is difficult to determine the wood source from the final charcoal product.

Protected forest species and areas also are threatened by unsustainable harvesting of trees and other forest products. In areas in the Oromiya region, for example, juniper forests—which are, in theory, protected—are exploited by local populations for fuel wood and construction. However, with no flexibility in the use of protected species and few alternatives to juniper wood, it would be unreasonable to expect the trees to be untouched. Nevertheless, with strong management and enforceable policies and sustainable use of alternate wood supplies, plans could be created to meet or reduce community needs. Other products such as the liana vine, wild spices, and medicinal plants, also are being overexploited.

Deforestation also occurs on land that is being cleared by increasing populations for agriculture. Additionally, with use rights being codified only for agricultural lands, forests may be cleared so agricultural use rights can be officially bestowed. Fires also present a threat to forests, whether they are set intentionally to clear land for agriculture, to encourage new grass growth, and kill woody species that are unfavorable for grazing (it is illegal to set a fire, despite traditions of using fire to manage grazing lands), or are driven naturally by fire suppression and frequent droughts, which set favorable conditions of dry and abundant fuel. Even if a fire is natural, once forest land is cleared, agriculturalists normally plant the area, thereby ensuring that the forest will not return to its former state.

Actions for conservation. To help slow or reverse deforestation in Ethiopia, it is important to raise the value of standing forests to people, show the benefits of sustainable timber harvest, or provide alternatives for forest products. To increase the value of standing forests, investments in expanding the market for NTFPs should be made. Among the high value products that are currently marketed (and that could be expanded) are honey and forest coffee. Additionally, several plants used for medicinal purposes could be valuable in local, regional, and perhaps international markets. Expanding markets for NTFPs will increase their value, giving people an economic incentive to protect the forests on which they depend.

The use of appropriate, energy-efficient stoves, and other technologies that can reduce use of fuel, should be supported to reduce deforestation and health problems related to indoor pollution. These stoves also can replace the use of dung as fuel, which can allow this important resource to be used to increase soil fertility and improve agricultural productivity. A particularly promising point of entry for improved technologies may be with commercial *injera* stoves. These stoves should be made locally, ensuring supply and synergistic economic development, and demonstrations should show the benefits (primarily savings in fuel expenses) to restaurants and wholesalers that produce large quantities of the staple.

To encourage the sustainable harvest of forest products, it is important that people have secure tenure or use rights. As discussed previously, current policies do not allow for such rights over forest areas; therefore, rational people have no incentive to use the resources sustainably and every reason to get as much as they can for short-term use. To help decrease the demand on natural forests, individual plots for wood and timber should be encouraged, allowing people to plant and harvest wood products according to their needs. Trees require a considerable investment in time and effort, however. Without secure use rights over the use of the mature product, people will not be willing to make the investment, limiting their tree plots to small areas near the homestead. Tree planting should be supported by local area nurseries, which have locally adapted native trees and shrubs (particularly those that can provide some NTFPs). These efforts, however, should operate in tandem with environmental education to also demonstrate the ecosystem and social value of forests.

Alternatively, commercial plantations could be expanded in areas with high production potential and low value for biodiversity. In many places, farmers use eucalyptus as a cash crop, and this practice should be expanded where possible. It is important to note that the selection of sites and species is critical for new plantations; popular tree species such as eucalyptus may not always adapt to local conditions and could pose threats such as overutilization of water resources, the release of allelopathic chemicals (threatening neighboring trees and crops), and the potential for invasiveness. There are currently separate USAID and European Union programs on land tenure reform, forest management, and marketing of non-timber forest products; by coordinating their efforts these programs could reinforce each other's goals and increase their impacts by. For example, the USAID land tenure program could work with the government to increase use rights over forests for communities; the European Union forestry project could help to support communities to

manage the newly secure resource; and their NTFP program could help to identify and market high-value products.

V. USAID/ETHIOPIA PROGRAMMING

USAID/Ethiopia's diverse portfolio includes current and planned natural resource management activities. Moreover, activities that are nominally unrelated to natural resources have many connections to conservation activities. This section discusses all USAID activities in the context of the actions necessary for conservation as described in Section IV. Additionally, this section recommends ways to further integrate conservation activities into current USAID/Ethiopia activities and illustrates activities to consider in planning.

A. Current and Planned USAID/Ethiopia Programming

The Fiscal Year 2008 Operational Plan for USAID/Ethiopia comprises five functional objectives: peace and security, governing justly and democratically, investing in people, economic growth, and humanitarian assistance. Each of these functional objectives is described below as it relates to biodiversity and forest conservation.

Peace and security. Conflicts in Africa are often driven by struggles to control natural resources, and conflict can in turn increase pressure on resources as, for example, refugees move into new areas where they must rely on natural products to survive. Working (or continuing to work) in volatile areas that are simultaneously important for biodiversity, such as Gambella and the Southern States, can help protect valuable resources threatened by conflict. Insofar as USAID's conflict mitigation is successful, there may be conservation benefits in avoided losses.

Governing justly and democratically. Working to improve the rule of law may benefit conservation by increasing the probability that natural resource laws may be enforced and that people charged with violations are fairly judged and sentenced. Work for good governance can help regional and local governments to be more responsive to the needs of communities, which often involves maintaining a healthy and productive resource base. Similarly, by strengthening civil society, the capacity of communities to organize and address their needs is improved. For conservation, this is particularly important for groups organized around the management of natural resources, such as water points or farmers' associations. Through the ELTAP program, USAID has been addressing the issue of land tenure and has been successful in improving the rights of people over agricultural land, a critical issue in encouraging sustainable use of land resources.

Investing in people. Next to economic growth, investing in people has perhaps the greatest number of connections to conservation, and there are many linkages between the two objectives. The most important connection is USAID's work in family planning. As discussed in Section IV, family planning can reduce the threat of population growth, which in turn drives many other threats to biodiversity and forests in Ethiopia. By investing in education and building the capacity of teachers and schools to deliver equitable and high-quality education, efforts at family planning and science education (including environmental sciences) can be improved to the benefit of conservation.

Programs aimed at protecting food security and vulnerable populations can aid conservation efforts by reducing pressure on natural resources at precisely the time they may be most vulnerable, such as stressed grasslands in times of drought. Additionally, when these programs offer food-for-work programs that are aimed, in part, at watershed management, as is the case in USAID's contributions to the Productive Safety Net Program (PSNP), there are direct benefits to conservation by improving habitats and reducing siltation and erosion into rivers.

Economic growth. Economic growth is the objective that most directly affects the environment; as such, this was the focus of the assessment team. Through work in improving the productivity of agriculture, USAID programs help decrease low-yield extensive agriculture and herding, which must be supported by a larger resource. Through programs such as the PLI, Microfinance to Markets, and the Agribusiness and Trade Expansion Program, USAID works to strengthen farm enterprises, industry associations, and value chains in such commodities as coffee, oilseeds, and hides and skins, which provide alternative livelihood options and help to reduce the number of agriculturalists and pastoralists depending directly on the land.

PSNP, with elements in the objectives of investing in people and economic growth, works in soil and water conservation through food-for-work tree-planting projects to protect critical watersheds. Not only does watershed protection and rehabilitation reduce erosion and siltation for healthier rivers, it also provides economic and health benefits for the many people who depend on the water source. Furthermore, the PLI program increases the grazing value of land through efforts to control or eradicate invasive species such as *Prosopis juliflora* and *Acacia drepanolobium* and improve pasture by maintaining enclosures. Bringing more land under productive value from the current degraded state can help to reduce the total area needed to maintain cattle populations (as land is allowed to recover and remain productive) or to be cleared and maintained for agriculture.

In addition to these improved natural resource management practices, USAID is in the initial stages of designing an ecotourism program under the Leader with Associates mechanism. Specific recommendations for this program will be given below. Insofar as this program can generate tourism revenues for conservation and communities in areas important to biodiversity, it has the potential to have significant conservation value.

Humanitarian assistance. In supporting disaster readiness, USAID has helped Ethiopia to improve its capacity to predict and respond to disasters—principally drought and famine—to which parts of the country are prone. Especially through the FEWS Net program, USAID is helping to predict and plan ways to decrease the use of natural products during times of economic and food distress, when people tend to increasingly depend on these resources for survival. This is particularly important because, at such times, focus on conservation and sustainable use of the products becomes secondary to day-to-day survival.

B. USAID/Ethiopia Conservation Actions and Recommendations

Categorized by functional objective, the section below describes actions that we recommend that USAID incorporate into current and future programs.[13] These recommendations include actions that USAID has yet to take as well as others that are currently being undertaken but which could be scaled up. Because general actions for conservation are described in Section IV, and current USAID actions in Section V-A, the following recommendations are program- and location-specific. If the theory by which actions will lead to conservation objectives was previously described, it is not repeated here. This section presents recommendations by program area, with detail provided for those programs most relevant to biodiversity. Annex A is a table of recommendations for each current USAID/Ethiopia program.

Peace and security. Although programs under this objective may not directly relate to conservation, it is recommended that USAID acknowledge that conflicts are often driven by use of resources and exacerbated by unclear use rights. In volatile areas that are simultaneously important for biodiversity—such as Gambella and the Southern States—helping to clarify land use rights can reduce conflict while benefiting conservation by decreasing the potential for refugees and increasing incentives for natural resource management.

Governing justly and democratically. In strengthening civil society organizations, it is recommended that USAID focus on groups involved in natural resource issues such as community-based organizations established with support from a European Union-funded forestry project in Southwest Ethiopia where farmers established nonprofit and marketing organizations. These organizations perform conservation and marketing activities and have formed a district-level network to engage in policy dialogue. Additionally, where feasible, these activities should take place around important protected areas such as Simien or Bale Mountains National Parks.

For programs strengthening the rule of law, USAID should support efforts to clarify natural resource policies (such as the process requiring EIAs), strengthen enforcement of protected area policies (particularly illegal encroachment), and clarify the roles and relationships of federal and regional authorities in managing national parks. This can be implemented by holding workshops where policy makers can examine the contradictions in the laws and resolutions, building capacity for protected area managers through trainings, or sponsoring individuals to attend forums such as the U.S. Department of Agriculture Forest Service International Program for Protected Area Management.

Finally, work in governing justly should continue to address the issues of land tenure—as is being done with ELTAP—to strengthen the application of tenure reforms for more than recognizing use rights for farmland to include community-based organization's recognition of use for forest and grazing lands.

[13] These recommendations are to a significant degree driven by the assessment team's interviews and field visits. As such, the most detailed recommendations are provided for the economic growth activities in southeast Ethiopia that were the focus of the team's investigations and to which USAID/Ethiopia's portfolio generally have the clearest and most direct connections to biodiversity concerns.

Investing in people. For education programs, USAID should help to ensure that the environment is covered in basic education. It also should help to emphasize the links between the environment, health (clean water and pollution), and the economy (sustainable management for long-term returns). Furthermore, USAID could sponsor biodiversity-themed events at schools (for example, NTFP days) and support local environment clubs and student visits to protected areas to see wildlife.

Additionally, when USAID builds health centers or works with communities on health or education issues, priority should be given to important biodiversity areas such as protected areas with endangered wildlife. Work with these communities for health issues should address environmental health and should be linked to conservation efforts so people associate the benefits brought by health activities to conservation or understand that priority was given to a certain community because of the government's commitment to protecting the environment.

Economic growth. Economic growth activities have numerous and direct connections to conservation activities. Therefore, these activities were the focus of the assessment team's site visits. The recommendations presented below are the most specific and extensive of the five functional objectives of USAID/Ethiopia.

For agriculture and microfinance programs, such as the current Agribusiness and Trade Expansion Program and the anticipated Microfinance to Markets programs, USAID should consider supporting non-timber forest products such as honey, forest coffee, spices, and medicinal plants. Markets currently exist for these products, but they all require a strengthening of their value chains as well as financing at the local level to expand supply, demand, and revenues to incentivize the protection of the forests upon which they rely. Activities supported by both of these projects—including potential support for NTFPs—carry risks of overexploitation and pollution or impacts from processing (especially if new facilities are constructed). It is therefore further recommended that the mission ensure all major activities are screened with a rigorous process as required by Regulation 216.

Working on soil and water conservation, the Productive Safety Net Program has important conservation objectives and outcomes. A highly visible government of Ethiopia program with multidonor support, PSNP has several features in place to ensure effective and environmentally sensitive implementation including a detailed implementation manual, an environmental and social management framework, and semiannual donor field reviews of the program. According to most recent reviews, the program has been continually improving and has acceptable level of beneficiary community participation in planning.

Nonetheless, the assessment team repeatedly heard serious critiques of the program which is important for USAID to be continually aware of. Although these critiques may no longer be relevant to the present current implementation of the program, they are widely believed given the long history of food-for-work programs in Ethiopia, which have been widely regarded as unsuccessful.

Much of the criticism has centered on the lack of community involvement in planning and ownership of the process, which in this case is the planting of trees to stabilize watersheds. While the program seems to have addressed the issue of participation in PSNP planning, the lack of community or individual ownership of the watershed areas, and therefore the trees themselves, has reportedly led to poor follow-up or maintenance and high seedling mortality. To address this issue, one recommendation is to expand the scope of these watershed programs to include private land or registered, communally owned lands to provide incentives for people to see trees survive, as they will be guaranteed benefits from secure use rights.

Many elements of the Pastoralist Livelihoods Initiative program include conservation benefits. With the number of implanting partners and intervention sites, however, the approaches are varied. To have an impact on the environment, we recommend that certain of these activities be emphasized in the next phase of the program. As discussed in Section IV-C, the issue of traditional versus modern water points powered by boreholes is critical for impact on the resource base. Although traditional water points keep cattle on the move and spreads impact at a lower, more sustainable, level over a greater area, modern fixed water points in villages near major roads tend to concentrate cattle settlements in unsustainable numbers that degrade the resource base. Therefore, it is recommended that the support of traditional water points for cattle—provided they are in or near protected or important biodiversity areas—be increased, while the use of modern boreholes be carefully considered for their impact on the carrying capacity of the area before being undertaken.

Additionally, efforts to improve range management and controlling invasive species should be scaled up. Efforts to thin *Acacia drepanolobium* near Yabello seemed quite promising; however, although they were quite extensive, they were still a drop in the bucket compared to the amount of overgrazed land. Furthermore, efforts to clear land of *Prosopis juliflora* in the Afar region were commendable but were limited in scope and represented an enormous expenditure of labor. In a village south of Gewane, with the support of PLI, the community cleared 10 hectares of *Prosopis* with hand tools over the course of six years, but *Prosopis* returned to areas cleared as recently as one month earlier. Given the tremendous investment in labor and the relatively small amount of recaptured land, we recommend that efforts be scaled up and alternate methods be investigated to increase the efficiency of the process. To this end, the Ethiopian Agricultural Research Institute is investigating alternative treatments, but at present, no method or product to control *Prosopis* has been identified.

Despite the serious threat posed by *Prosopis*, the shrub has highly marketable uses. Its seeds can be ground and used as fodder and its wood is desirable for furniture, charcoal, and construction. Indeed, communities in the Afar región already use the tree for construction, fuel, and fencing.[14] We also recommend increasing activities under the alternative livelihoods component of PLI, which can provide options to help to move people out of the livestock sector in overgrazed areas. One such option would be work with *Prosopis,* which, if managed, can provide a number of alternative economic activities.

[14] A full description of the plant and its uses is provided at http://www hort.purdue.edu/newcrop/duke_energy/Prosopis_juliflora html.

Although this was done to a limited extent to produce charcoal, the activity was ended because all charcoal was declared illegal. (Previously, using *Prosopis* for charcoal was legal, but this posed difficulties in regulating the source of the charcoal and encouraged the practice of charcoal making which affected protected species as well.)

Other alternative activities, such as supporting small enterprises and facilitating the marketing of cattle (as opposed to guarding them as wealth), help to reduce pressure on the land and should be expanded as well. Finally, PLI could better coordinate partners within the program as well as other actors in the livestock sector. This would aid management of rangelands on a larger scale and allow best practices in range improvement and alternative livelihood generation to be more easily spread.

With the development of an ecotourism program, USAID has undertaken a key action to aid conservation of biodiversity and forests in Ethiopia. In general, the most important aspect of conservation is ensuring that economic returns to local communities at least compensate for the forgone benefits and be linked to conservation. This can occur through the generation of employment in the park and support industries, such as hotels and crafts, or by improving land rights so direct benefits from tourism and wildlife (especially high-value benefits such as those associated with hunting) are paid to communities. Furthermore, USAID should support new initiatives such as the Ethiopian Forum for Community-Based Tourism, which could offer the opportunity for quick impact and leveraging of private and other donor funds in support of ecotourism development goals.

In addition, it is necessary to protect and improve wildlife and flora populations in the short term so tourists are attracted in the first place. Finally, infrastructure must be improved so tourists have a pleasant and memorable experience and will promote Ethiopia through word of mouth. With limited resources from the government and the potential for generating revenues, the privatization of park lodges—as well as other public-private partnerships—should be supported. Once the three elements of revenues, wildlife, and infrastructure are in place, community-based ecotourism should be able to meet the twin goals of conservation and rural economic development.

With the USAID focus on the pastoralist areas in the southeast, the assessment team conducted field visits in that region and had the opportunity to evaluate ecotourism potential in that area. Although the USAID program is open to the entire country, with areas to be defined by the design team, we found sufficient evidence to recommend further examination of the region as a potential site for an ecotourism intervention. To market the ecotourism package in this region of Ethiopia, links should be developed to other regions that currently have more developed tourism and attractive natural assets. The two obvious areas for linkages would be to historical tourism and religious sites in the north and cultural tourism and indigenous people in the southwest. The southeast also has high-value ecotourism assets of its own, with endemic species such as the Ethiopian wolf and the mountain nyala; other attractive species such as oryx, kudu, and lions; numerous endemic bird species; and dramatic landscapes.

Of the national parks in the region, Bale Mountains Park seems to hold the most potential to anchor an ecotourism program, and the team leader of the Ethiopian Wildlife

Conservation and Utilization Organization (the governmental organization charged with the management of the National Park System) cited the park as one of the top two sites in the country for ecotourism development. Submitted as a World Heritage Site in 2008, home to the largest population of the endangered Ethiopian wolf and mountain Nyala, and site of headwaters for 40 streams that create 4 major rivers, it is critical to protect Bale Mountains Park from a global conservation standpoint as well as for regional ecosystem services. From a practical standpoint, several key elements are in place that make the park attractive for ecotourism investments.

First, a 2007 management plan with a community-based tourism component is in place, although the plan needs funding to implement. Second, conservation NGOs have a presence in the park, including the Frankfurt Zoological Society and the Ethiopian Wolf Conservation Fund. A program could leverage support and funding by working with these organizations. The German Agency for Technical Development also is working in the region (although not the park itself) to develop trekking tourism in the Bale Mountains. Finally, although much of it is in poor condition, infrastructure is in place that can easily be rehabilitated without starting from scratch. For example, although the main lodge has been without power or water for several years, the structure is in good shape, and the road leading to the park is undergoing a major rehabilitation that will decrease travel time from Addis Ababa and points west by about five hours.

One immediate action that USAID could undertake under an ecotourism program would be to help implement the community-based tourism component and other elements of the Bale Mountains National Park Management Plan (see Section III-F and the Management Plan given to USAID). Selected elements for support include:

- Strengthening participatory skills of park staff
- Conducting natural resource inventories
- Developing sustainable utilization of NTFPs
- Creating a marketing plan to improve tourism potential
- Improving facilities, services, and activities
- Conducting training and awareness building with stakeholders and tourism providers
- Developing and marketing local crafts
- Assisting in track/trail development, signage, and interpretation
- Facilitating the establishment of nursery and fuelwood plots for community-based organizations
- Helping park residents and neighboring communities to obtain fuel-efficient stoves

Plans to negotiate with residents within the park to either relocate or redraw boundaries are included in the plan and are underway. These efforts are particularly critical for the future of conservation in the park as well as the success of tourism endeavors, which will require the goodwill of communities to succeed. It is therefore critical for such efforts to be facilitated and supported to ensure rational management decisions and community buy-in to future programs.

Humanitarian assistance. Longstanding humanitarian assistance efforts in Ethiopia help to reduce pressure on the resource base in times of crisis. In addition to direct food aid, programs like the FEWS Net help to increase the capacity of the United States and the government of Ethiopia to respond. These programs, however, are not always integrated, and although reports are produced and shared, other Ethiopian and U.S. programs may not benefit from critical analysis. It is therefore recommended that the modeling and analysis efforts of programs such as FEWS Net be more broadly publicized and made available to on-the-ground organizations such as PLI, which can use the information to plan and implement emergency and livelihoods activities in the areas where they are most critical.

VI. CONCLUSIONS

With the second-largest population in sub-Saharan Africa and with a highly variable climate and landscape, Ethiopia faces many serious challenges to efforts for the conservation of its biodiversity and forests. With rare and endangered species of mammals, high rates of endemism of bird populations, and the largest Afroalpine habitat on the continent, the success of these efforts is critical. USAID, with a strong presence and diverse portfolio in the country, is well placed to help with these efforts through direct activities, such as ecotourism, as well as through indirect efforts to strengthen the rule of law or expand alternative livelihood opportunities in rural areas.

There are, however, critical areas that must be addressed by USAID, the government of Ethiopia, and other development partners if conservation efforts are to be successful. Of the many threats and actions described in this report, the following three points may best distill the most critical of the challenges and point the way to broad actions to allow for specific interventions to meet conservation objectives.

Without clear tenure—ownership and/or use rights—land degradation will likely continue. Whether granted in the form of ownership or guaranteed rights of use and exclusion, land rights are critical to motivate people to use the resource base sustainably and rather than over-utilizing it for short-term gains. Privatization of land is a sensitive issue in Ethiopia, but current trends of granting increasing use rights have received positive feedback. These trends, however, still need to be supported, and land rights need to be expanded to include grazing and forest areas if they are to remain viable for conservation and sustainable resource use.

With the dependence of Ethiopia on natural resources, conservation must be a top government commitment. With an estimated 85 percent of the population dependent directly on the land for their livelihoods, and with increasing trends toward and acknowledgement of land degradation in Ethiopia, it is critical that conservation become a top commitment of the government of Ethiopia. Although there is an extensive and progressive framework of policies and agencies, management of natural resources is continually hampered by unclear and contradictory policies, a lack of clear authority between regional and federal bodies, and poor enforcement. With the firm commitment of the government, these issues can be addressed; however, as long as people feel that policies are on paper only, they will never realize their objectives. With the recent re-elevation of the Wildlife Conservation Organization to an autonomous authority under the Ministry of Tourism and Culture, the federal government has shown signs of taking conservation more seriously. This development must be supported if degradation of the land and biological systems is to be reversed.

Communities need direct economic returns to support protected areas and conservation programs. Without revenues from conservation activities equal to or greater than forgone benefits from previously utilized resources (whether decreased use or a complete cessation of use), local support for conservation activities will be unattainable or short-lived. However, programs with clear and substantial returns from conservation activities should

be successful and sustainable as communities will support them. Whether through ecotourism, pastureland improvements, or watershed protection, the same principle is critical: Revenues need to be sufficient (although not necessarily cash) and tied directly to conservation.

With five functional objectives and through large investments in Ethiopia programming, USAID has shown its commitment to the development of this strategically important country. For these efforts to reach their long-term objectives and be sustainable, however, it is critical that threats to the natural resources be addressed with conservation actions. Otherwise, all of the investments risk being trumped by the degradation of the base on which the population depends to survive.

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ANNEX A. USAID/ETHIOPIA RECOMMENDATIONS

Table 6. Recommendations by USAID Ethiopia Activity

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
Assets and Livelihoods in Transition			
Catholic Relief Service (CRS)	Catholic Relief Service	Provide care and support to orphans and vulnerable children and expanded palliative care to PLWHAs, (objective under DA/DAP: address the immediate humanitarian needs of 45,000 of the poorest of the poor in 15 urban and semi-urban areas throughout Ethiopia	Incorporate environmental education into basic education elements, emphasizing links between environment and health (especially clean water and pollution issues).
DAP World Vision	World Vision	Reduce risk and mitigate impact of HIV/AIDS through nutrition activities, prevention, care and support, advocacy, and partnership with faith-based organizations and staff capacity building.	Nutrition and capacity building activities can work with target groups for sustainable alternative livelihood activities (e.g., crafts or non-timber forest products such as forest coffee/honey, spices, and medicinal plants).
Livelihoods Integration Unit (LIU)	The Food Economy Group	A key objective of the LIU is the full integration of livelihoods-based analysis of the national early warning system, with a view to strengthening the DPPA's ability to anticipate and manage shocks.	Integrate FEWS information into USAID and other donor programs for improved land-use planning and more effective targeting of pastoralist area activities.
PEPFAR Orphan Vulnerable Children Program	Relief Society of Tigray (REST)	Reduce the impact of HIV/AIDS on children orphaned by HIV/AIDS in Werie Leke, Mereb Leke, Ahferom, Dugea Temben, Wukro, and Raya Azebo woredas of Tigray region.	Incorporate environmental education into basic education elements, emphasizing links between environment and health (especially clean water and pollution issues).
PSNP: Intensification of the Generating Employment and Building Independence Program	Community Habitat and Finance	Diversified and expanded livelihood options for beneficiaries in the seven food insecure woredas and improved capacity of woreda and regional government and community associations and cooperatives to develop and implement sustainable strategies	Continue to focus on community involvement in planning, especially in the case of tree planting to stabilize watersheds to increase seedling survival. Focus on planting sites with secure tenure, either for individuals or communities, to help with maintenance and seedling survival. To address this issue, the exists potential to expand the scope of the watershed program to include private land or registered communally owned lands. Carrying capacity of land—especially in drought conditions—should be considered when providing small ungulates to families in return for labor on community projects. Integrate FEWS information for improved land-use planning
PSNP: Pilot Productive Safety Net Program	Save the Children Federation Inc.	Decrease the number of persistently poor requiring food or cash assistance to meet basic needs through community asset creation and household asset protection.	
PSNP: Productive Safety Net Program—CARE	CARE International	Decrease the number of persistently poor requiring food or cash assistance to meet basic needs through community asset creation and household asset protection.	

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
PSNP: Productive Safety Net Program—CRS	Catholic Relief Services	Decrease the number of persistently poor requiring food or cash assistance to meet basic needs through community asset creation and household assets protection.	and more effective targeting of programs, especially those aimed at drought prone areas.
PSNP: Productive Safety Net Program—FHI	Food for the Hungry International	• Enhance the livelihood capacities of the target population to strengthen resiliency to withstand shocks. • Protect the livelihoods of the chronically food insecure through the provision of food transfer.	
PSNP: Productive Safety Net Program—REST	Relief Society of Tigray	Make a sustained change to the food security and livelihoods of chronically poor communities in central, eastern, and southern Tigray and reduce their vulnerability to disaster shocks.	
PSNP: Productive Safety Net Program—World Vision	World Vision	Decrease the number of persistently poor requiring food or cash assistance to meet basic needs through community asset creation and household asset protection.	
PSNP: Productive Safety Net Program (PSNP)—SC/UK	Save the Children UK	Decrease the number of persistently poor requiring food or cash assistance to meet basic needs through community asset creation and household asset protection.	
PSNP: Protracted Relief and Recovery Operation	World Food Program	PSNP: Decrease the number of persistently poor requiring food or cash assistance to meet basic needs through community asset creation and household asset protection. Relief: General food distribution and food for work (for food-insecure.	
PSNP: Support to Productive Safety Net Program—CARE	Care International in Ethiopia	Decrease the number of chronically poor women, men, and children in six woredas requiring food and cash assistance to meet basic needs through diversifying and expanding household assets and enable the households to graduate from the PSNP.	
PSNP: Support to Productive Safety Net Program—CRS	Catholic Relief Services	Strengthen and diversify livelihoods of 21,073 chronically food-insecure households (123,710 total beneficiaries) in the six targeted PSNP woredas. Increase the capacity of the government of Ethiopia.	
PSNP: Support to Productive Safety Net	Food for the Hungry	Increase and diversify the community's livelihood options and build the capacity of the woreda and its	

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
Program—FHI	International	partners to implement the PSNP.	
PSNP: Support to Productive Safety Net Program—REST	Relief Society of Tigray	Reduce the number of persistently poor people requiring food/cash assistance to meet basic needs in drought-prone woredas by expanding and diversifying livelihood options for households in the target communities, promoting market-led economic growth.	
PSNP: Support to Productive Safety Net Program—SC/UK	Save the Children UK	Reduce dependence on external assistance and improve resiliency of the chronically food insecure households through diversifying their livelihood options in Sekota, Gubalafto, Habru, and Dehana woredas of Amhara region.	
PSNP: Support to Productive Safety Net Program—WV	World Vision	Decrease the number of persistent poor requiring food or cash assistance to meet their basic needs in two woredas of SNNPR through expansion and diversification of household livelihood options and strengthening the woreda capacity for program implement.	
PSNP: Support to Productive Safety Nets Program—SC/US	Save the Children Federation Inc.	Strengthen pastoral livelihood diversification activities for vulnerable pastoralist groups in the three woredas of Somali region and improve emergency response capacity of the three woredas.	
Business, Environment, Agriculture and Trade			
African Growth and Opportunities Act (AGOA+)	VEGA—IESC	Increase AGOA-led exports to the United States and private sector capacity building resulting in SME-based, export-led job creation.	Examine the potential of environmental grades, standards, and certification (such as organics, fair-trade, and coffee-specific standards) that allow entry into high- value niche markets in the United States.
Amhara Regional Food Security (AMAREW)	Virginia Tech University, Cornell University	Strengthen agricultural research, extension, watershed management, and micro-enterprise development to enhance food security.	Emphasize drought-resistant crops to reduce pressure in drought periods and mitigate potential pollution
Development Credit Authority (DCA)	Awash, Dashen and Abyssinia Banks	Improve access to short- and medium-term credit for agribusiness and other selected small and medium enterprises.	Examine the potential of environmental grades, standards, and certification (such as organics, fair-trade, and EurepGAP) that allow entry into high-value niche markets in the United States and Europe.

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
Ethiopia Strategy Support Program	International Food Policy Research Institute	• Generate policy research results to fill key knowledge gaps • Build a stronger and more integrated knowledge support system • Generate policy research results to fill key knowledge gaps • Build a stronger and more integrated knowledge support system	Examine the potential of environmental grades, standards, and certification (such as organics, fair-trade, and EurepGAP) that allow entry into high-value niche markets in the United States and Europe, and the potential benefits in running environmentally friendly businesses as well as the potential for negative impacts for those production methods which do not sufficiently consider environmental concerns (pollution from runoff, land clearing, etc.).
Ethiopian Agribusiness and Trade Expansion Program	Fintrac Inc	To increase export, regional and local sales by $450 million in three years.	Support non-timber forest products such as honey, forest coffee, spices, and medicinal plants. Examine the potential of environmental grades, standards, and certification (such as organics, fair-trade, and EurepGAP) for targeted commodities.
Ethiopian Dairy Development Project	Land O'Lakes	Develop a market-driven, private sector-led Ethiopian dairy industry built on private investment that generates employment and income for smallholder families.	Support intensification of livestock and improved pasture management techniques (especially with burning and fallows) to reduce the impact on the resource base.
Ethiopian Sanitary and Phyto-sanitary Standards and Livestock Meat Marketing	Texas Agricultural Experiment Station of Texas A&M	• Improve the capacity of Ethiopian veterinary services to undertake sanitary phytosanitary standards and related activities in support of increased livestock and meat exports • Improve Ethiopia's capacity and competitive advantage for meat and livestock	Facilitate marketing of livestock to reduce the length of time livestock is on the land.
Ethiopian Sheep and Goat Productivity Improvement Program (ESGPIP)	Prairie View Research Foundation of Prairie View A	• Improve small ruminant (sheep and goat) health, production, and marketing practices • Introduce adaptation and transfer of technologies available to prepare improved nutritious feed for small ruminants using locally available feed resources	Facilitate marketing of livestock to reduce the length of time livestock is on the land.
MASHAV Technical Support	MASHAV	Transfer new and improved agricultural technology in the areas of fruit tree and biotechnology, water, and irrigation development and dairy production.	Ensure impacts associated with irrigation development and introduction of biotech products are properly screened. Help build capacity of agro-industries to implement chain of custody procedures critical to international grades, standards, and certifications.
PLI: ACDI/VOCA Pastoral Livelihoods Initiative—PLI	ACDI/VOCA	Transform pastoralist livestock marketing system through improved terms of trade for pastoralists and overall increased sales to domestic and export markets.	Support traditional water points—provided they are in or near protected or important biodiversity areas—while the use of modern boreholes for cattle be carefully considered for their impact on the carrying capacity of the area before being

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
PLI: CARE Pastoral Livelihoods Initiative—PLI	CARE	Support pastoralists to improve household livelihood security and maintain assets during drought cycles.	undertaken. Efforts at improving range management and controlling invasive species should be scaled up and alternate methods be investigated (in partnership with Ethiopian Agricultural Research Institute) to increase the efficiency of the process. Support efforts to take advantage of highly marketable *Prosopis* in uses such as ground seeds as fodder and wood for furniture, charcoal, construction, fuel, and fencing. Expand efforts to facilitate the marketing of cattle to help reduce the pressure on the land. Increase coordination of partners within the program, as well as other actors in the livestock sector, especially FEWS Net, to aid management of rangelands on a larger scale, better target high priority areas for interventions, and allow best practices in range improvement and alternative livelihood generation to be more easily spread.
PLI: International Rescue Committee-IRC Pastoral Livelihoods Initiative—PLI.	IRC	Improve livelihoods of pastoralists. Strengthen capacity, maximizing market opportunities for pastoral communities and strengthen community-based animal health care services in targeted areas.	
PLI: Regional Capacity Building	MoRAD,MoFA	Increase the capacity of the regional livestock bureaus and two livestock-related ministries to monitor pastoralist conditions and activities, train government staff and pastoralists, address pastoralist challenges, and generally support pastoralist livelihoods.	
PLI: SC/UK Pastoral Livelihoods Initiative—PLI	SC/UK	Strengthen capacity of Somali Regional States and Afar Regional States DPPB/FSB. Establish and manage region-wide district-based pastoral early warning system linked to early warning responses.	
PLI: SC/US Pastoral Livelihoods Initiative—PLI	SC/US, Pastoral Concern Association of Ethiopia	Mitigate the impact of drought and other shocks by sustainably improving preparedness, livelihoods, and incomes of pastoralists.	
PLI: Tufts University	Tufts University	Ensure technical coordination of PLI activities and systematic monitoring, impact assessment, and research to inform policy development and best-practice guidelines in livestock developmental relief in pastoralist regions.	
Southern Tier Initiative. Livelihood Enhancement for Agro-pastoralist and Pastoralists	SC/US (ACDI/VOCA, CARE	Improve livelihoods of 78,000 households representing 50 percent of pastoralists and agro-pastoralists from 12 woredas.	
Strengthening Land Tenure and Administration	Associates in Rural Development (ARD)	Assist the government of Ethiopia to implement a sound land certification and administration system that enhances land tenure security.	Strengthen the application of tenure reforms for more than recognizing use rights for farmland to include community-based organizations' recognition of use for forest and grazing lands.

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
Basic Education Services			
Transforming Education for Adults and Children in the Hinterlands	U.S. PACT	Increase the educational attainment of children and adults in disadvantaged areas and improve the capacity of Woreda Education Officesin managing non-formal education programs.	Ensure that the environment is addressed in basic education and emphasize the links between the environment, health (clean water and pollution), and the economy (sustainable management for long-term returns). Sponsor biodiversity-themed events at schools (for example, NTFP days) and support local environment clubs and visits to protected areas to see wildlife.
Democracy and Governance			
Constructive Dialogue Initiative (Promoting Democratization and Stability in Post-Election Ethiopia)	PACT Ethiopia	• Increased effectiveness of conflict management policies and practices, emphasizing government-civil society partnerships • Enhanced government-civil society collaboration in democratic governance processes	Through engagement with civil society organizations, USAID can select groups organized around the management of natural resources, such as water points or farmers' associations to strengthen their capacity of communities to organize and address their needs with environmental benefits of better natural resource management.
Envisioning Ethiopia	IFES	• Support Ethiopia's democratic development through sustained and inclusive national dialogue • Assist Ethiopian civil society in envisioning what the country will look like in 2020 and how to achieve those outcomes	Ensure that the environment is included in the national-level dialogue and future planning. Plans for national-level priorities, especially in the agriculture sector, need to consider environmental sustainability, which will protect the resources base upon which so much of the population depends, for future generations.
Ethiopia CityLinks Program	International City/Country management Association	Enhance Good Governance in Adama and Dire Dawa Cities and Gambella and Somalia Regional States through: • Improved government planning and management of service delivery and economic growth projects • More effective citizen participation	Through engagement with civil society organizations, USAID can select groups organized around the management of natural resources, such as water point or farmers' associations, to strengthen the capacity of communities to organize and address their needs with environmental benefits of better natural resource management.
Human Rights Advocacy and Training	JFA-PFE	Deter human rights abuses through: • Training for federal and regional court and police officials in international, national human rights law and institutional administrative regulations • General and case specific advocacy targeted at national and regional levels	Not applicable

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
Local Election Support Program	CEPPS II	• Improved political party capacity to prepare for and participate in the 2008 Ethiopian local elections • Increased capacity of civil society organizations to plan for and engage in observation of the 2008 Ethiopian local elections	Through engagement with civil society organizations, USAID can select groups organized around the management of natural resources, such as water point or farmers' associations, to strengthen the capacity of communities to organize and address their needs with environmental benefits of better natural resource management. Support political parties in raising the environment as one of the main issues during campaigning.
Promoting Judicial Independence in Ethiopia	Freedom House	• Improve capacity of Ethiopian law schools to provide quality legal education • Improve capacity of Ethiopian government training centers to provide quality pre- and in-service training for judges	Ensure that environmental issues are well understood, and the legal framework is consistent so cases involving environmental issues (protected area encroachment, illegal timber harvest, etc.) may be fairly heard and people understand which activities are and are not legal.
Restoration of Community Stability in Gambella	PACT Ethiopia	• Support community-led peace processes and peace agreement consolidation activities • Strengthen government and civil society capacity and partnership to manage conflict	Where there is the opportunity, stability work should be pursued in areas that are also important for biodiversity, including the Boma-Omo-Gambella cross- border ecosystem between Sudan and Ethiopia. Helping to clarify land use rights can reduce conflict while benefiting conservation by decreasing the potential for refugees and increasing incentives for natural resource management.
Health, AIDS, Population and Nutrition			
Contraceptive Procurement	Central Contraceptive Procurement	Ensure access to and availability of modern contraceptives through the procurement of contraceptives for the Pathfinder family service delivery network in public- and private-sector clinic	Priority for contraceptive activities should be given to important biodiversity areas, such as protected areas with endangered wildlife, which are simultaneously in need of health services.
Fistula Prevention and Repair	Addis Ababa Fistula Hospital	Prevent and treat obstetric fistula in Ethiopia	Not applicable
Improving the Logistics System/DELIVERII	John Snow Inc.	Improve management of essential contraceptives throughout Ethiopia by strengthening the contraceptive logistics system and build an integrated health logistics system.	Priority for contraceptive activities should be given to important biodiversity areas, such as protected areas with endangered wildlife, which are simultaneously in need of health services.
Millennium Water Alliance	Millennium Water Alliance	• Improve sustainable access to safe water, hygiene, and sanitation • Reduce the prevalence of water-borne diseases	Priority for health clinics and interventions should be given to important biodiversity areas, such as protected areas with endangered wildlife, which are simultaneously in need of health services. Work with these communities for health issues should address environmental health, especially the protection of watersheds and the effects of upstream pollution on downstream populations.

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
HIV/AIDS			
BELONG	Project Concern International	Increase the availability of critical OVC support services, including formal or informal education, literacy/ numeracy training, life skills education, medical care, nutritional support, psychosocial support, and child protection rights and advocacy.	Ensure that the environment is addressed in education and emphasize the links between the environment, health (clean water and pollution), and the economy (sustainable management for long-term returns). Support for processing of NTFPs (honey, forest coffee, spices, and medicinal plants) can be included in life skills training.
Decentralization of Antiretroviral Therapy to Health Centers	Management Sciences for Health HIV/AIDS Care and Support	Decrease HIV prevalence, and improve the quality of life for people living with HIV/AID, by strengthening the continuum of prevention, care, treatment. and support, including ART.	Not applicable
Geospatial Analysis for Public Health	International Rescue Committee	Support HAPN to present and conduct spatial analysis of existing PEPFAR implementation patterns, existing HIV-related epidemiological data, and other available socioeconomic, epidemiological, physical and infrastructural variables	Not applicable
Health Communication Partnership	Academy for Educational Development	Iplement new programs targeting high-risk groups (university students and commercial sex workers) and continue expanding its three existing programs.	Not applicable
Healthy Choices: Avoiding Risk, Affirming Life	Catholic Relief Services	CRS is working in partnership with the Ethiopian Catholic Secretariat and three diocese/vicariates (Harari in Dire Dawa Council, Meki in Oromia Region, and Adigrat in Tigray Region). Objectives include reducing HIV transmission among youth	Emphasize the links between the environment and health (clean water and pollution) as part of the general health message.
High Risk Corridor Initiative	High Risk Corridor Initiative	Increase accessibility to and availability of HIV prevention, counseling, and testing and palliative care services.	Priority for activities should be given to important biodiversity areas, such as protected areas with endangered wildlife, which are simultaneously in need of health services.
Making Medical Injections Safe	John Snow Inc.	• Encourage behavior change among health workers related to handling sharp objects and medical wastes • Ensure supply management • Improve health care waste management	Not applicable
Mobilizing, Equipping and Training for Primary Behavior Change	Samaritan's Purse	• Mobilize churches & communities to action by utilizing moral instruction for primary behavior change, focusing on abstinence, delay of youth sexual debut, & increasing secondary abstinence • Build and expand the capacity of communities and schools	Messages of caring for the Earth—for biodiversity and for the sustainable utilization of future generations—may also be appropriate to include.

Project Title	Prime Partner	Objectives	Biodiversity Recommendations
New Partners Initiative	Geneva Global	• Strengthen the organizational and technical capacity of local CBO • Deliver awareness/prevention education to the general public • Provide appropriate, sustainable care and support to families affected by HIV/AIDS	Through engagement with community-based organizations, USAID can select groups organized around the management of natural resources, such as water point or farmers' associations, and also incorporate messages of sustainable utilization of the land and environmental health.
Positive Change: Children, Communities, and Care (PC3)	Save the Children USA	• Increase availability, quality, and consistency of community-based support services for OVC and families affected by HIV/AIDS • Improve capacity of Ethiopian CSO to plan, implement, monitor and evaluate OVC programs and services	Priority for activities should be given to important biodiversity areas, such as protected areas with endangered wildlife, which are simultaneously in need of health services.
Private Sector Program	Abt Associates, Inc.	• Access at-risk populations in large workplaces with structured HIV prevention activities and support access to HIV/TB clinical services • Implement outreach/mobile HIV counseling and testing for at-risk populations in Oromia and Amhara	Priority for activities should be given to important biodiversity areas, such as protected areas with endangered wildlife, which are simultaneously in need of health services.
Supply Chain Management System (SCMS)	JSI and MSH	Establish a safe, secure, reliable, and sustainable supply chain management system to procure pharmaceuticals and other products needed to provide care and treatment of persons with HIV/AIDS.	Not applicable

ANNEX B. LIST OF INDIVIDUALS INTERVIEWED

Table 7. Individuals interviewed

Name and Title	Institution
Fetene Hailu, Team leader	Ethiopian Wildlife Organization
Tesfaye Awas, Ph.D. Department Head	IBC, *ex situ* and *in situ* Conservation Department
Gemedo Dale, Ph.D., Department Head	IBC, Forest Genetic Resources
Beniyam Admasu, Tourism expert	Frankfurt Zoological Society
Addisu Hailemariam, Park Warden	Bale Mountains National Park
Getachew Alemu, Park Guide	Bale Mountains National Park Guide Association
Dr. Amanuel Kassie, Manager	CARE—Awash
Mandefroh G/Tsadik, Forester	CARE—Awash
Belachew, PLI Manager	CARE—Yabello
PLI Arero Program	Save the Children—USA, Arero
PLI Arero Program	Save the Children—USA, Arero
Nigist Biru, Country Director	FEWS Net
Yacob Wondimkun, Business, Environment, Agriculture and Trade	USAID—Addis Ababa
Kevin Smith, Program Officer	USAID—Addis Ababa
Kassaye Asegid, Park fee collector	Awash National Park

ANNEX C. BIRDLIFE INTERNATIONAL LIST OF IMPORTANT BIRD AREAS IN ETHIOPIA

Table 8. Important bird areas in Ethiopia

Abijatta—Shalla Lakes National Park	Jemma and Jara valleys
Akaki—Aba-Samuel wetlands	Jibat forest
Aliyu Amba—Dulecha	Koffe swamp
Anferara forests	Koka Dam and Lake Gelila
Ankober—Debre Sina escarpment	Konso—Segen
Arero forest	Lake Abe wetland system
Awash National Park	Lake Ashenge
Awi zone	Lake Awassa
Babille Elephant Sanctuary	Lake Chew Bahir
Bahir Dar—Lake Tana	Lake Langano
Bale Mountains National Park	Lake Turkana and Omo delta
Baro river	Lake Zeway
Berga floodplain	Lakes Alemaya and Adele
Bishoftu lake	Liben plains and Negele woodlands
Bisidimo	Lower Wabi Shebelle River and Warder
Bogol Manyo—Dolo	Mago National Park
Bonga forest	Mankubsa—Welenso forest
Boyo wetland	Menagesha State Forest
Chelekleka lake and swamp	Metu—Gore—Tepi forests
Chilimo forest	Mid-Abbay (Blue Nile) river basin
Choke mountains	Mount Zuquala
Dawa—Wachile	Mugo Highlands
Denkoro forest	Nechisar National Park
Dessa'a forest	Omo National Park
Dilu Meda (Tefki)	Senkele Sanctuary
Entoto Natural Park and escarpment	Shek Husein
Finchaa and Chomen swamps	Shire lowlands in the Tekeze Valley
Fogera plains	Simen Mountains National Park
Gambella National Park	Sof Omar
Gefersa reservoir	Sululta plain
Genale river	Tiro Boter—Becho forest
Green Lake	Yabello Sanctuary
Guassa (Menz)	Yangudi-Rassa National Park
Gudo plain	Yegof forest
Hugumburda and Grat-Kahsu forests	

ANNEX D. IUCN 2007 THREATENED SPECIES IN ETHIOPIA[15]

Table 9. Threatened species in Ethiopia by species type

Mammals	Birds	Reptiles	Amphibians	Fishes	Molluscs	Other Inverts	Plants	Total
38	21	1	9	2	3	12	22	**108**

Table 10. IUCN 2007 threatened species in Ethiopia

↑ Trend: Improving	↓ Trend: Deteriorating	? Trend: Uncertain/Unknown

#	Scientific Name	Common Name	Trend
Critically Endangered			
1	Capra walie	Walia ibex	?
2	Crocidura harenna	Harenna shrew	?
3	Diceros bicornis	Black rhinoceros, hook-lipped rhinoceros	↑
4	Equus africanus	African ass, African wild ass, ass	
5	Geronticus eremita	Northern bald ibis	↑
6	Nilopegamys plumbeus	Ethiopian amphibious rat, Ethiopian water mouse	?
Endangered			
#	Scientific Name	Common Name	Trend
1	Acrocephalus griseldis	Basra reed-warbler	↓
2	Altiphrynoides malcolmi		↓
3	Balebreviceps hillmani		↓
4	Canis simensis	Ethiopian wolf, Simien fox, Simien jackal	↓
5	Capra nubiana	Nubian ibex	↓
6	Crocidura bottegoides	Bale shrew	?
7	Desmomys yaldeni	Yalden's desmomys	?
8	Dracaena ombet		
9	Equus grevyi	Grevy's zebra	↓
10	Ericabatrachus baleensis		↓
11	Falco cherrug	Saker falcon	
12	Gazella spekei	Speke's gazelle	↓
13	Heteromirafra sidamoensis	Sidamo lark	↓
14	Leptopelis susanae		↓
15	Lycaon pictus	African wild dog, Cape hunting dog, painted hunting dog, wild dog	↓
16	Muriculus imberbis	Ethiopian striped mouse, striped-back mouse	↓
17	Neophron percnopterus	Egyptian vulture	↓
18	Notogomphus cottarellii		?
19	Notogomphus ruppeli		?
20	Sarothrura ayresi	White-winged flufftail	↓
21	Serinus flavigula	Yellow-throated seedeater	?
22	Tragelaphus buxtoni	Mountain nyala	↓
23	Zavattariornis stresemanni	Ethiopian bush-crow	↓

[15] *Source:* http://www.iucnredlist.org/.

Vulnerable			
#	Scientific Name	Common Name	Trend
1	Acacia prasinata		
2	Acacia pseudonigrescens		
3	Acacia venosa		
4	Acinonyx jubatus	Cheetah, hunting leopard	↓
5	Afrixalus clarkeorum		↓
6	Afrixalus enseticola	Ethiopian banana frog	↓
7	Ammodorcas clarkei	Clarke's gazelle, dibatag	↓
8	Anopyxis klaineana		
9	Aquila clanga	Greater spotted eagle	↓
10	Aquila heliaca	Eastern imperial eagle	↓
11	Asellia patrizii	Patrizi's trident leaf-nosed bat	↓
12	Atoconeura aethiopica		↓
13	Baphia abyssinica		
14	Boswellia ogadensis		
15	Caprimulgus solala	Nechisar nightjar	?
16	Combretum hartmannianum		
17	Combretum rochetianum		
18	Commiphora monoica		
19	Cordeauxia edulis		
20	Crenigomphus abyssinicus		?
21	Crenigomphus denticulatus		?
22	Crocidura glassi	Glass's shrew	?
23	Crocidura lucina	Morrland shrew	?
24	Crocidura macmillani	MacMillan's shrew	?
25	Crocidura phaeura	Guramba shrew	?
26	Dendromus lovati	Lovat's climbing mouse	↓
27	Dicraeopetalum stipulare		
28	Dombeya longebracteolata		
29	Dorcatragus megalotis	Beira antelope, beira	↓
30	Elattoneura pasquinii		?
31	Euphorbia doloensis		
32	Euphorbia uniglans		
33	Falco naumanni	Lesser kestrel	↓
34	Francolinus harwoodi	Harwood's francolin	↓
35	Gazella dorcas	Dorcas gazelle	↓
36	Geochelone sulcata	African spurred tortoise, grooved tortoise	
37	Grammomys minnae	Ethiopian thicket rat	?
38	Hippopotamus amphibius	Common hippopotamus, large hippo	↓
39	Hirundo megaensis	White-tailed swallow	↓
40	Hypericum gnidiifolium		
41	Indigofera rothii		
42	Ischnura abyssinica		?
43	Leptopelis ragazzii		↓
44	Leptopelis vannutellii		↓
45	Lissonycteris petraea	Petra fruit bat	↓
46	Lophuromys melanonyx	Black-clawed brush-furred rat	?
47	Loxodonta africana	African elephant	?

#	Scientific Name	Common Name	Trend
48	Mastomys awashensis	Awash mastomys, Awash multimammate mouse	↓
49	Maytenus harenensis		
50	Mirafra degodiensis	Degodi lark	?
51	Mormopterus acetabulosus	Natal free-tailed Bat	↓
52	Myotis morrisi	Morris's bat	?
53	Myotis scotti	Scott's mouse-eared bat	↓
54	Nanger soemmerringii	Soemmerring's gazelle	↓
55	Ocotea kenyensis		
56	Panthera leo	African lion, lion	↓
57	Plecotus balensis	Ethiopian big-eared bat	?
58	Prunus africana	Red stinkwood	
59	Pseudagrion guichardi		?
60	Pseudagrion kaffinum		?
61	Rhinopoma macinnesi	Macinnes's mouse-tailed bat	?
62	Serinus ankoberensis	Ankober serin	↓
63	Serinus xantholaemus	Salvadori's serin	?
64	Spinophrynoides osgoodi		↓
65	Tachyoryctes macrocephalus	Big-headed mole rat	?
66	Tauraco ruspolii	Prince Ruspoli's turaco, Touraco de Ruspoli (fre)	↓
67	Terminalia hecistocarpa		
68	Torgos tracheliotos	Lappet-faced vulture	↓
69	Trigonoceps occipitalis	White-headed vulture	↓
70	Vepris borenensis		

ANNEX E. PROTECTED AREAS OF ETHIOPIA

The area of Ethiopia is roughly 1,133,000 square kilometers (113,337,980 hectares) or 437,600 square miles (280,044,000 acres). A hectare equals 2.471 acres; a square kilometer equals 0.386 square miles. Between 1965 and 1980, 9 national parks, 4 wildlife sanctuaries, 7 wildlife reserves, and 18 controlled hunting areas were established. Tables 11-16 were compiled from information from McKee (2007) and the Institute of Biodiversity Conservation (2005).

Table 11. Protected Areas in Ethiopia by Category, Number, and Size

Category	Number of Areas	km²	Percentage Area
National parks	9	20,832	1.8
Wildlife sanctuaries	4	9,532	0.8
Wildlife reserves	8	24,810	2.2
Priority forest areas	58	47,779	~4.0
Controlled hunt areas	18	n.a.	~ 5?
Total	97	102,953	~14

Table 12. National parks[16]

Protected Area	Size km²	Region	Habitat	Species: Mammals	Species: Birds	Reason Established
Abijatta-Shala	887	Oromiya	Two rift valley lakes, *Acacia-Commiphora* woodland, woodland, and evergreen scrub	76	457	Protects aquatic birds
Awash	756	Oromiya/Afar	Semi-arid thorn-bush, *Acacia-Commiphora* woodland, and evergreen scrub	76	451	Protects Beisa oryx, Soemmerring's gazelle, and Swayne's hartebeest
Bale Mountains	2,471	Oromiya	Rare Afroalpine habitat, moist highland forest, dry montane woodland, evergreen scrub	67	265	Protects endemic mountain nyala, Ethiopian wolf, and giant mole rat
Gambella	5,061	Gambella	*Combretum-Terminalia* woodland and savanna, lowland evergreen and moist evergreen montane forests, swamp	43	327	Protects Nile lechwe, white-eared kob, and whale-headed stork

[16] Only the Awash and Simien Mountains National Parks are gazetted.

Protected Area	Size km²	Region	Habitat	Species: Mammals	Species: Birds	Reason Established
Mago	2,162	Southern	Desert and semidesert scrubland, *Acacia-Commiphora* woodland and *Combretum-Terminalia* woodland, savanna	81	237	Primarily for protection of buffalo, giraffe, and elephant
Nechisar	514	Southern	Lakes, Rift Valley escarpment, groundwater forest, hot springs, grasslands	84	332	Protects Swayne's hartebeest and Burchell's zebra; also portions of two lakes for crocodile and hippopotamus
Omo	4,068	Southern	Desert and semidesert scrubland, *Acacia-Commiphora* woodland and *Combretum-Terminalia* woodland, savanna	69	300	Numerous large mammal species; among the most important are common eland, buffalo, and elephant
Simien Mountain	179	Amhara	Afroalpine and dry evergreen montane forest	33	125	Protects the Walia ibex and Ethiopian wolf
Total	**16,098**					

Table 13. Wildlife sanctuaries

Protected Area	Size km²	Region	Habitat	Species: Mammals	Species: Birds	Reason Established
Babille elephant	6,982	Afar	Desert and semidesert scrubland, *Acacia-Commiphora* woodland, and evergreen scrub	22	106	Protects endemic subspecies of elephant
Kuni-Muktar			Dry evergreen montane forest	23	24	Protects mountain nyala, Menelik's bush buck
Senkele Swayne's hartebeest		Southern	*Acacia-Commiphora* woodland and evergreen scrub	37	191	Protects Swayne's hartebeest namesake; most viable population in Ethiopia.
Yabello	2,500	Oromiya	Desert and semidesert, scrubland, and evergreen scrub	43	280	Protects a population of Swayne's hartebeest, Stresemann's bushcrow, and white-tailed swallow
Total	**9,482**					

Table 14. Wildlife reserves areas

Name	Area km²	Region	Ecosystem	Major Wild Animal Species Conserved
Alledeghi	1,832	Oromiya	Desert and semi-desert scrubland and *Acacia-Commiphora* woodland	Oryx, Soemmerring's gazelle, greater and lesser kudus, ostrich
Awash west	1,781	Oromiya	*Acacia-Commiphora* woodland and evergreen scrub	Greater and lesser kudus and oryx
Bale	1,766	Oromiya	Dry evergreen montane forest and Afroalpine and sub-Afroalpine mountain	Nyala and Menelik's bush buck
Chew Bahir	4,212	Southern	Ethiopia desert and semi-desert scrubland	Grevy's zebra, Grant's gazelle, gerenuk, oryx, lesser kudu
Gewane	2,431	Afar	Desert and semi-desert scrubland and *Acacia-Commiphora* woodland	Soemmerring's gazelle, greater and lesser kudus, ostrich
Mille-Serdo	8,766	Afar	Desert and semi-desert scrubland and *Acacia-Commiphora* woodland	Soemmerring's gazelle, greater and lesser kudus, ostrich
Shiraro-Kefta	753	Tigray	*Combretum-Terminalia* woodland and savanna, evergreen scrub, and *Acacia-Commiphora* woodland	Elephant, roan antelope, greater kudu, oribi
Tama	3,269	Southern	*Acacia-Commiphora* woodland and *Combretum-Terminalia* woodland and savanna	Giraffe, Burchell's zebra, and Lelwel hartebeest
Total	**24,810**			

Table 15. National forest priority areas

	Name of Area	High Forest (hectares)		Manmade Forest (hectares)	Other Forest (hectares)	Total Area (hectares)
		Slightly Disturbed	Heavily Disturbed			
1	Arbagugu	n.a	6,300	1,600	13,500	21,400
2	Chilalo Galama	n.a	n.a	1,400	20,600	22,000
3	Munesa Shashemne	7000	10,200	6,800	74,200	98,200
4	Neshe-Batu Adaba Dodola	n.a	10,000	1,700	28,300	40,000
5	Logo	5,000	16,400	900	36,700	59,000
6	Goro Bele	9,800	50,000	200	40,000	100,000
7	Harena Kokosa	20,000	70,000	n.a	92,000	182,000
8	Kubayo	5,000	17,900	300	55,200	78,400
9	Mena-Angetu	20,000	50,000	200	119,800	190,000
10	Bulki Malokoza	n.a	n.a	500	10,500	11,000
11	Gidola Gamba	15,000	5,000	n.a	10,000	30,000
12	Gidole Gamba	n.a	n.a	1,200	14,800	16,000
13	Guwanga Kahitas	n.a	32,000	2,800	21,700	56,500
14	Sekela Mariam	n.a	n.a	2,000	8,000	10,000
15	Butiji Melkajebdu	n.a	n. a	3,800	41,400	45,200
16	Dindin Arbagugu	n.a	n.a	5,900	57,600	66,800
17	Gara Muleta	n.a	2,600	2,000	2,400	7,000
18	Jalo Muktare	n.a	2,500	4,100	14,700	21,300
19	Iaro Gursum	n.a	1,500	4,500	46,300	52,300
20	Abobo Gog	150,000	45,000	100	22,900	218,000
21	Gebre Di ma	50,000	82,000	n.a	33,000	165,000
22	Godere	40,000	100,000	500	19,500	160,000
23	Sele Anderacha	100,000	115,000	700	9,300	225,000
24	Sibo Tale Kobo	28,000	50,000	1,900	20,100	100,000
25	Sigemo Geba	67,700	190,000	2,300	20,000	280,000
26	Yayu	20,000	100,000	300	29,700	150,000
27	Yeki	10,000	100,000	500	11,500	122,000

	Name of Area	High Forest (hectares)		Manmade Forest (hectares)	Other Forest (hectares)	Total Area (hectares)
		Slightly Disturbed	Heavily Disturbed			
28	Wangus	329,900	n.a	n.a	85,100	415,000
29	Mesenigo	292,350	n.a	650	32,000	325,000
30	Abelti Gibe	n.a	4,700	1,300	4,000	10,000
31	Babiya Fola	n.a	45,000	900	28,400	74,300
32	Belate Gera	76,500	35,200	1,100	35,700	148,500
33	Bonga	7,000	10,000	2,100	142,300	161,400
34	Gura Farda	80,000	35,100	800	224,100	340,000
35	Tiro Boter Becho	16,000	23,300	2,300	44,200	85,800
36	Butajira	n.a	n.a	1,600	13,400	15,000
37	Chilimo Gaji	n.a	2,000	800	23,200	26,000
38	Gedo	2,000	3,000	n.a	5,000	10,000
39	Jibate Muti Jegenfo	n.a	5,000	n.a	33,500	38,500
40	Menagesha Suba	n.a	3,600	1,300	4,900	9,800
41	Wof Washa	n.a	2,000	4,200	2,700	8,900
42	Yere Diregebrecha Zukala	300	3,800	1,700	3,800	9,600
43	AnderaraWadera	n.a	13,000	3,700	89,900	106,600
44	Bore Asferara	n.a	33,000	1,400	182,900	217,300
45	Megada	5,000	10,000	1,300	4,500	20,800
46	Negele	n.a	1,200	300	16,300	17,800
47	Yabelo Arero	n.a	8,000	150	41,750	49,900
48	Dasa	n.a	n.a	n.a	20,000	20,000
49	Chato Sengi Dengeb	n.a	5,000	60	39,800	44,860
50	Gergeda	20,000	20,000	1,000	96,400	137,400
51	Gidame	n.a	10,000	n.a	7,000	17,000
52	Jurgo Wato	n.a	15,000	200	4,700	19,900
53	Komto Waja Tsega	n.a	1,000	1,200	6,900	9,100
54	Konchi	10,000	5,000	n.a	8,000	23,000
55	Linche dali Gewe	n.a	15,000	n.a	25,000	40,000
56	Dekoro	n.a	2,300	n.a	3,000	5,300
57	Guwobirda Girakaso	n.a	11,500	2,200	12,300	26,000
58	Yegof Erike	n.a	2,800	8,400	6,800	18,000
Total		**1,386,550**	**1,381,900**	**84,860**	**2,121,250**	**4,977,860**

Table 16. Controlled hunting areas

Name	Area (km²)	Region	Region Form of Hunting	Major Trophy Species
Hanto	480	Oromiya	Concession	Mountain nyala, Menelik's bush buck
Arbagugu	225	Oromiya	Concession	Mountain nyala, Menelik's bush buck
Munessa Kuke	111	Oromiya	Concession	Mountain nyala, Menelik's bush buck
Ababasheba Demero	210	Oromiya	Concession	Mountain nyala, Menelik's bush buck, giant forest hog
Besmena Odobulu	350	Oromiya	Concession	Mountain nyala, Menelik's bush buck, giant forest hog
Kebena	300	Afar	Concession	Beisa oryx, Soemmerring's gazelle
Blen hertele	1,095		Concession	Gerenuk, beisa oryx, Soemmering's gazelle
Telalk Dewe Lesser Kudu	150	Afar	Concession	Beisa oryx, Soemmering's gazelle
Murulle	1,111	Southern	Concession	Topi, buffalo, greater kudu, Grant's gazelle
Woleshet Sala	500	Southern	Concession	Buffalo, Grant's gazelle
Dindin	110	Southern	Concession	Mountain nyala, Menelik's bush buck
Gara Gumbi	n.a	Afar	Open	Salts dik-dik, lesser kudu
Gara Miti	n.a	Oromiya	Open	Klipspringer, dik-dik
Debrelibanos	n.a	Oromiya	Open	Gelada baboon
Aluto Kulito	n.a	Oromiya	Open	Greater kudu
Jibat	n.a	Oromiya	Open	Giant forest hog, bush pig, Menelik's bush buck, colobus monkey
Koka	n.a	Oromiya	Open	Bohor, reed buck
Gelial Dura	n.a	Afar		Warthog, waterbuck, dik-dik, bohor, common bush buck

ANNEX F. BROAD VEGETATION TYPES OF ETHIOPIA