US Forest Service International Programs, Department of Agriculture

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Technical Assistance to the US Government Mission in Burundi on Natural Resource Management and Land Use Policy

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(Cover photo: M. Chaveas)

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ACRONYM LIST

AFEB	*Association Femme – Environnement au Burundi*
CARPE	Central African Regional Program for the Environment
CRS	Catholic Relief Services
FAO	Food and Agriculture Organization of the United Nations
FNL	*Forces Nationales de Libération*
GCDB	Geographic Coordinate Data Base
GDP	Gross Domestic Product
GOB	Government of Burundi
GPS	Global Positioning System
IDP	Internally Displaced Persons
IGEBU	*Institut Géographique de Burundi*
INECN	*Institut Nationale pour l'Environnement et la Conservation de la Nature*
IP	International Programs (of the US Forest Service)
NGO	Non-Governmental Organizations
NRM	Natural Resource Management
OTI	Office of Transition Initiatives (USAID)
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
USFS	United States Forest Service

1. INTRODUCTION

The US Forest Service International Programs office (USFS IP) has a long history of promoting sustainable natural resource management throughout Africa. USFS IP provides targeted technical assistance by working in collaboration with host-country government forest and natural resource management institutions, the US Agency for International Development (USAID) and US State Department, as well as local and international NGOs. By linking the skills of its 35,000 employees with partners overseas, the USFS, through the International Programs office, provides its partners with access to the wealth and diversity of skills that the agency possesses. USFS technical experts are able to apply sound natural resources management principles and lessons learned from over 100 years of forest and grassland management in the USA, to similar issues faced by partners overseas, and help them address critical resource issues and concerns. The USFS administers approximately 78 million hectares (193 million acres) of National Forests and Grasslands in the United States, employing a multiple-use approach to land management, and has developed systems to plan for, implement, and monitor impacts of a variety of land uses, including logging, recreation, mining, biodiversity and habitat conservation, watershed management, and grazing, among others, on national forest lands[1].

While new to Burundi, the USFS has developed an extensive array of experience in this region of Africa through the provision of technical assistance in Rwanda and Uganda, and long term involvement in USAID programs in Tanzania and the Democratic Republic of Congo as a Central African Regional Program for the Environment (CARPE) implementing partner. Additional experience in post-conflict African nations on the part of the USFS includes activities in Liberia and Sierra Leone.

In order to assist the US Government mission in Burundi, interest was expressed by the US Embassy in Bujumbura to have the USFS send a technical assistance team to work in collaboration with the US mission and their partners. The interest in this first mission to Burundi on the part of the USFS was to have a team focus on assessing existing natural resource management and protection activities and their impacts on Burundi's biodiversity, and the national level policies dealing with land use and property rights in the country. The objective of this assessment was to provide recommendations on improving land use, tenure and property rights policies for the country and to evaluate ongoing resource management projects, as well as recommend new areas of potential intervention which will aid in securing the long term sustainability of these resources. Figure 1 maps the team's course throughout the country during this visit, while Appendix A details the itinerary taken.

[1] More information on the USFS can be found at *www.fs.fed.us*, and on International Programs activities around the world at *www.fs.fed.us/global*

Figure 1: The USFS team's itinerary through Burundi. Week one included the provinces south of Bujumbura; Bujumbura Rural, Bururi, Makamba, Rutana, Gitega and Muramvya. The second week included the northern provinces of Kayanza, Kirundo and Muyinga. Numbers indicate overnight stays, while Xs represent major stops. More stops were taken then are indicated on this map.

2. BACKGROUND AND CONTEXT

As a fragile state, transitioning from years of civil war to more peaceful and hopeful times, Burundi faces many challenges regarding the management of its natural resources, which support a very densely populated country. The years of war in Burundi and the greater region have led to a large number of refugees and internally displaced peoples with no clear land tenure or property rights who, as a result, are rapidly degrading the existing soil, water and forest resources while attempting to meet their basic needs for

food, fuel and shelter. Additionally, weak land tenure and property rights systems as well as a lack of ownership records threaten to undermine the progression towards a long term peace and cause renewed conflict in the country as returning refugees and displaced peoples continue to return to their homes of origin.

Due in part to these land tenure issues, Burundi is facing a number of challenges to the health of the country's environment. Widespread deforestation from exploitation for firewood, charcoal and construction materials is rapidly degrading the remaining natural forests and the biodiversity dependent upon those ecosystems, as well as diminishing water supplies for many populations. With a population density as high as 300 people/km^2 or more in parts of the country, the second highest in Africa, family agricultural plots average less then ½ a hectare in size and are becoming increasingly fragmented as the population grows, currently at an estimated rate of 3.4% (USAID Strategy Statement 2006-2008). This heavy pressure on the land is impacting soil fertility and leading to heavy erosion (Figure 2), while wetlands are being drained and developed for agriculture to accommodate ever increasing populations. Erosion rates are intensified further by widespread rock quarrying on hillsides and the removal of clayey soils for the manufacture of bricks. Meanwhile, the country's natural vegetation has been virtually wiped out apart from what remains in a few national parks and forest reserves.

Figure 2: Intensive agriculture in small plots on steep hillsides, with little or no erosion controls in place is leading to a rapid degradation of Burundi's land base (photo: M. Chaveas).

Over 90 percent of Burundi's working population is directly tied to the land for their livelihoods through agriculture, yet the land is no longer able to provide an adequate livelihood for these families as the volume of food production has not been able to keep pace with population growth. Poor crop yields due to long years of conflict, soil depletion and land fragmentation into smaller and smaller plots have been further aggravated by several years of droughts (D. Banderembako 2006). These are some of the factors that have left Burundi as one of the poorest nations in the world by virtually every

available measure of poverty, including per capita income[2] and GDP[3], as well as through the UNDP's Human Development Index[4].

Since its independence in 1962, Burundi's history has been marked by multiple outbreaks of bloody conflict, most notably those beginning in 1972 and 1993, the latter of which lasted 12 years, formally ending with multiple rounds of parliamentary and presidential elections in 2005. Three days prior to the arrival of the USFS team in Burundi the last rebel group still active in the country, the *Forces Nationales de Libération* (FNL), signed a cease-fire agreement with the government. The culmination of this prolonged and brutal conflict, the beginning of democratic processes and the official end of a standoff with the last armed resistance group in Burundi provides a great sense of optimism for the country's future. However, there are many factors to temper that optimism with caution as the conditions for renewed conflicts still exist, not least of which is the issue of land tenure and property rights and the impacts land use policies are having on the state of the natural resource base.

While the reported numbers of refugees and internally displaced persons (IDPs) from these conflicts varies, several hundred thousand people have been forced to leave their homes during the years of conflict. These refugees have been returning in recent years, or will be returning in the near future, to their homelands seeking to reclaim land that is now occupied and employed in cultivation by those who moved in during the conflict years or soon thereafter. The refugees from the 1972 and 1993 conflicts who are now returning to Burundi pose different sets of challenges. Those returnees from the 1972 conflict have remained in Tanzania since that time. They now return to Burundi one or two generations removed from the land to which they lay claim, land which has had other families occupying it for one or two generations. Meanwhile, many of the IDPs have been settled into villages, often with services such as water and electricity which they did not have prior to being displaced. There seems to be widespread disagreement as to whether these IDPs should be allowed to remain where they are, or if they should be resettled back to their homelands. These resettlement issues, along with the high population pressures on the land, are causing conflicts between claimants of land, and will undoubtedly continue to do so for many years. Estimates indicate that approximately 80 percent of conflicts reaching Burundian courts are directly related to land (USAID Strategy Statement 2006-2008), and as the volume of returnees swells with increasing confidence that the peace in Burundi will last, these conflicts hold the potential to erupt into further bloodshed.

It is difficult to paint a rosy picture of the condition of Burundi's resources and what the future may hold for the Burundian people. The country is at a crisis point with regards to its resource base and the future livelihoods of its people whose wellbeing is directly

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[2] US$100 in 2005, lowest in the world.
(*http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf*)
[3] US$800 million in 2005, 162nd or 183 countries ranked
(*http://siteresources.worldbank.org/DATASTATISTICS/Resources/GDP.pdf*)
[4] UNDP Human Development Index 2005: Burundi rated 169th out of 177 ranked countries.
(*http://hdr.undp.org/reports/global/2005/*)

linked to the land. Intense, aggressive, well coordinated and immediate interventions are needed on a large scale throughout the country, and with peace finally returning, and hopefully holding, the time is right to scale up these efforts. The USFS team saw several examples of good programs which are ongoing, unfortunately the current scale is too small to effect any lasting change.

3. LAND POLICY AND CONFLICT

Upon arrival in Burundi, the USFS assessment team was given the opportunity for detailed discussions about land policy and conflict with USAID staff; government representatives from resource departments within the Ministry of Territorial Administration, Tourism and Environment, as well as the Minister herself; and non-governmental organization (NGO) representatives.

Figure 3: Provincial map of Burundi (Source: United Nations Department of Peacekeeping Operations, Cartographic Section, September 2004)

During this two week visit, the team was accompanied through 11 of the 17 provinces[5] (Figure 3) by USAID and Ministry staff[6] on two extensive 3-day field trips. On these trips, the team met with several provincial governors (or their representatives) and, in some cases, resource staff. Local insights and ideas about the various factors contributing to the land conflict and possible solutions were discussed during these meetings. The team was also able to observe the condition of the landscape, as well as some on-the-ground mitigation projects that the government, USAID, and NGOs are conducting to help resolve the land conflict.

Role of the Burundian government in resolving land conflict

Although the government's priorities for 2006 include economic recovery, reconciliation, governance and environmental protection - as well as a pledge to reorganize judicial institutions and reintegrate returnees – it has yet to identify the land conflict as an *urgent* priority. Initial steps taken to address the land conflict include the drafting of a new national Land Code and the recent appointment of a Land Commission.

- *Land Code.* A new Land Code has been drafted, but has not competed successfully for the serious attention of the government. It has been awaiting approval, pending review, since 2004. The new code is intended to replace the 1986 Land Code which contains numerous problems and is reported to be largely un-enforced. For example, it requires that all land transactions be recorded in deeds – something that rarely occurs in practice - and it conflicts with the existence of a parallel traditional system that takes informal precedence. One of the specific objectives of the USFS mission to Burundi was to assess the impacts of existing and new land policies. Although translated texts of the existing and new draft Land Code were not available, a comparative summary of both texts - prepared by the NGO Global Rights - was provided for review.

- *Land Commission.* A new Land Commission was appointed in 2006 and is housed with the Ministry of National Solidarity. One of the initial priorities of the Commission is to hear and adjudicate land and natural resource related conflicts and grievances associated with repatriation. Land-related functions are spread over four other national ministries, including the Ministry of Territorial Administration, Tourism and Environment. This leads to confusion over roles and responsibilities, and conflicting or competing policies between ministries. The Ministry of Environment recognizes the inter-related economic, political, social and environmental challenges Burundi is facing, and is participating in land policy development and resource enhancement activities.

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[5] Bujumbura Mairie, Bujumbura Rural, Bururi, Makamba, Rutana, Gitega, Muramvya, Kayanza, Ngozi, Kirundo and Muyinga (the team also entered a small part of Cankuzo province, but only inside Ruvubu National Park).

[6] Ministry staff accompanying the USFS team were Astère Bararwandika, Director of the Forest Department (1st week); Faustin Harumukiza, Forest Department advisor (2nd week); Eugenie Nduwayo of the national erosion control program; and Benoit Nzigidahera, Ecologist with the National Institute for the Environment and the Conservation of Nature (INECN).

Role of other organizations in resolving land conflict
Non-governmental organizations are knowledgeable about the land tenure and property rights problems. They are working to foster the development and adoption of the Land Code, improve the quality of information available to the public about land issues, provide training to improve the livelihoods of citizens, and facilitate conflict resolution and legal services within the framework of traditional community leadership. Four NGOs have formed a consortium to implement the recommendations developed at the first land conflict forum held in March 2006. They intend to hold a second forum soon, and have coordinated efforts with representatives from other NGOs addressing the same issues. NGOs, with CARE in the lead, are conducting field research initially focused on the identifying the various types of land-related conflict. This will lead to recommendations for training approaches and mechanisms specifically tailored to the type of property right conflict. Subsequent research teams will focus on other themes (e.g. a critical analysis of land management conflicts, which will include diversifying and improving the livelihoods of those living without land).

3.1 Issues and Challenges
Over the course of the mission the USFS team identified the following primary issues related to the national land policy and conflicts over land. These issues were identified through field visits; discussions with Burundian government representatives, US government officials in Burundi, and NGO representatives; as well as through reviews of the existing data and literature we were able to locate.

A critically poor and non-diversified economy
Burundi is one of the poorest countries in the world, ranking 169 out of 177 in the 2005 United Nations Development Program's Human Development Report. According to the same report, well over half of the population is estimated to live below the poverty threshold (on average, 58% and 89% of the population earned < $1 and < $2 per day, respectively, during the 1990-2003 period). A correspondingly high percentage (68%) suffers from malnutrition. Approximately 4.5% of the land area of Burundi is protected as national parks or reserves. Over the past decade, environmental degradation and resource depletion have led to a serious loss of agricultural productivity. According to World Bank estimates, 9% of Burundi's forests disappeared each year from 1990 to 2000, the highest rate of deforestation in the world. These factors, combined with the fact that approximately 90% of the population is dependent upon subsistence agriculture, are placing overwhelming pressure on limited land resources.

Population growth
The population of Burundi is currently estimated at 7.5 to 8 million. This equates to a population density of 250 - 300 people per square kilometer, second only to Rwanda in Africa. The 3% annual growth rate – if sustained – will double these figures every 20 years. Population growth, combined with traditional inheritance systems and a lack of economic alternatives, has resulted in extremely fragmented agricultural plots which have shrunk to an average size of less than ½ hectare per family.

Repatriation of refugees and reintegration of internally displaced persons
Recurring conflicts and adverse climatic conditions have caused frequent displacement of large numbers of people. As more stable conditions permit, hundreds of thousands of refugees are expected to return. In most cases, the initial cause of the displacement will guide the type of solution required. For example, lands previously occupied by refugees dislocated during the 1972 and earlier conflicts were taken by others. It is the return of these refugees who seek to reclaim their land, one or two generations removed from the individuals who actually farmed it before the conflict, that has resulted in the current friction with the existing occupants. As a result of the irreconcilable conflicts created by the illegal occupation of lands subsequent to the 1972 conflict, the government of Burundi passed a law to protect the lands of refugees displaced during the 1993 conflict. The assessment team was informed that these lands were typically taken over by relatives and that the refugees returning from the most recent conflict will have lands to return to. In addition, there are a series of de facto communities (i.e. IDP camps) that were established as a means of protection for internally displaced persons during the 1993 conflict.

Figure 4: An IDP camp in central Burundi. There is no widespread consensus as to whether the inhabitants of these "camps" should be encouraged to remain in place or to return to their homes of origin (photo: M. Chaveas).

Opinion is divided among the provinces visited about re-integration of this segment of the population. One provincial governor supported the concept of not disbanding IDP camps where there is adequate infrastructure in place. Another stated unequivocally that IDP camps in his province needed to be disbanded. He explained that the camps were erected quickly, that basic infrastructure and services (e.g. water, electricity) were not in place, nor was there enough land available at these sites for cultivation. (Evidence to the contrary was directly observed by team members, and there was general disagreement with this explanation among the team's escorts). He further indicated that one of the occupied sites was needed by the government for the construction of a new stadium. Controversial government expropriations of land compound the threats against peace and stability in Burundi. Finally, there are land-related conflicts associated with significant

numbers of migrants from adjacent countries (e.g. Rwanda, Democratic Republic of Congo) encroaching on indigenous land, as well as utilizing wood and water resources, that are not specifically addressed in this report.

Lack of an effective Land Code and land tenure system

As reported earlier, there is no cohesive and coherent Land Code and corresponding policies in place to address the land conflict in Burundi. The country has a tradition of dividing land through inheritance. Under this tradition, women do not inherit land, contributing to inequality and inter-familial conflicts. Beyond an informal "witnessing" system involving traditional leadership (Abashingantahe), there is no formal land tenure system for most of the land in Burundi. Only 5% of the land is registered. Without formal proof of ownership, land cannot be used as collateral for credit. Until a land tenure system is formalized, tenure insecurity makes foreign investment impossible, severely limits domestic commercial investment, and impairs the emergence of financial markets.

Social conflicts over unclear property rights in rural areas have been escalating, and present a major challenge to the population. The causes are variable and complex, as are the solutions. Approximately 80 to 90 percent of the conflicts brought before the courts are related to land issues. To date, attempts to address the claims of returnees have been limited.

3.2 Recommendations

As outlined above, there is a complex set of inter-related social, economic, political and environmental factors that – unless mitigated – will continue to thwart Burundi's ability to effectively resolve land-related conflicts. Until meaningful progress is made, the tenuous stability and peace within the country, as well as the livelihoods of most of its citizens, are at high risk.

As noted, many agencies and organizations are actively involved in implementing activities to resolve land conflict problems, and are dedicated to achieving an effective Land Code. The problems are daunting and the resources to effect positive change are limited. Every effort should be made to closely coordinate government and non-government activities to avoid unnecessary and costly duplication, and assure that lessons learned are noted and shared so that pitfalls are recognized and avoided, and successes can be replicated. Assigning a "lead party" (i.e. government or non-government) to each major component of a strategy, and utilizing a "clearinghouse" approach to information sharing will help streamline efforts and promote success.

The remainder of this section will address this team's short- and long-term recommendations. It is the hope of the authors that these recommendations can be well-coordinated with other ongoing efforts, and that human rights – particularly those of women and children - be consistently monitored. It will take a unified and aggressive effort to increase stability and economic growth, and assure that human rights are protected in Burundi.

Short-term recommendations

1. Develop a multi-faceted strategy for those "living without land" that promotes economic transformation to non-agricultural income generating activities and improves the living standards of the population.
    1.1 Expand trade, technical and vocational job training facilities. The USAID-sponsored Giheta Vocational Skills Training School, initially established under the Office of Transition Initiatives (OTI) program, should be used as a model and replicated on a large scale across Burundi (Figures 5 and 6). Successful re-training of the population in non-agricultural disciplines is essential.

Figures 5 and 6: Carpentry and seamstress trainees at the Giheta Vocational Skills Training School. Other opportunities at the school include training in housing construction. (photos: 5 M. Chaveas, 6 J. Evenden)

1.2 Provide incentives for training and jobs program and give priority to returnees who voluntarily relinquish their rights to occupied land in exchange for this training and possibly some material and/or financial support to start a business.
1.3 Develop a land use planning framework that optimizes the cultivation of land most valuable for agricultural production, and clusters other types of development (e.g. municipal, industrial) on land less suitable for crops.
1.4 Create voluntary pilot villages with attractive enough incentives to convince citizens that a communal lifestyle provides benefits that outweigh subsistence living on fragmented plots of land. Keep human rights considerations at the forefront.
1.5 Implement family planning, education and economic incentive programs, with a particular focus on women's rights. We realize that these are typically unpopular programs, but are including them as recommendations because we believe they afford a significant opportunity.
1.6 Integrate effective environmental education programs into school curricula at all levels. Building understanding and awareness of the effects of the activities of the population on the environment will be essential to effecting the foundational changes necessary to assure Burundi's viability.

2. Aggressively focus efforts on resolving land conflicts quickly for returning refugees, and provide legal services.
   2.1 Utilize a "lead party" approach to this recommendation for the reasons outlined above.
   2.2 Support community-based paralegals and mobile legal clinics.
   2.3 Coordinate efforts between the government and NGOs to assure consistency and avoid duplication of efforts and resources.
   2.4 Establish and communicate best practices for mediated settlements.
   2.5 Develop an inventory of cases heard, and document success rates and lessons learned.

3. Keep IDPs in place, where it makes sense. If infrastructure for IDPs has already been developed, and the capacity exists, it may be appropriate to expand the community in place. It is understood that there are a number of arguments against this concept – not least the perception of inequity for those who may not have access to the same communal benefits. However, clustering development in a manner that reduces impacts on the land is consistent with the ministry's support of "villagization," and offers the best opportunity for wiser utilization of the country's limited resources.

Long-term recommendations

1. Finalize the Land Code, policies and regulations in an open and transparent process to ensure the appropriate scope and level of involvement of stakeholders. Establish a cooperative partnership between the new Land Commission and stakeholders to assure that priority is given to good governance issues, including transparent management of public funds and natural resources.

It is evident that the lack of coherent rules governing land ownership has had serious implications. Although completing the Land Code and regulations will help resolve property rights related legal issues, it will not end the battle over scarce resources. Other efforts to address the land conflict should not await ratification of the Land Code; for that reason a longer-term priority is placed on this recommendation.

Although the team did not review the texts of the existing and new Land Codes, they did review a comparative summary of some of the principle proposed changes, prepared by the NGO Global Rights. What follows are a few observations about the proposed revisions.

The draft Land Code addresses the use of deeds, affidavits, certificates of ownership and "customary modes of acquisition," but appears to be silent about a minimum acceptable standard or mechanism by which legal subdivisions of properties between ownership will occur in advance of registration. It is written around a premise that landowners will be able to agree – as a result of clarifying language in the new Land Code, mediation or good will – who owns what. This may be an acceptable immediate solution, but if a formal nationally-consistent system of parcel delineation and description is not adopted, conflicts over land tenure will be perpetuated indefinitely. Unless the "boundary demarcation and land surveying report on rural land" referenced in Article 647 already accomplishes this, the new Land Code should at least make mention of the need to adopt a national standard for parcel delineation and description, and the corresponding implementing regulations should address the details.

We acknowledge the many apparent improvements proposed in the draft Land Code – particularly in the area of conflict mitigation and resolution. For example, clarification of the definition for "prescriptive rights" (Article 75); provision for equal recognition/legal protection of rights confirmed by deed or through customary mode of acquisition (Article 402); limits placed on losses related to government expropriation (Articles 454, 466 & 477); and provisions for making land tenure transactions secure (Articles 488 & 491) should effect positive change. We also support the updated provisions in the new Land Code that address the protection of resources and public property, open public access, and sustainable land use; e.g. Articles 173, 275, 402 and 492-540, as well as those that assure the involvement of women in the decision-making process (Articles 35 & 53). We remain concerned, however, about how the Land Code will assure that the rights of indigent and landless persons (e.g. internally displaced persons, Batwa) are protected, as well as assuring women's rights to land - not necessarily through inheritance, but through other means. Finally, without adequate funding as well as the will of the government to implement the law, its reforms and provisions will be in vain.

2. Establish a formal landownership record system that will allow landowners to access the collateral needed to pursue alternative income generating activities, and provide incentives for outside investments in the country. This recommendation will take massive resources, since it requires establishment and delineation of specific land boundaries between ownerships, and the issuance of deeds. Field surveys would generate the most defensible boundaries; however there may be opportunities to utilize new technologies to develop boundary and title management plans in which individual parcels could be uniquely described for occupation, conveyance or management activities. The Global Positioning System (GPS) could provide a limited number of geographic survey control points in which an electronic landnet, such as the US Geographic Coordinate Data Base (GCDB), could be generated over a specific land area. Once the electronic landnet is extended over the defined area, smaller predefined parcels could be further described. Geographic coordinates could then be generated from the defined parcel boundaries which could be used to locate and monument specific parcels on the ground.

3. Encourage the international community to continue to develop placement alternatives for the hundreds of thousands of Burundian refugees. In mid-October it was announced that 13,000 refugees who left Burundi in 1972 and settled in Tanzania may resettle in the United States. Refugees International estimates that more than 95 percent of displaced Burundians have no home to return to. Other resettlement agreements – in other African countries with available land, and elsewhere around the globe - should be negotiated to maximize placement outside of Burundi.

4. NATURAL RESOURCE MANAGEMENT AND BIODIVERSITY CONSERVATION

As described previously, over 90% of Burundi's population draws its livelihood directly from agriculture. The dense and rapidly growing population practices subsistence farming from a land base that has been largely deforested, soils that are depleted from overgrazing, agricultural practices that cause erosion and wetlands and bottomlands that have been extensively cultivated. In addition the land ownership of the average farmer is less than ½ hectare and ever shrinking due to land fragmentation from inheritance practices and land ownership conflict fueled by returning IDP's and refugees. All these factors also play a significant role in the loss of biodiversity in both the existing protected areas and in the small remaining intact terrestrial and aquatic ecosystems that lie outside of the protected areas.

4.1 Resource Background

Burundi is a small landlocked country of 27, 834 square kilometers (about the size of the state of Maryland). Population density is the second highest in Africa with an average of 257 people/km². The country has a variety of landscapes and ranges in elevation from

774m by the shores of Lake Tanganyika to 2670m at its highest peak at Mt. Meha (Figure 7).

Burundi has a tropical humid climate and annual average rainfall ranges from 800mm (in the Bugesera region) to 2000mm (in the Kibira forest) distributed over the year in two general seasons. The wet season is from October through May with a short dry period for a few weeks in January. The long dry season is from June through September. In the last decade there have been observations of an extended dry season in some regions (Kumoso, Bugesera and Imbo) lasting 6 to 7 months (Nzigidahera 2006). Rainfall patterns are further influenced by the local elevation and landforms. The wet season is characterized by intense rainfall of short duration which further aggravates erosion and runoff problems. The climate generally allows for three growing seasons. Temperature varies with elevation and annual average temperature ranges from 23°C from the plains of Imbo to 16° C on the Congo-Nile Crest (Ndumumwami 2004)

Figure 7: Topography of Burundi (Source: IGEBU)

The country is divided into two major river basins; the Congo and the Nile. The Nile-Congo crest runs north-south through the western end of the country and all drainages west of the crest flow into Lake Tanganyika and eventually into the Congo. The eastside of the crest drains towards Lake Victoria and the Nile River. Due to its numerous hills and varied relief, the country is highly dissected and contains a dense network of small drainages (Figure 8). The country can be grouped into five geographical regions; the western plain of the Imbo, the western escarpment of the Mumirwa, the crest of the Congo-Nile, the high central plateau, and the eastern plains which include the depressions of the Kumoso in the east and the bowl of Bugesera in the northeast.

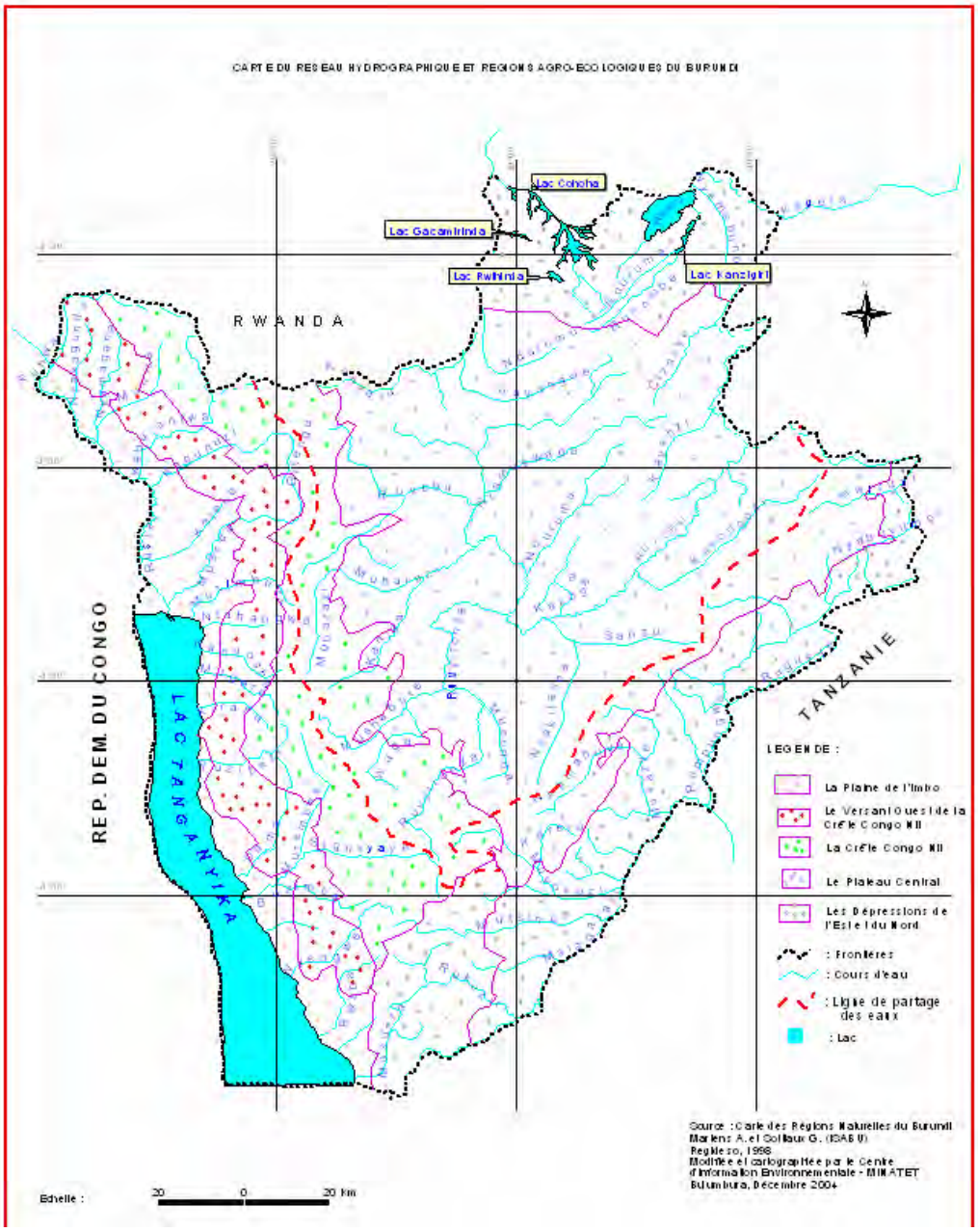

Figure 8: Hydrologic map of Burundi

Outlined below is additional information for some regions of concern.

- Slopes on the western escarpment of the Mumirwa can vary from 70% to more than 100% and are prone to very high erosion including landslides and gullies. Population density in this region is very high (300 people/km²).

- The high central plateau represents 52% of the country and elevation varies from 1350 m to 2000m. The central plateau is crisscrossed by a dense network of stream drainages. There are numerous hills that are often separated by wide valleys. These areas contain extensive bottomlands that are being intensely cultivated. The population density is very high in the central plateaus and in certain areas it is greater then 400 people/km².

- The eastern plain that forms the depressions of Kumosa and Bugesera in the northeast, represent about 16% of the country. The soils are not very fertile and are susceptible to erosion and gullies. This area also contains the vast inland lake ecosystem. The population density is approximately 120 people/km² (Mbonerane 2004).

4.2 Issues and Challenges

Over the course of the mission the USFS team identified the following primary issues related to the state of the country's natural resources and the ongoing efforts to effectively manage and conserve them. As with the land policy and conflict issues, these were identified through field visits; discussions with Burundian government representatives, US government officials in Burundi, and NGO representatives; as well as through reviews of the existing data and literature we were able to locate.

All of the issues in this section relate to overexploitation of the natural resources base. The limited existing natural resources are the result of many years of exploitation throughout the recent history of the country. But the recent degradation, due to pressures brought on by the civil war and the prolonged population growth, has exacerbated the loss of resources which requires immediate and large scale restoration efforts.

4.2.1 Deforestation and degraded forestland

The Government of Burundi undertook a large reforestation program starting in 1978 in which 55,000 hectares were planted. As a result, in 1992 the amount of forestland made up 8% of the land base.

During the past 10 years deforestation rates have risen dramatically. In the decade of the 1990's Burundi had an annual deforestation rate of 9% according to the FAO's State of the World's Forests report (2005), the highest in the world. Some of the cutting occurs in the plantations established in the 70's and 80's as planned harvest, but the majority of the deforestation is in open access forestland and in protected areas.

Figure 9: Burundi's forest resources have been depleted over the years, due in part to a large population's demand for charcoal (photo: J. Evenden)

There are many factors that contribute to the deforestation and degradation of forestland. Some groups and individuals are using forested areas (including parks and reserves) as the main source for income generation and wood products (Nduwumwami, 2004). Firewood is not only used in the home, but also used for charcoal making, brick making, palm oil extraction and other small industrial uses. Wood products are also used for furniture and construction materials. Another major cause of deforestation is conversion of forestland to cultivation or pasture due to population pressures and a strong dependence on agriculture for livelihoods. Yet another devastating effect on forests are the numerous wildfires that are started from the prevalent practice of burning pastures to provide a short term flush of nutrients for new growth. This practice is not only destructive to forestland but in the long term is also detrimental to the soil fertility of the pasture and grasslands.

The assessment team reviewed some successful watershed pilot projects sponsored by the GOB and various donor agencies (such as the Maramvya Colline). These efforts successfully used agro-forestry native and non-native species, contour planting of fodder for erosion control, reforestation of hills owned by the state, established local nurseries, and used other successful community participatory efforts. Some of the reason for limited success in other areas was the local transportation cost to retrieve "free" trees, lack of guidance to manage forestland after it had been planted, no relief from agricultural land pressures and increasing need for firewood.

Figure 10: Burundians are heavily dependent upon forest products for fuel wood and construction materials (photo: C. Athman)

4.2.2 Degradation and loss of protected areas

Protected areas make up just 4.5 % of the land base in Burundi (Figure 11). They are divided into 4 categories: National Parks, Natural Reserves, Natural Monuments and Protected Landscapes. The largest protected areas, Kibira and Ruvubu, were designated as national parks in 1980[7]. The most recent additions to protected areas are called Protected Landscapes which include forested tracts intermixed with privately owned agricultural lands. The concept of the Protected Landscape is to integrate the local community into the protected areas to manage the landscape without degrading it. Managing the Protected Landscapes has had mixed success due to economic and land pressures.

It's been reported that the Kibira and Ruvubu National Parks have suffered from deforestation and severe degradation. In addition, the Bururi, Rumonge and Kegwena Forest Reserves are also being degraded.

Deforestation of protected areas has been on the increase since the war started in 1993. In addition to land pressures and the need for firewood, the existence of rebel and military groups inside the protected areas also caused degradation and deforestation through voluntary burning and clearing to expose opposing forces. In particular, large tracts of the Kibira National Park were deforested as well as portions of the Rusizi Natural Reserve in the Akayobera sector (Mbonerane 2004).

[7] The Kibira National Park had previously existed as a Forest Reserve since 1933.

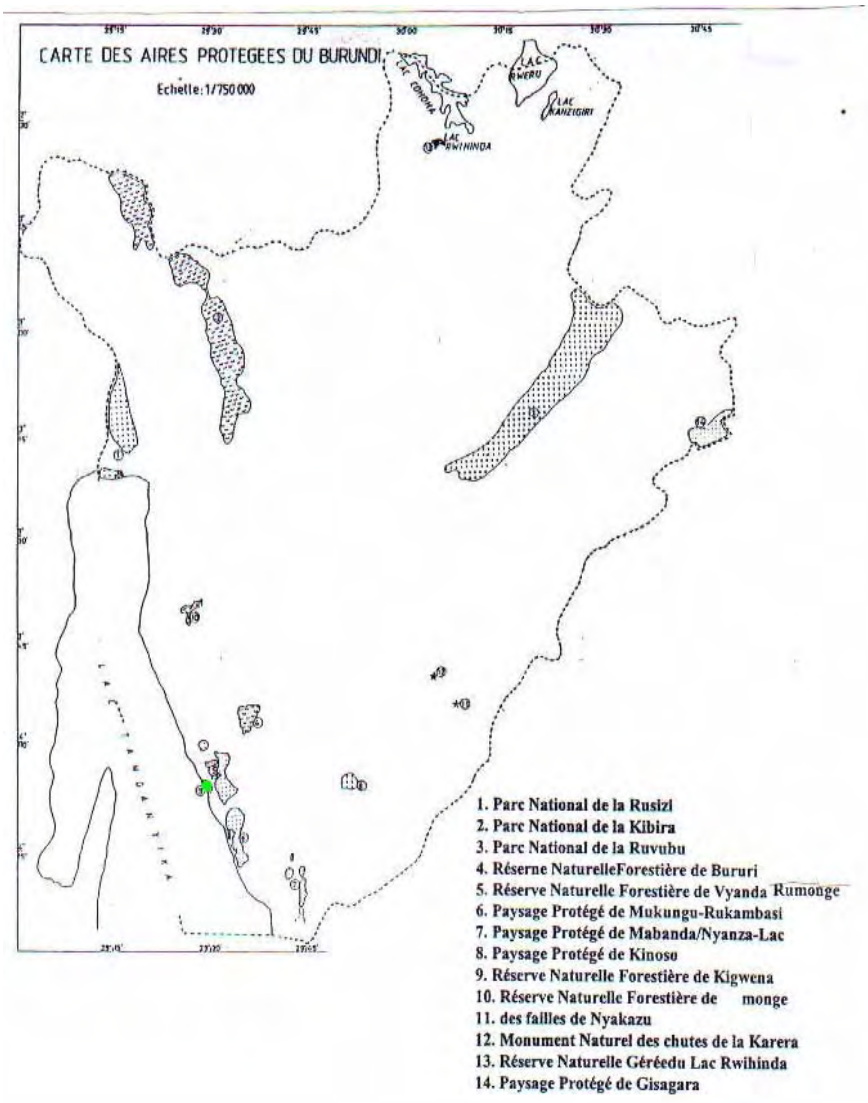

Figure 11: Protected Areas of Burundi, including protected landscapes, covering 4.5% of the country's land base (Source: INECN).

Northeastern Burundi is endowed with several lakes of vital importance for local livelihoods and biodiversity, including Lac Cohoha and Lac Rweru, both shared with Rwanda, as well as the Lac aux Oiseaux. The only lake that has protected status is Lake Rwihinda as a Natural Reserve (Ntakimazi 2006). During the years of war that began in 1993 people began encroaching on previously enforced buffer zones around these lakes to the point that cultivation now occurs right up to the water's edge. This more intensified agriculture is impacting water quality, flow regime and the fish stocks in these lakes, as well as diminishing nesting and foraging sites for birds. The large wetland/lake complex in the Bugesera stores the runoff from the wet season and releases it slowly during the dry season (Ntakimazi 2006). The Government of Burundi is reportedly planning to establish a Protected Landscape in the border region, between lakes Cohoha and Rweru.

Figure 12: The Lac aux Oiseaux in Kirundo Province. During the years of conflict, cultivation expanded all the way to the lake's edge (photo: M. Chaveas).

4.2.3 Soil erosion, loss of soil fertility and sedimentation in aquatic systems

Agricultural productivity declined in the years during the war and production continues to decline. Burundi had traditionally been self-sufficient in food production prior to the conflict. For example, in 1997 agricultural output was reduced by 21% when compared with the average output from 1989-93. Agricultural production is subsistence oriented, except for such cash crops as coffee, tea, rice, sugar and cotton that target export markets (Nduwumwami 2004).

Cultivation and overgrazing on marginal lands are increasing due to population pressures, drought, and loss of soil fertility. Cultivation on steep hill slopes (without erosion protection measures) and cultivation of wetlands are of major concern. Erosion from the hillsides and cultivation adjacent to streams contribute sediment to the streams, lakes and wetlands. This in turn reduces the aquatic productivity and habitat for fish and other aquatic dependent organisms. The assessment team witnessed thousands of hectares of cultivation on steep hillsides with nonexistent to little erosion control practices in place.

Cattle overgrazing on forestland, grasslands and adjacent to streams and wetlands (riparian areas) is also rampant and contributes to soil erosion and sedimentation due to compaction and loss of vegetation. Overgrazing also affects water quality and loss of biodiversity in riparian areas[8]. In Burundi cattle are considered status symbols and while the local people in rural areas tend to these animals, they are rarely the owners of the cattle, but rather are paid to care for them by the owners who often live in larger towns away from their animals and the resources that are being heavily degraded due to overgrazing.

[8] Riparian areas that retain intact natural vegetation provide critical habitat and erosion protection to aquatic systems that include streams, rivers, lakes and wetlands.

Sedimentation in the waterways, wetlands, inland lakes and Lake Tanganyika are of major concern due to loss of fish and wildlife habitat, filling of channels and lakes and pollution due to sediment acting as carries of nutrients and other pollutants. A UNDP (Nkotagu and Mbwambo 2000) study conducted just south of the Burundi border in Tanzania, compared sediment produced from two watersheds, one containing the Gombe National Park and one impacted by agricultural practices on the hillsides of Lake Tanganyika (with similar soils, slopes and practices to many areas in Burundi). They concluded that suspended sediments may be considered the lake's major pollutant and possible carriers of other pollutants. The highly impacted agricultural watershed had suspended sediment rates a magnitude higher than the protected reserve.

Figure 13: Fish drying in the sun outside of Bujumbura. Lake Tanganyika fisheries represent an important protein source for the people of Burundi (photo: J. Evenden).

4.2.4 Loss of wetland /marshland[9]

The wetlands, which are state owned, covered more than 112,000 hectares in 1992. Despite the fact that they are state owned, existing laws are not enforced when trespass occurs and individuals cultivate and graze these sensitive areas. A current inventory was not available, but by all visible accounts, the vast majority of riverine associated wetlands and valley bottom wetlands that are not in a protected status are currently being cultivated. The land pressure and drought have been factors in the increased cultivation of wetlands (Figure 14). With the onset of drought, the government of Burundi encouraged people to develop and cultivate these wetlands, charging a nominal fee of two Burundian Francs (less then 1/5th of a US penny) per square meter per year to cultivate this land in

[9] Wetland and Marshland terms are used interchangeably in this document. The term marshland was a common term that was used in Burundi as a reference to wetlands.

order to remind people that it remains under government ownership. Many landowners now move to the valley bottom wetlands during the dry season to extend their production season because their agricultural base on the upper slopes has declined.

Figure 14: The cultivation of wetlands has become widespread and been encouraged by the government in response to droughts (photo: M. Chaveas).

In addition, government and donor organizations promote agricultural programs that encourage more efficient irrigation channels through wetlands to enhance cultivation in these areas. In some cases these are the same organizations that promote biodiversity measures. Wetlands are a critical link to biodiversity by serving as a transition between terrestrial and aquatic ecosystems. They support habitat for birds, wildlife, amphibians, fish, insects and plant life that is not found in other ecosystems. In addition, many birds, fish and wildlife use these important habitats for a part of their life cycle, even if they do not reside in the wetlands permanently.

A common concern that was heard in reference to cultivation of bottomlands[10] is the worsening phenomena of alternate drying and flooding cycles in these areas. This phenomenon may be due to changes in weather patterns or it may be due to a large-scale decline of wetland and floodplain function in the basin. As extensive wetlands are drained and floodplains undergo intensive cultivation, they no longer are able to function as a flooding regulatory mechanism. Wetlands store floodwaters and release them at a slower rate than agricultural areas or wetlands that have been converted to irrigation canals and cropland. Floodplains that have been severely altered by removal of vegetation, increased drainage efficiency from canals and increased compaction from cultivation also alter the timing and extent of flooding through reduced soil infiltration and storage of floodwaters. This could be especially important in climates that receive

[10] Bottomlands are a common term used in Burundi that refers to floodplains and sometimes includes wetlands.

intense rainfall of prolonged duration, such as Burundi. Increased erosion and sedimentation to waterways are also increased from the cultivation of wetlands and floodplains.

Wetlands surrounding the inland lakes of the northern region are also being lost at a rapid rate to cultivation. The same problems described above including increased erosion and sedimentation to the lakes, loss of habitat for birds, wildlife, fish and amphibians and loss of biodiversity are of particular concern to these unique wetlands.

4.2.5 Other related issues:

Mining of common minerals - in particular for brick making

The team witnessed extensive brick quarrying on hillsides, along floodplains, on channel banks and in wetlands. Sand was being excavated from stream channels for roadwork as well. These indiscriminate quarries are sources of sedimentation from gullies, bank and channel erosion and floodplain erosion and represents a serious loss of soil and soil productivity. Some of the stone/rock quarries are on state owned land and some fall under municipal authority management and the users only pay a communal tax. . The majority of the clay excavations occur on private land where the extractors pay the land owner in addition to a commune tax. There are no controls, no rehabilitation nor apparently anyone responsible to enact either of these. The exception is some private sites located in cultivated wetlands, are sometimes rehabilitated by the landowners. (Nshimirimana 2005).

Figure 15: Soil excavation for brick making is widespread throughout Burundi, leaving obvious scars throughout the countryside (photo: M. Chaveas).

Water pollution from palm oil production

Palm oil production and extraction requires large volumes of water in the process. The small artisanal operations are located next to streams and the residue and oils from the palm oil processing and from a secondary production of soap are all dumped into the

streams adjacent to Lake Tanganyika. The pollution has caused fish kills and is detrimental to areas in the streams where the fish lay their eggs. In addition there are large palm plantations which were planted in the 1980's and are currently at the end of their productive life span. These plantations which are all the same age will need to be re-planted soon if the region is to maintain this economic activity. The loss of these plantations will have a large economic impact on this part of Burundi as well as deforestation and erosion potential on thousands of hectares. No apparent plan exists for the productive future management of these lands.

Impacts from climatic change predictions

In response to the Burundi ratification of the United Nations framework of Climate Change in April 1997, the Geographical Institute of Burundi (IGEBU) modeled a climate change scenario for Burundi. Predictions indicate that in the period from 2000-2050, there will be a constant rise of the average air temperature of 0.4 °C every ten years. This will increase average air temperatures by 1.9° C by 2050 and increases will be more significant during the dry season from May to October.

Rainfall average for the year will increase slightly and range from 3-10%. However, specific changes by season indicate that during the months from November to March rainfall will increase > 25% during the rainy season. Alternately, there will be a decrease of 4-15% in rainfall in the dry season from May to October (Sinarinzi 2005).

These climatic changes would exacerbate many of the issues already described including increased flooding in altered floodplains and wetlands and increased erosion from hillsides and streamsides. Forest and agriculture production could increase due to higher rainfall during the rainy season, but only if proper resource management and erosion control measures are enacted to counter the effects of land use pressures and poor agricultural practices already described.

Loss of spring source water supplies

The amount of population that has access to suitable drinking water from 1998 to 2003 declined from 53% to 43% (Sinarinzi, 2005). Loss of infrastructure from the war is a large factor; however loss of springs may also play a role.

Springs which serve as water supply sources are drying up across the country according to anecdotal evidence. For a large number of local communities, the springs coming from the hillsides are the main water supply source. The evidence of spring sources drying up could not be substantiated due to poor record keeping and lack of inventory data, however many communities are reporting that this has occurred in the last several years. There are likely several contributing factors, one of which could be the extensive change in land practices that has occurred over the last 15-20 years. As the hills and other sensitive groundwater recharge areas have been converted to grazing and agricultural land, the deep infiltration to shallow groundwater (some which form hillside springs) has been altered through increased compaction. The rainfall that used to easily penetrate through the forest duff layer is now restricted to surface runoff.

Another factor that may be changing spring flow is the drought that has been occurring for the past 10 years. Cultivation of wetlands in the higher elevations may also be contributing to groundwater changes.

Road erosion
The main highway system in the country was paved in the 1980's. The drainage system from these roads contains an elaborate rock-lined ditch. This efficient system, while it reduces ditch erosion, contributes large volumes of high-energy flow from the road ditches and directs water to the steep unprotected side slopes. There are many gullies evident from ditch outlets along the hillsides, although often hidden by the lush re-growth and planting of bananas and other crops in the gullies and ravines due to land scarcity. However, many of these gullies and ravines are still likely actively eroding and contributing to soil loss and sedimentation, although the team was not able to assess this during the trip.

Many of the secondary unpaved roads that traverse the hills are poorly designed and are not ditched. These roads which are severely compacted with no proper drainage continue to erode and cause deep rutting on the road surface. During the rainy season runoff from severely eroding roads can be a large source of sedimentation to waterways.

4.3 Recommendations

Many of the recommendations suggested below are interconnected and inter-dependant. Some recommendations would be most successful if implemented in coordination with others i.e.; large-scale reforestation of forests for community use will be needed to successfully protect any buffers established around reserves and to protect the reserves.

4.3.1 Deforestation and degraded forestland

Short Term Recommendations

1. Conduct a National Land Management Plan that would address large-scale reforestation and provide national guidance on areas of prioritization. Planning should be done immediately and within a short period (no longer than 6 months) to provide prioritization for reforestation needs. Planning should utilize the Geographical Information System (GIS) maps that are currently available through IGEBU for a variety of resource layers. Resource layers and base maps should be updated as inventory and information becomes available. Provincial and/or community level plans would follow and include local stakeholders.

   Prioritization for reforestation should be given to:
   - Buffers around reserves and protected areas
   - Hill and areas where springs are declining or depleted
   - Erosive hillsides adjacent to rivers, lakes and wetlands
   - Steepest slopes and poorest soils
   - Highest density areas where firewood is most needed

2. Large-scale reforestation can be accomplished by using both a government works program and a community participatory program. The government works programs have been successful in the past and could include food/cash for work, land or conservation credits for work and youth reforestation groups (similar to mandatory weekend work programs already established in the country). In addition, community participatory programs such as the forest protection associations, described in more detail below in the Protected Area Management section, should also be an integral part of the reforestation effort.

   Some considerations for successful large-scale reforestation include:

   - Conduct a short-term search for the most successful forest and agro-forest termite resistant species available for immediate large-scale reforestation. Consideration should be given to native species and successful nonnative species as well. Look to tropical forestry experts and experiences from surrounding countries. The *immediate* short term need for wood products and re-establishing forest cover is greater than the long-term need to provide reforestation of native species.

   - Consideration should be given to the ecotype and previous native vegetation type i.e., exotic conifers should not be planted in areas that previously supported savannas.

   - Select suitable species for elevation and climatic zone. A broad leafed forest that loses its leaves in the dry season should not be planted to conifers that use much more water due to year round evapotranspiration.

   - Monocultures, especially of nonnative species, should be avoided.

   - The successful interplanting of nonnative species (i.e., *Termininalia superba*) in the degraded Kigwena Reserve should be considered for other degraded forested areas, while some of the existing overstory and microclimates are still intact.

   - Provide tree species that are nitrogen-fixing to improve soil fertility

3. Coordinate between the Ministries of Environment, Mining (water supplies and quarries), and Agriculture and Livestock, as well as donor organizations when framing national land management plans and during the implementation of programs.

Long Term Recommendations

1. Re-establish research on reforestation of native species that was suspended during the conflict.

2. Provide forest management guidance for reforested areas both in local plans and in extension programs.

3. Improve institutional capacity to provide trained staff to support the necessary planning and implementation of forestry, watershed and protected area management.

4.3.2 Degradation and loss of protected areas

Short Term Recommendations

1. Conduct a national land management plan for protected areas to provide guidance and consistency. Follow up with detailed management plans for individual Protected Areas to address their unique character and issues. These plans should be started immediately and completed within a short time (less than 6 months). The individual protected area plans should involve the local community and stakeholders.

2. Create buffers around Protected Areas. Forest Reserves buffers should be reforested to allow greater protection to reserves. The protected lake buffers should include the wetlands that surround the lakes.

   Add the border region, between lakes Cohoha and Rweru area to Protected status as planned.

3. Provide large scale expansion and support existing forest associations such as the Murmavya's Association Femme - Environnement au Burundi (AFEB) which helps protect the Kibira National Park (Figures 16 and 17). They are a highly successful association of 1350 women and 150 men whose objectives include, establishing tree nurseries to practice agroforestry on family lands and to reforest government land, receiving a 70 % revenue from management of reforested areas, learning other small trades such as mushroom cultivation, beekeeping and raising goats, serving as law enforcement's eyes and ears for any cutting in the Reserve, being sensitized to the environmental concerns, and finally empowering women to establish the long term productivity and economic stability of their family land. There are four other associations in the country, although much smaller, which are currently supported by the Nile Basin Initiative and the National Institute for the Environment and the Conservation of Nature (INECN).

   These associations should serve as models for similar participatory community forests nation wide, to support and protect designated parks and reserves, and to also serve as models for community forest areas incorporating agroforestry and conservation practices on private land.

4. Protect a portion of Lake Tanganyika that supports the only rocky shoal along the western edge of the lake and is critical spawning habitat for the endemic fish species.

Figure 16: Members of the Association Femme - Environnement au Burundi (AFEB) in Muramvya working at the association's tree nursery (photo: M. Chaveas).

Figure 17: The AFEB tree nursery with the Kabira NP in the background (photo: M. Chaveas)

5. Add Protected Landscapes along the steep southwestern hills along Lake Tanganyika from Rumonge to the southern border to reduce sedimentation to the lake and to protect remnant forested land and forest habitat.

6. Assess special forest product fees for forest products that are collected in the reserves and exported, such as butterflies in the Kegwena Reserve. All revenues

should be returned for reserve management and support to the local communities to encourage community enforcement.

7. Provide law enforcement that is appropriately paid and provide adequate performance based incentives to dissuade corruption.

Long Term Recommendations

1. Eco-tourism opportunities appear limited at this time, but as government stability continues in the long term, the potential to develop this sector exist. Land management plans should include future plans to accommodate, protect and economically benefit from the ecotourism. The private sector should be engaged to advance the associated tourism opportunities and economic potential. However, revenues which come from the reserves should be reinvested in the reserve management and support the local communities. Current fees for admission to the Rusizi National Park are drastically under-valued.

4.3.3 Soil erosion, loss of soil fertility and sedimentation in aquatic systems

Short Term Recommendations

1. Incorporate lessons learned from successful watershed pilot projects (Marmuvya Colline) and apply to large-scale efforts across the country. Establish community forest on hill tops and steep slopes and apply agricultural conservation practices on the midslopes and valleys. Establish community forest/watershed associations as described in the Protected Areas recommendations.

2. Enforce grazing exclusions on marginal lands. Sensitize population to grazing problems, including the cattle owners. Establish specific water access sites for cattle to streams or lakes to prevent indiscriminate compaction and removal of riparian vegetation.

3. Diversify crops and evaluate environmental effects of encouraging large scale rice production on the wetlands and floodplains for areas of the country that have severely degraded watersheds and altered flooding regimes.

4. Encourage reforestation and revegetation of native species in riparian areas along streams. Discourage cultivation along stream banks.

5. Designate state quarries as community managed quarries for brick making and enforce the management. Revegetate old quarries in floodplains and designate areas outside of floodplains. The assessment team was told of the limited use of brick-making devices that do not require firing. If effective, these devices should be disseminated more widely and their use encouraged.

Figure 18: Impacts of overgrazing on the land in Kirundo Province (photo: M. Chaveas)

6. Assess the extent of road drainage erosion problems from both paved and unpaved roads. Provide training for improved road building and drainage techniques for unpaved roads.

4.3.4 Loss of wetland/marshland

Short Term Recommendations

1. Establish protection for some remaining wetlands along lakes, river and hillsides to retain biodiversity features to serve as reference conditions for future restoration projects. It's important not only to retain these unique features for their inherent benefits now, but if the vegetation, hydrologic regime, and habitat features are completely destroyed, recreating any of these features in the future would be more difficult.

2. Conduct a pilot restoration project to restore some wetlands in association with other hillside conservation projects and monitor to determine success of restoring wetland habitat and function.

3. Sensitize public and government on importance of wetlands to biodiversity and watershed health. Build ministry staff capacity to accommodate effective wetland protection.

4. Coordinate planning and implementation between the various Ministries responsible for Environment, Mining (water supplies and quarries) and Agriculture to establish a holistic approach to watershed conservation practices and biodiversity concerns. Coordinate among donor agencies programs that may have conflicting objectives.

Figure 19: The Ruvubu River in Ruvubu National Park (photo: M. Chaveas)

4.3.5 Other related issues

1. Conduct spring source water supply inventory of existing and depleted sources. Coordinate data sharing between Ministries.

2. Enforce existing laws in regards to quarries and clay excavation on floodplains and in channels. Provide management plans for state owned quarries.

3. Utilize palm oil production solid residue for other uses such as mushroom compost. Include management proposal for future land use or reforestation of palm oil plantation in the national land management plan proposed above.

5. SUMMARY OF KEY RECOMMENDATIONS (With page numbers of the report where more detail can be found)

	Land Policy and Conflict	Natural Resource Management
Short Term	1. Develop strategy for those "living without land", promoting economic transformation to non-agricultural income (pg 13)	1. Conduct a National Land Management Plan, addressing large-scale reforestation, efficient use of agricultural lands and the management of protected areas (pg 28/30)
	1.1 Expand trade, technical, and vocational job training facilities (pg 13)	2. Large-scale reforestation through government works program and a community participatory program (pg 29)
	1.2 Prioritize training and support as means to resolve land disputes (pg 14)	3. Coordinate between the Ministries with NRM responsibilities and donor organizations, when framing national land management plans (pg 29/33)
	1.3 Create voluntary pilot villages (pg 14)	4. Create buffers around Protected Areas (pg 30)
	1.4 Implement family planning, education and economic incentive programs, focused on improving women's rights (pg 14)	5. Provide for the large scale expansion and support of existing locally based forest associations (pg 30)
	1.5 Integrate effective environmental education programs into school curricula at all levels (pg 14)	6. Provide law enforcement that is appropriately paid, with adequate performance based incentives (pg 32)
	2. Resolve land conflicts quickly for returning refugees and provide legal services (pg 14)	7. Incorporate lessons learned from successful watershed pilot projects and apply to large-scale efforts across the country (pg 32)
	2.1 Support community-based paralegals and mobile legal clinics (pg 14)	8. Enforce grazing exclusions on marginal lands (pg 32)
	2.2 Assure consistency and avoid duplication of efforts and resources between government and NGOs (pg 14)	9. Diversify crops and evaluate environmental effects of encouraging large scale rice production on the wetlands and floodplains (pg 32)
	2.3 Establish and communicate best practices for mediated settlements (pg 14)	10. Encourage reforestation and re-vegetation of native species in riparian areas (pg 32)
	2.4 Inventory cases heard, and document success rates and lessons learned (pg 14)	11. Establish protection for some remaining wetlands along lakes, river and hillsides (pg 33)
	3. Keep settled IDPs in place, where it makes sense (pg 14)	12. Conduct pilot restoration projects on wetlands in association with other hillside conservation projects (pg 33)

		13. Conduct spring source water supply inventory of existing and depleted sources (pg 34)
		14. Enforce existing laws in regards to quarries and clay excavation on floodplains and in channels; re-vegetate old quarries (pg 34)
	Land Policy and Conflict	**Natural Resource Management**
Long Term	1. Finalize the Land Code, policies and regulations in an open and transparent process (pg 14)	1. Re-establish research on reforestation of native species (pg 29)
	2. Establish a formal landownership record system (pg 16)	2. Provide forest management guidance for reforested areas (pg 30)
	3. Encourage the international community to continue to develop placement alternatives for the hundreds of thousands of Burundian refugees (pg 16)	3. Improve institutional capacity to provide trained staff to support the necessary planning and implementation of forestry, watershed and protected area management (pg 30)
		4. Land management plans should include future plans to accommodate, protect and economically benefit from the ecotourism (pg 32)

6. POTENTIAL FUTURE ROLE OF THE USFS

US Forest Service technical experts could be taped to provide short term assistance in collaboration with USAID, implementing partner NGOs and GOB Ministries and Departments in order to address some of the recommendations listed above. In particular, some of the aspects USFS technical assistance could support include:

1. In support of the establishment of a formal landownership record system, the USFS could provide guidance, skills and knowledge in establishing a geographic control network for individual parcel identification, and developing standards and field techniques for parcel corner location and monumentation. This approach could be tested on a small-scale basis in a setting where there's strong local involvement and commitment.
2. Assistance in the development of framework for national land management plans, management plans for the protected area network and for individual protected areas, and community land use planning.
3. Assist in the development of improved watershed-level resource protection efforts including nurseries, reforestation, and erosion controls.
4. Assistance in the design and implementation of wetland protection projects.
5. Assessment of spring water source conditions and design of inventory and monitoring procedures to gauge water flow quality and quantity over time and make recommendations on improving water delivery systems.
6. Establishing improved NRM law enforcement structures, policies and procedures.

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APPENDIX A: Mission Itinerary

Schedule for the visit of the US Forest Service International Programs team
September 11 – 21st, 2006

Monday, September 11, 2006

8:10 Arrival at Bujumbura International Airport.

8:15 - 8:40 Installation at Botanika Hotel.

10:00-11:30 In- house Security briefing at the Embassy

11:35 In- house meeting with the US Ambassador and the DCM/ *at the embassy*

15:00 Meeting with the Minister of Environment. The DCM to accompany the team / *at the Ministry of Environment*.

Tuesday, September 12, 2006

8:30-11:00 Working level meeting with representatives of the Ministries of Environment, Agriculture and Public Works to discuss existing National laws/ policy related to land tenure and property rights

14:00-16:00 Working level meeting with representatives of Global Rights, CARE, CRS, AFRICARE, World Vision, RCN (Reseau Citoyen Network), CED-Caritas, OAG (Observatoire de l'Action Gouvernementale), ABO (Association pour la Protection des Oiseaux) to discuss same topic as above

16:00-17:00 Meeting with the USAID Burundi Program Manager, Laura Pavlovic

Wednesday, Sept. 13, 2006 : Bujumbura– Rumonge– Bururi *(106 km on RN3, RN16)*

7:45. Driver to pick up the environment team at their respective offices

8:00 **Depart Bujumbura** (from Botanika) **to Rumonge**.

(*73 km, on the RN 3*; *Route: Bujumbura- Kabezi- Minago- Magara- Resha- Rumonge*)

Bujumbura-Rumonge road follows the Lake Tanganyika shore southwards.
The lake Tanganyika is the second largest fresh water lake in the world and a natural habitat for a wide variety of fish and other fauna and flora species. The quality of water varies from less populated areas (Ex. RESHA) to more populated areas (Ex. RUMONGE town) where water is more polluted. The area near RUMONGE is a very fertile land with

a history of administration backed massive illegal allocations of land and in consequence many sensitive cases of land conflicts.

The team will stop over at Resha, at Rumonge center, at the Romonge Natural Reserve and at Maramvya colline: *a pilot site for a government watershed development and reforestation initiative*.

11:35 **Depart Rumonge to Rutovu** (~57 km)

Burundi is divided into 2 water basins; the Nile (48% of the territory) and the Congo (52% of the territory). Rivers feeding the 2 basins have their origin in the Gihinga and Inanzegwe mountains; both located in Rutovu commune. The most southern source of the Nile River is also considered to be in Rutovu.

The team will see: -the "source of the Nile", the water dividing the Nile basin and Congo basin; Gihinga & Inanzegwe crests and how they have become bare, hills where the Ministry is doing reforestation.

16:00 **Return to Bururi Centre** (47 km) (Lodging at Phoenicia Hotel)

16:30 Meeting with Bururi Governor

<u>Thursday, September 14, 2006: Bururi – Makamba –Rutana – Gitega</u>

8:00 **Depart Bururi Centre to Makamba via Rumonge** (110 km, on RN3) (Route: Bururi – Romonge (34 km); Rumonge – Makamba (76 km))

Makamba Province is located on the south-western border with Tanzania, an area with significant flows of refugees and /repatriates and consequently a lot of land conflicts. The government's efforts to protect natural forests (ex. MUKUNGU, NYANZA-LAC) conflict with illegal appropriations by neighboring populations. Causes of deforestation in that region include setting fires on land in search of fresh grass for the cattle. The province is faced with dryness of water sources.

Along the road the team will see: - the Mukungu and Nyanza-Lac natural forest
-Kibimbi hill, completely made bare by fire
- Plots reforested by the Forest Department

- Local administration will be available to discuss land conflicts

11:00 *Meeting with Makamba Governor to discuss land conflicts and deforestation problems. (TBC)*

12:00 Lunch at Haston Villa

13:30 **Depart Makamba to Rutana Province** (65 km, on RN8)

Between Makamba and Rutana there is a savannah (between Makamba and Kayogoro) a scrawny forest and ravine (between Kayogoro and Bukemba) landscape. Reforestation in that area is an issue because of the soil characteristics: a lot of termites make it difficult to find resistant species.

Depart Rutana to Gitega (73 km, on RN8)

Along the road, the team will see:-land degradation, deforestation and exploitation of marshlands as an alternative to scarcity of cultivable land.

16:00 Arrival in Gitega centre. Installation at "Etoile du Centre" hotel .

17:00 Meeting with Gitega Governor

Friday, September 15, 2006: Gitega – Muramvya – Bujumbura *(100 km, on RN2, RN1)*

Gitega is located in the centre and is the 2nd largest city in the country. The city is undergoing a rapid and anarchic expansion. High demographic pressures contribute to exhaustion of the land for cultivation.

8:00 – 9:00 Meeting with the Director of the "Département du Genie Rural et de la Protection du Patrimoine Foncier" within the Ministry of Environment. (During this meeting Connie Athman met with the Department's GIS division)

9:00 – 9:30 Meet with Hydrologic Department of Ministry of Mines and Energy to discuss condition of water sources and existing studies on flow rates

9:30 **Depart Gitega to Bujumbura, via Muramvya & Bugarama** (100KM on RN2)

Stop at: - Giheta -12 km from Gitega on the way to Bujumbura. A commune where there are lots of land conflicts.

Muramvya Province is located in the highlands of the country with an important portion covered by the Kibira forest. Muramvya is among the provinces where there has been large scale destruction of both natural and artificial forests, because of security problems but also because Bujumbura is a near market for forest products.

The team will see deforestation along the road and the Mubarazi marshland. Mubarazi is among the longest rivers in the country and feeds may marshlands. Its steep banks are being destroyed by floods.

-Brief stop at Bugarama (20 km from Muramvya and 34 km from Bujumbura)

15:00 Arrival in Bujumbura town; overnight at Botanika

Saturday September 16, 2006

9:30 **Departure for Rusizi Natural Park (~ 18 km from Bujumbura town), visit to Bujumbura Botanical Gardens**

Monday, September 18, 2006: Bujumbura- Kirundo, (*197 Km on RN1, RN14)*

7:45 Driver to pick up the environment team at their respective offices and hotels.

8:00 Depart Bujumbura to Kirundo (Route: Bujumbura-Bugarama-Kayanza-Ngozi-Kirundo)

Kirundo province is known for its many lakes; of which Lac Rweru and Lac cohoha are the biggest. Kirundo lakes, especially Lake Rwihinda, also called "Lac aux Oiseaux" used to host immigrants birds from as far as Europe. Now birds have deserted the area following dramatic drought problems which compelled people to destroy the natural ecosystems around the lakes. Drought in that area has become a constant threat. There are also land conflicts due to refugee's flows across the border with Rwanda.

11:00 *Meeting with the Kirundo Governor*

13:00 Depart Kirundo centre to Busoni commune, to see the lake Rweru, the natural reserve of Murehe and the marshland of Rugarama (~10 Km from Lake Rweru) *where a USAID partner –the Catholic Relief Services NGO works with vulnerable households to increase their agricultural production while protecting the surrounding hills.*

16:00 Arrive in Kirundo centre town- Lodging at Kirundo Guest House

Tuesday, September 19, 2006: Muyinga – Ngozi, (73km on RN6)

Muyinga province is an overpopulated province with the usual problems of cultivable land exhaustion coupled with anarchic exploitation of mines and quarries. Efforts to protect the environment are being undertaken, especially with respect to the Ruvubu National Park. Ruvubu national park includes papyrus wetland, as well as the Ruvubu river- one of the three main rivers of the country- and its tributary habitat. The protection of the park is a source of conflict between the administration and riverside residents. Other causes of environment disruption in Muyinga province is the Congolese refugees camp, established in 2004 in Gasorwe commune. The camp hosts about 8000 refugees needing wood for various purposes.

7:30 Depart for visit to Lac aux Oiseaux

8:00 Depart Kirundo for Muyinga Province

9:30-10:00 Meeting with Muyinga Governor

10:00-14:30 Visit Ruvubu National Park at Buhinyuza (37 km from Muyinga Centre)

15:30 Arrive in Muyinga Centre**.**

<u>Wednesday, September 20, 2006: Ngozi – Bujumbura, (</u>126 km, RN6, RN1)

8:00 Depart Muyinga for Ngozi

Ngozi-Bujumbura road goes through Kayanza Province. Ngozi and Kayanza provinces offer the highest population density of the country, with cultivable land exhaustion and intensive exploitation of marshlands as consequences.
The two provinces have also developed an intensive commercialization of bricks and tiles, often along the main road for obvious reasons of easy access. So land degradation is even more noticeable along this road.

9:30 Meeting with Ngozi Governor

10:00 Meeting at CARE offices to discuss ongoing research on land use conflicts

11:00 Depart Ngozi to Kayanza (32 km).
See: Nyakijima marshland along the road and a lime extraction site at Kigufi marshland (1 km from the main road).

Depart Kayanza to Bujumbura (93 km).
See : local crafts using natural resources in danger of extinction at Gatara -tile and bricks making and their effect on the environment in Matongo commune.

While crossing the Kibira forest, the biggest natural forest of the country and main source of water for the Nile and the Congo basins, see degradation and illegal appropriation of portions of the forest and just before entering the Bujumbura city, see whole hills eaten up by quarry exploitation.

14:30 Arrive in Bujumbura

18:30 – 20:30 Cocktail hosted by the Deputy Chief of Mission at her Residence

<u>Thursday, September 21, 2006</u>

9:30 Team briefs Ambassador and Deputy Chief of Mission

11:30 Pick up luggage by travel expediter

13:10 Departure for Bujumbura International Airport. Take off at 13:50

APPENDIX B: Mission Scope of Work

US Forest Service, Department of Agriculture
Technical Assistance to the US Government Mission in Burundi
on Natural Resource Management and Land Use Policy

Draft Scope of Work – July 2006

1. Background

The US Forest Service (USFS) has developed a great deal of experience in sustainable use of natural resources with 100 years of experience in land management in the United States. Through the International Programs Office of the USFS, the expertise and skills of the agencies 35,000 employees can be accessed to develop or support natural resources conservation and management projects with our partners overseas. As an agency within the Department of Agriculture, the USFS administers approximately 191 million acres (77 mil. ha) of National Forests and Grasslands, managing these lands with a multiple use mandate to provide for conservation, watershed protection, economic activities, and recreation, among other benefits. Additionally, the USFS works closely with state government agencies and private landowners to improve natural resource management on non-federal lands through the agency's State and Private Forestry arm and contributes to improving the scientific and technical knowledge of these resources and their benefits through the Research and Development branch.

As a fragile state, transitioning from years of civil war to more peaceful and hopeful times, Burundi faces many challenges regarding the management of its natural resources, which support a very densely populated country. The years of war in Burundi and the larger region have led to a large number of refugees and internally displaced peoples with no clear land tenure or property rights who, as a result, are rapidly degrading the existing soil, water and forest resources while attempting to meet their basic needs for food, fuel and shelter. Additionally, weak land tenure and property rights systems and murky property rights threaten to undermine the progression towards peace and cause renewed conflict in the country.

Due in part to these land tenure issues, Burundi is facing a number of challenges to the health of the country's environment. Widespread deforestation from exploitation for firewood, charcoal and construction materials is rapidly degrading the remaining natural forests and the biodiversity dependent upon those ecosystems. With a population density of around 300 people/km^2 in much of the country, family agricultural plots average less then ½ a hectare in size and are often fragmented. This heavy pressure on the land is impacting soil fertility and leading to heavy erosion, while wetlands are being drained to accommodate ever increasing populations.

In order to assist the US Government mission in Burundi, the USFS will send a technical assistance team to work in collaboration with the US State Department and USAID. This team will focus on performing an assessment of existing natural resource management and protection activities and their impacts on Burundi's biodiversity, and of the national

level policy initiatives dealing with land use and property rights in the country. This assessment will provide recommendations on improving land use policies for the country and evaluate ongoing resource management projects, as well as recommend new areas of potential intervention which will aid in securing the long term sustainability of these resources.

2. Level of Effort and Team Composition

The USFS team will consist of three members; a forest ecologist with experience on the social impacts on forest resources; a land use policy expert; and a representative from USFS IP. This team will travel to Burundi at an as yet to be agreed upon date (likely in late August or September) for a period of approximately two weeks and will be joined for to-be-determined periods by USAID, Embassy Bujumbura, and possibly GoB or other counterparts.

2. Objectives

The objectives for this USFS mission to Burundi are as follows:

1) Assess the impacts of existing land tenure and property rights policies on natural resource protections and the potential impacts, or changes to the impacts, that the new national land policy may have.
2) Propose specific interventions, impact studies, and/or amendments to land tenure and property rights policies and laws that could improve the management of natural resources in Burundi.
3) Assess the effectiveness of ongoing resource management and biodiversity conservation activities in north-eastern Burundi, providing guidance on evaluating and monitoring the impacts of the forest and watershed protection, soil conservation and community reforestation efforts taking place in-country.
4) Provide recommendations on improving these existing interventions and on the need for additional interventions in areas of the country with no ongoing natural resource or biodiversity protection efforts.

3. Tasks

#1: Recruitment, selection, and mobilization of a USFS technical assistance team:

a) Recruit a forest ecologist with a working knowledge of hydrological processes and effective soil conservation practices and who is experienced in the area of social forestry and the management of subsistence use of forest resources;

b) Recruit a land use policy expert with experience dealing with land tenure and property rights issues and their impacts on natural resource management.

An effort will be made to recruit team members with French language skills. However, if necessary, preference will be given to technical skills and level of experience over language skills, as the team will be accompanied by a USFS IP staff member who is a French speaker.

Responsible party: USFS

#2: Working with Government of Burundi representatives, US diplomatic mission employees, and implementing partners, examine the existing land tenure and property rights policy and legal structure and the proposed reforms to these policies/laws. Provide insight on the impacts these policies/laws, or lack of them, are having on the management and conservation of natural resources in Burundi and how those impacts may change over time. Provide recommendations on potential changes to these policies/laws and on issues that are not currently addressed at the national level, but should be.

Responsible party: USFS

#3: Through field visits to existing projects, assess the effectiveness of ongoing natural resource management and protection efforts in north-eastern Burundi and provide recommendations on monitoring the effectiveness of these interventions and on potential new resource conservation activities in this region as well as in new geographic areas in the country. Recommendations should also be provided regarding efforts towards biodiversity conservation in the visited regions.

Responsible party: USFS

#4: In-country logistical support:

- **a)** Inform officials from the Government of Burundi ministry(ies) charged with management of the country's natural resources of the USFS team's arrival and purpose of their engagement in the country and arrange for times when the appropriate individuals can work with the team on national level policy issues.
- **b)** Identify location for field visits and arrange for meetings, or to be accompanied on these visits, by the appropriate implementing partner and/or Government of Burundi representative.
- **c)** Arrange for all in-country transportation and reservations for necessary lodging.

Responsible party: US State Dept/USAID

#5: Prior to the arrival of the USFS team, the US State Department and/or USAID should gather all available and relevant information on the land use policies of Burundi and existing natural resource conservation projects to be assessed by the USFS team, allowing them time to review these documents and adequately prepare for the work to be done while in-country. As much as possible, this information should be sent to the USFS team electronically prior to their arrival. Any documents not available in an electronic format should be made available to the team upon arrival.

Responsible party: US State Dept/USAID

4. Deliverables

The USFS team will produce a report detailing activities during the mission and all results and findings of the work toward the accomplishment of those objectives listed above. This report will include but not be limited to:

- **a)** An assessment of the state of Burundi's land tenure and property rights policies and laws, examining, to the extent possible, the impacts these are having on natural resource management in the country. A list of prioritized recommendations should be provided, outlining how each should be approached with the goal of improving national level land tenure policies.
- **b)** An assessment of the effectiveness of ongoing natural resource conservation efforts in north-eastern Burundi and their potential impacts on the country's biodiversity. A list of prioritized recommendations will also be provided, focusing on improving these activities, as needed, and monitoring their level of success.
- **c)** Recommendations on the expansion of natural resource management activities in new parts of Burundi, particularly the south, providing insight on how these activities should be prioritized.

A discussion of resource and technical assistance needs for the effective implementation of the recommendations provided in a-c above, including any future role for USFS technical assistance.

APPENDIX C: Contacts Made

US Embassy, Bujumbura

Ann Breiter	Deputy Chief of Mission
Lewis Carroll	Economic and Consular Officer
Patricia Moller	Ambassador
Erik Olerud	Regional Security Office
Michael Raney	Regional Security Office
Charles Widmer	TDY, Defense Attache's Office

USAID

Radegonde Bijeje	Program Assistant, Bujumbura
Andy Karas	Limited Presence Country Office Director, USAID/EA, Nairobi
Walter Knausenberger	Senior Regional Environmental Officer, USAID/EA, Nairobi
Alice Nibitanga	Program Assistant, Bujumbura
Laura Pavlovic	Program Manager for Burundi, USAID/EA, Nairobi
Jaidev "Jay" Singh	Senior Regional Conflict, Democracy and Governance Advisor, USAID/EA, Nairobi

Government of Burundi

Astère Bararwandika	Director, *Département des Forets, Ministère de l'Aménagement du Territoire, du Tourisme et de l'Environnement*
Faustin Harumukiza	Adviser, *Ministère de L' Environnement*
Odette Kayitesi	Minister, *Ministère de l'Aménagement du Territoire, du Tourisme et de l'Environnement*
Sylvestre Kakizimana	Director, *Department Génie Rural*
Libere Libakare	*Ministère de l'Aménagement du Territoire, du Tourisme et de l'Environnement*
Damien Macumi	Director General, *l'Aménagement du Territoire et de la Protection du Patrimoine Foncier*
Albéric Ndayisaba	Adviser, *Direction Générale des Forets, Tourisme et Environnement*
Eugénie Nduwayo	*Programme National de Lutte Anti-Erosive*
Alexis Niyonzima	Director, *l'Aménagement du Territoire*
Charles Ntunguka	Director General, *Ministère de l'Agriculture*
Benoit Nzigidahera	Ecologist, *Institut Nationale pour l'Environnement et la Conservation de la Nature* (INECN)

NGOs

Diawary Bouare	Program Director, CARE
Geoffroy Citegetse	National Coordinator, *Association Burundaise pour la Protection des Oiseaux* (ABO)
Kevin Doyle	Coordinator, Kirundo Office, Catholic Relief Services

Abdalla Meftuh	Africare
Etienne Ndabakinga	National Coordinator for Security Program, World Vision
Melchior Ndayimirije	Program Manager, *Observatoire de l'Action Gouvernementale* (OAG)
Louis-Marie Nindorera	Burundi Country Director, Global Rights
Marius Rurahenye	Program Officer, Africare

Other

Antonius Broek	Country Director, United Nations Development Programme
Damas Ndumumwani	Environmental Consultant