The image features a young boy in traditional Rwandan clothing, including a beaded necklace and a headband, holding an assault rifle. The entire scene is overlaid with a semi-transparent teal color. The background consists of large, stylized reeds or grasses. The title is written in a bold, white, sans-serif font, and the author's name is in a smaller, white, sans-serif font. At the bottom, there is a dark teal horizontal bar containing the text 'Biodiversity Support Program' in white.

The Impact of of Civil War on the Conservation of Protected Areas in Rwanda

By Andy Plumptre

Biodiversity Support Program

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Abstract

The genocide that took place in Rwanda in 1994 and the insecurity in the years before and after have created many difficulties in protecting areas of conservation importance in Rwanda. Results of recent surveys show that large mammal populations have been reduced in number in Rwanda's three major protected areas: Nyungwe Forest, Akagera National Park and the Virunga Volcanoes. Gishwati and Mukura Forests have been all but lost, and the Akagera National Park has been reduced to 30 percent of its original size. Despite these losses, there have been conservation successes, which include the protection of most of the mountain gorillas in the Virunga Volcanoes and the maintenance of the Nyungwe Forest intact. The lessons that have been learned from operating in Rwanda during this time highlight the importance of maintaining a presence during periods of instability, as well as the importance of junior staff in enabling conservation efforts to take place.

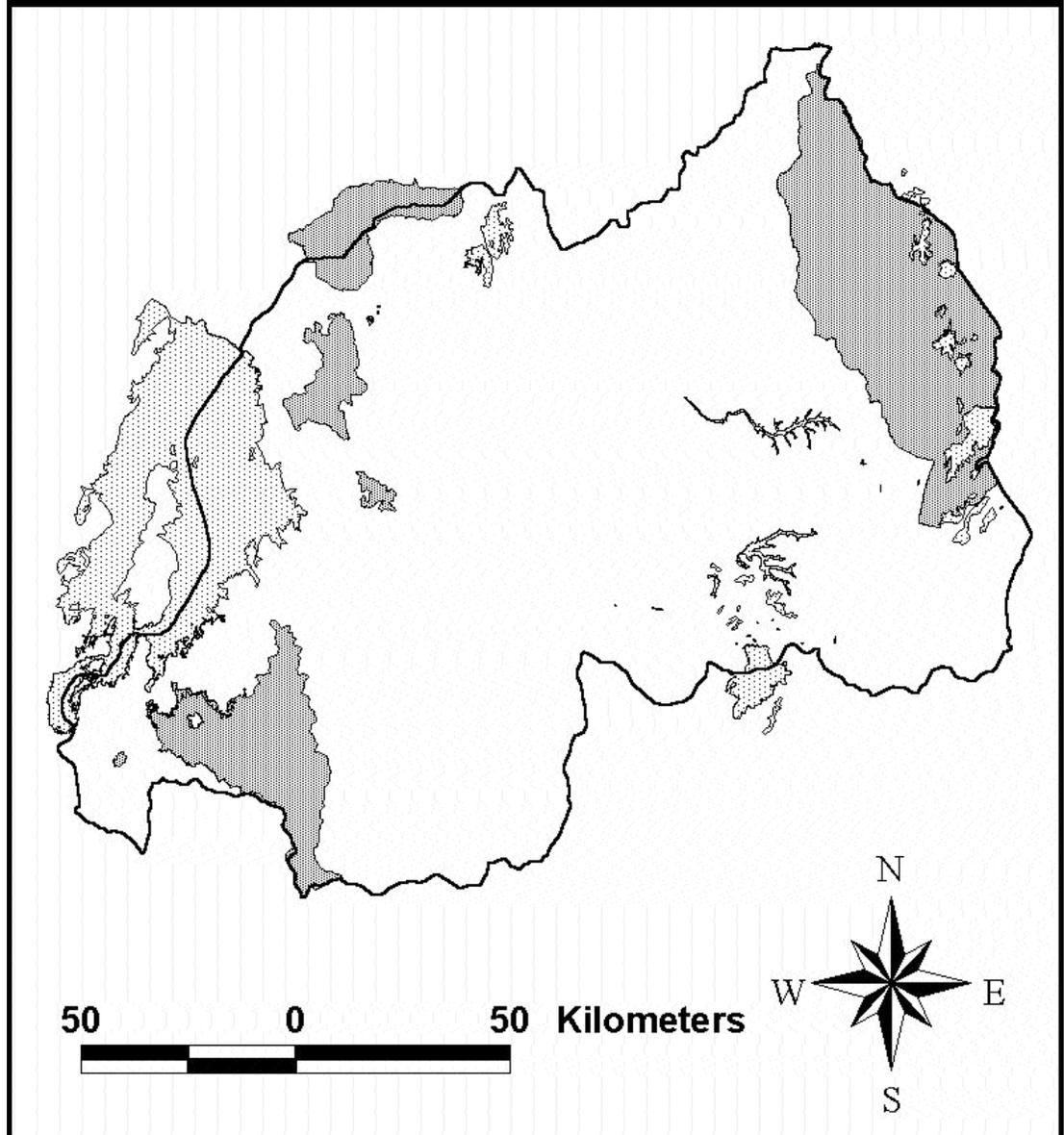
Introduction

Rwanda is one of the smallest countries in Africa, and, until the last 20 years, it was little known by the outside world. Its high soil fertility, due to rich volcanic soils, has led to the highest population density on the African continent, with up to 500–700 people per square kilometer (Weber, 1987a, 1989; Olson et al., 1995). Over 90 percent of the population relies on subsistence agriculture to meet its needs, with a concomitant need for land, which puts great pressure on the country's remaining natural ecosystems, whether forested, savanna, or wetland.

Despite this pressure, two national parks and several forest reserves had been established by the mid-1950s for either complete protection or sustainable management (Weber, 1987b, 1989). A large portion of these areas was gradually converted to agricultural land over time (Weber, 1989), but even in 1990 more than 10 percent of the country was still under some form of protection (Figure 1). During the mid-1970s, gorilla research and gorilla tourism started to bring Rwanda into the international spotlight, and, by the end of the 1980s, gorilla tourism was a major source of foreign currency for the government, second only to coffee and tea exports (Weber, 1987b, 1989, 1993; Vedder and Weber, 1990).

During this time, Rwanda was a major recipient of foreign aid and was considered to be one of the model countries for the development community (Uvin, 1998). Considerable amounts of money (millions of U.S. dollars) were invested in agriculture and development projects, and natural resource management also became a major beneficiary of this aid. Despite this financial support, there was a growing political divide between those in power, primarily between factions representing the northwest of the country and the rest of the country. The northwest of the country is a region controlled by the Hutu ethnic group, and this region had never been strongly under the control of the Tutsi rulers (the other main ethnic group in Rwanda) prior to Belgian colonization. In 1990, the president and most of his closest advisors came from this region. During the late 1980s and early 1990s, the external aid to Rwanda began to dwindle with the demand by the donors for economic reforms and a transition to greater democracy. This reduction in aid probably helped to increase the instability in the country. In October 1990, a civil war began that eventually led to genocide in 1994. A low level of unsafe conditions has continued to the present day. This case study analyzes the impact of the war and subsequent instability on conservation in Rwanda, and highlights some of the lessons that have been learned while trying to maintain conservation operations during this period.

Figure 1. Map of Rwanda showing the location of protected areas. Situation in 1990.



Map: Andy Plumtre; Michel Masozera.
Source: Authors; Stuart Williams.

Brief history of the Rwandan civil war and genocide

In 1990, the Rwanda Patriotic Front (RPF) attacked Rwanda from Uganda and established a base in the Virunga Volcanoes. For some time, they had tried to negotiate a peaceful return to Rwanda, but the government had refused this request, because they claimed there was no land available to settle people. Most of the leaders of the RPF

had helped the president of Uganda to come to power during the civil war from 1981 to 1996, and, consequently, were battle-hardened and eager for power in their own country.

The Virunga Volcanoes are a mountain chain which straddles the borders of Uganda, Rwanda, and the Democratic Republic of the Congo (DRC), and consists of three national parks, one in each country. The RPF was largely composed of the descendants of Tutsis who had fled Rwanda in the late 1950s and early 1960s to avoid inter-ethnic conflict between Tutsis and Hutus in Rwanda. Following their invasion of Rwanda, the RPF maintained a presence in the Virunga Volcanoes for the whole period from 1990 to 1994.

During this time, there were several international attempts to promote peace, and, in August 1993, a peace accord was duly signed. However, extremist political forces closely linked with the government in Rwanda were not satisfied with the peace plan, particularly the power which the RPF would be given in the national armed forces. In April 1994, when the president of Rwanda was returning from Arusha in Tanzania, where he had finalized talks about power sharing with the RPF, his plane was shot down by a missile, killing both him and the Hutu president of Burundi. Immediately, political killings began in Kigali (the capital), which had obviously been planned prior to the plane crash, and which led to the genocide of an estimated 800,000 Tutsis and moderate Hutus. These killings were undertaken by militias called the *interahamwe* ("those who work together"). Following the plane crash, the RPF launched a major offensive, attempting to halt the massacres, and, by early July, it had taken Kigali. In late June, the French government launched an operation (Operation Turquoise) to occupy southwest Rwanda and prevent killings taking place there by either side. Some argue that this was a move to protect the leaders of the Rwandan Government, whom France had been supporting against the RPF (Berry and Berry, 1999; Prunier, 1995).

By July 1994, the RPF had taken the rest of the country and declared an end to the war. However, between 1.7 and 2.0 million Hutus fled Rwanda during July and August in fear of reprisals, and massive refugee camps were established in eastern Congo (DRC) and western Tanzania to accommodate them. These became sites from which the *interahamwe* and ex-government forces could rearm, train, and launch guerilla attacks on civilians and military targets within Rwanda. Relative calm returned to Rwanda during 1995 and most of 1996, but sporadic guerilla attacks started to take place, with the guerillas often using the forests in protected areas as bases. In October 1996, forces loyal to the new Rwandan government launched an offensive to remove the *interahamwe* from refugee camps in the DRC and to repatriate refugees who were willing to return to Rwanda, but scared to do so because of threats to their safety by the *interahamwe*. This offensive was very successful in closing the camps and repatriating refugees. It also led to the war in the Democratic

Republic of Congo that ended in the toppling of the President of that country, Mobutu Sese Seko, in 1997.

Following the return of thousands of refugees, sporadic attacks within Rwanda escalated, particularly in the northwest of the country, which had been a political stronghold of the previous government. During 1997 and 1998, killings were widespread in the prefectures of Ruhengeri and Gisenyi, both by the *interahamwe* and by the RPF in retaliatory strikes (African Rights, 1998). This instability continued until early 1999, after which peace was largely restored to the whole of the country, although occasional sporadic attacks continue up to the present time.

Impacts of the war on Rwanda's biodiversity

In 1990, the national parks—Parc National des Volcans in the Virunga Volcanoes, Akagera National Park in the east, and part of Nyungwe Forest Reserve—fell under the management of the Office Rwandais pour le Tourisme et les Parcs Nationaux (ORTPN), Rwanda's Department of Tourism and National Parks in the Ministry of Environment and Tourism. The remaining protected areas (Gishwati Forest and parts of Nyungwe Forest) were managed by the Direction Generale des Forêts (DGF) in the Ministry of Agriculture and Forest Management. Despite common management, the impacts of the war on each of the parks and major forest reserves in Rwanda have varied. In order to assess impacts, we have examined changes in the numbers of large mammals where data exist, since, during war, large mammal populations are often decimated because they provide a source of protein for armies and refugees.

Virunga Volcanoes

The Virunga Volcanoes region encompasses about 425 square kilometers of forest and open parkland straddling the borders of Rwanda, Uganda, and DRC, at an altitude of 2600–4500 meters. In Rwanda, the Parc National des Volcans (PNV) covers approximately 150 square kilometers. This region is best known for its mountain gorillas (*Gorilla gorilla beringei*) and the Karisoke Research Centre (KRC), established by Dian Fossey, where researchers have studied these animals for over 30 years. In the early 1980s, following research and pilot work supported by the Wildlife Conservation Society (WCS), the Mountain Gorilla Project was established with support from the African Wildlife Foundation (AWF), Fauna and Flora International (FFI) and the World Wildlife Fund (WWF) (Weber, 1981; Vedder and Weber, 1990). This project designed and implemented a tourism program, which came to be viewed as a model conservation project and brought in millions of dollars for Rwanda and ORTPN. This money also indirectly helped support conservation efforts in other protected areas in Rwanda. The International Gorilla Conservation Programme (IGCP)

grew out of the Mountain Gorilla Project. Immediately prior to the war, ORTPN was partly supported by IGCP, and KRC was supported by the Dian Fossey Gorilla Fund (DFGF).

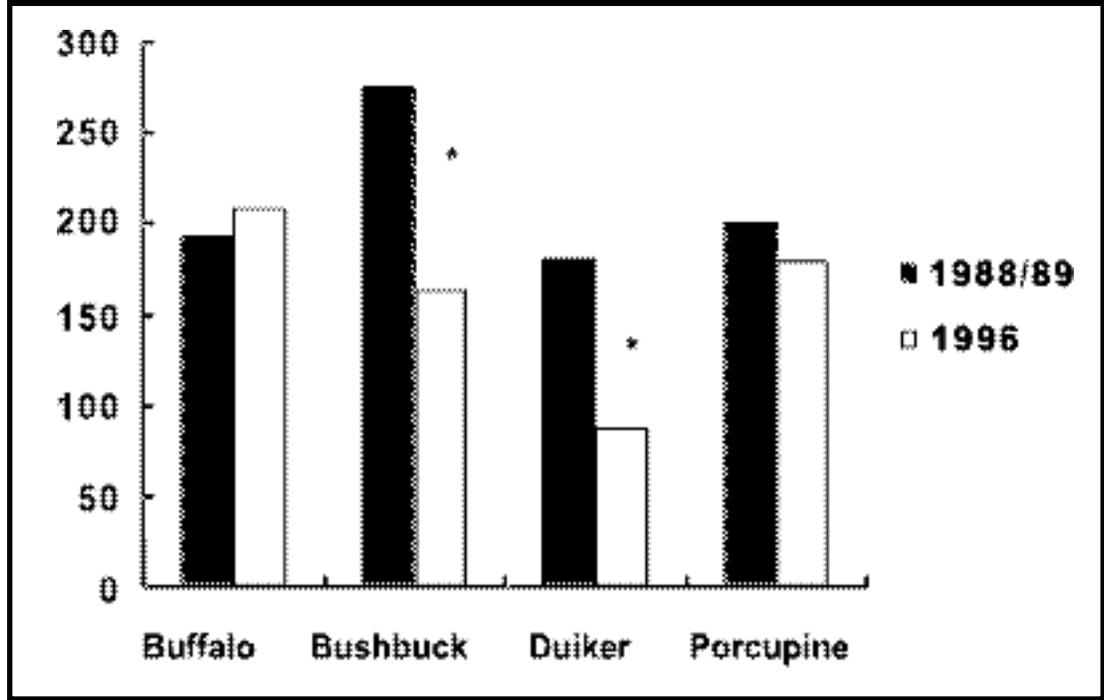
Following the invasion by the RPF in 1990, it was unsafe to enter the forest in the eastern Virunga Volcanoes between the volcanoes Sabinyo and Muhabura. Anti-personnel mines had been laid by both sides, both in the park and along its edge. However, the park staff did continue to patrol the forest in the western section of the park. In 1991, the Rwandan army cut a swathe of vegetation about ten meters wide through the forest to allow them to patrol and prevent any RPF soldiers from moving into the western half of the park. Occasionally, the Rwandan army fired mortars into the forest at the RPF.

International and national researchers working in the forest at KRC were evacuated several times between 1990 and 1994, when the security situation deteriorated. At the start of the mass killings in 1994, the director of KRC evacuated to eastern Congo (DRC) and, with the DRC representative for IGCP, helped to establish a refugee camp specifically for the park staff and KRC employees who came across the border through the forest. In Rwanda, much of the park infrastructure was destroyed, and buildings were looted (Werikhe, Mushenzi and Bizimana, 1998). Many refugees from Rwanda were settled close to the Congolese portion of the Virunga Park in DRC, leading to the clearing of a large area of forest for firewood (Lanjouw, Cummings and Miller, 1995; Henquin and Blondel, 1996; Biswas and Tortajada-Quiroz, 1996).

One month later, most of the park and KRC staff returned to Rwanda, once the RPF had taken the country and the security situation had improved, although many had lost friends or family to cholera in the camps during this one-month period. In the process of returning, they were attacked by the *interahamwe* in DRC, who did not want any refugees to return to Rwanda. By this time, all senior staff for the PNV had left Rwanda, as it was considered too insecure for them to be near the park. Consequently, the returning junior staff took on the responsibility of organizing patrols, monitoring gorilla groups, and transporting protected-area staff salaries from Kigali by taxi. In addition, IGCP provided financial support for the de-mining team that removed all the anti-personnel mines. Eventually, tourism to see the gorillas recommenced in 1995.

In 1996, a study was conducted to evaluate the impact of the war on ungulates in the PNV (Plumptre and Bizumuremyi, 1996; Plumptre, et al., 1997) which showed that ungulate numbers had not changed significantly since 1989, although there was some evidence that they had migrated to higher altitudes in the park (Figure 2). One possible explanation for this migration could have been that poaching had intensified at lower altitudes. The level of poaching in the park had increased, indicated by increasing sales and declining prices of bushmeat in markets, despite the fact that prices of

Figure 2. Changes in the relative abundance of ungulates (based on reported incidents of crop raiding) in the Parc National des Volcans from 1988/9 to 1996. * = significant change in numbers.



domestic meat were increasing. Domestic meat prices increased as a result of a loss of livestock during the war, and bushmeat was used to satisfy the demand for meat.

During 1997 and 1998, many of the park and KRC staff members were targeted by the *interahamwe* among the returning refugees, leading to several deaths. Many other refugees fled and lived in the forest during this time, leading to heavy poaching of bushmeat. By 1999, it was possible to resume research visits to the gorillas, and tourism also started once more. Amazingly, few gorillas from the habituated groups were killed during the whole period of the war, although a census of the population is required to see whether this is true for the whole population. Data on nests of gorilla groups, found by park guards while on patrol in the forest, indicate that the population has risen to at least 350 animals (J. Kalpers, E. Williamson, and A. McNeilage—in preparation), but only a comprehensive census can give us an idea of the total population. A census is planned once there is sufficient security in all sectors of the volcanoes.

Nyungwe Forest Reserve

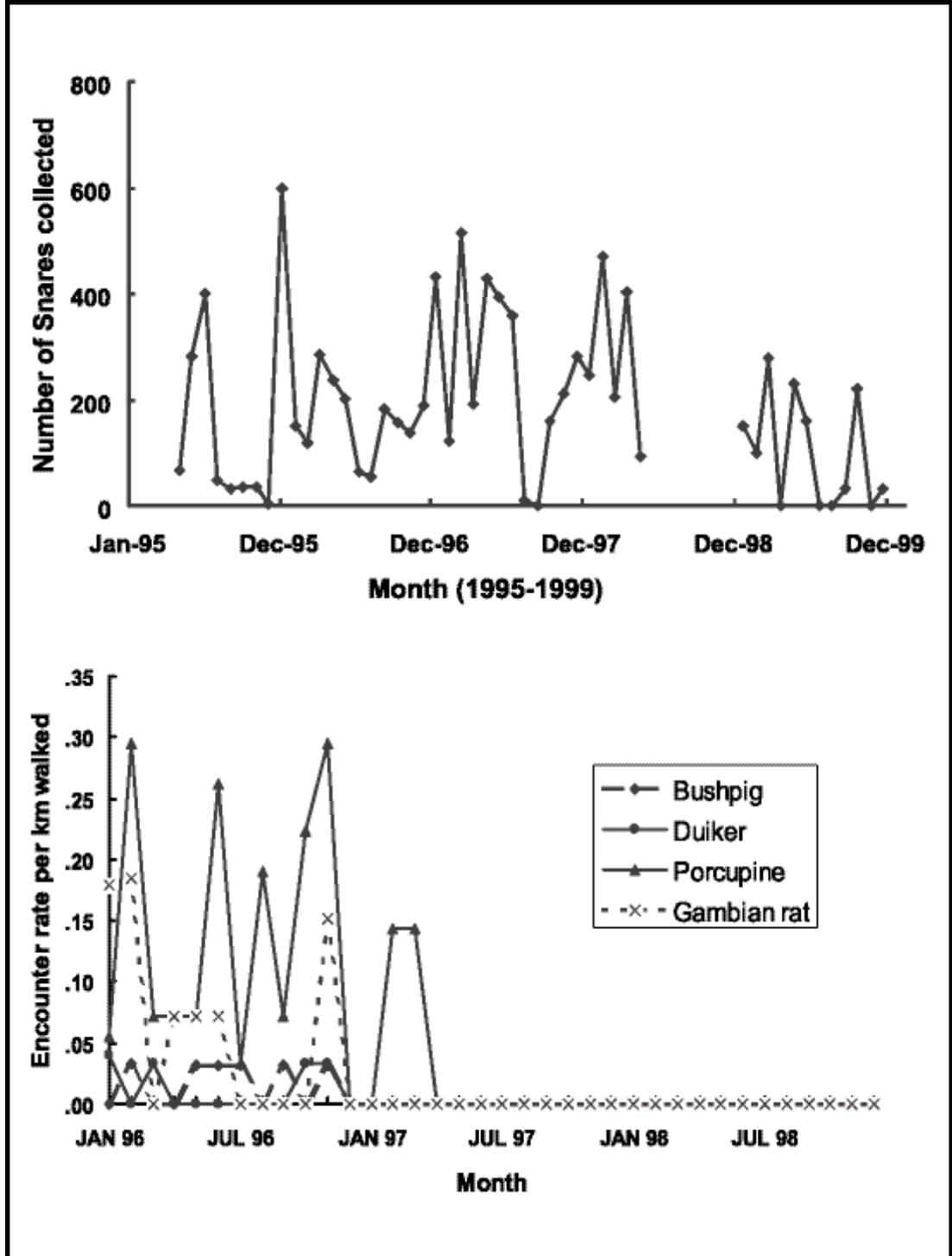
The Nyungwe Forest Reserve, in southwest Rwanda, comprises 970 square kilometers of very mountainous terrain, and protects one of the largest remaining afro-montane forests in Africa. It contains many species endemic to the Albertine Rift, particularly 25 endemic bird species and two regional endemic primates. Prior to the war,

the forest had been divided into four management zones, as part of an action plan for the conservation of forests along the Zaire-Nile divide (DGF, 1984). Each zone was financially supported by a different agency: the French Caisse Centrale, Swiss Government, European Development Fund, and the World Bank. Forty percent of the forest was officially designated as a nature reserve, and this was managed by ORTPN; 10 percent around the fringe was open for forest exploitation; and 50 percent was to be inventoried to allow appropriate forms of utilization to be assessed (Weber, 1989). The Projet Conservation de la Forêt de Nyungwe (PCFN), the Nyungwe forest conservation project, supported by the Wildlife Conservation Society (WCS), was established in 1987 to help ORTPN start a tourism, research, and monitoring program in the nature reserve.

This forest was less affected by the war in Rwanda, because, for most of 1990-94, there was no instability in this region. During the most intense period of the war in 1994, this forest was held by the French during the Operation Turquoise, so that there was little fighting here. During 1994, the expatriate directors of PCFN and senior Rwandan staff left Rwanda, leaving the junior staff to manage the project. The internationally funded projects in each of the four management zones were terminated and were never resumed after the genocide. The chief warden employed by ORTPN remained, but was later murdered. For five months the junior staff carried on working despite receiving no salary (Fimbel and Fimbel, 1997). As security improved, it was possible to appoint a new Warden, and the directors of PCFN returned for a short visit, appointing a Rwandan replacement. In 1995 and 1996, the Rwandan Patriotic Army (RPA—formed from the RPF) prevented the local population from entering the forest, as there were suspected pockets of resistance hiding therein, particularly near the Burundi border. PCFN and ORTPN were able to continue operating, with security provided by the RPA.

By 1998, calm had been restored to this region, and the RPA presence was very much reduced. With this calm, however, came increased pressures on natural resources from local communities. It was the case in Rwanda that the threats to protected areas were less during the conflict than immediately after the conflict, when the government was being rebuilt and there was little law enforcement capability on the ground. At this time, ORTPN was strapped for financial support, and so PCFN assisted in patrolling the forest. At this time, poaching levels were very high in the forest. Large numbers of snares were collected regularly following the war and the subsequent departure of the army, and the number of ungulates, porcupines (*Atherurus africanus*) and Gambian rats (*Cricetomys gambianus*) drastically declined along transects monitored in the forest by PCFN (Figure 3). This was as a direct result of the large number of snares present, as evidenced by an average of 300–400 collected by patrols per month. It is also believed that the last elephant in Nyungwe was killed in 1999 by poachers looking for ivory. This leaves no large mammals in the forest to control the extent of understory herbaceous vegetation. How the absence of large mammals may impact the forest and its regeneration is as yet unknown.

Figure 3. Measures of poaching levels in Nyungwe following the genocide in 1994: (a) numbers of snares collected around Uwinka and Gisakura by PCFN staff; (b) the encounter rate of signs of bushpigs, duikers, porcupines, and Gambian rats along transects monitored by PCFN staff around Uwinka



Akagera National Park

Akagera National Park in the east of Rwanda once contained 2,500 square kilometers of savanna woodland, grassland, and wetlands within the park and the adjacent Mukura Hunting Reserve. This park was extremely rich in large mammals, and particularly important for the conservation of Sitatunga (*Tragelaphus spekei*) and Roan (*Hippotragus equinus*) antelope. In addition, Akagera was home to an extraordinary variety of birds, due to its habitat diversity, its key location in migration flyways, and its extensive wetlands. During the initial invasion in early 1990, this park was invaded by the RPF, but they were driven back to Uganda by the army with support from the Congolese (then-Zairean) army. Many animals were killed in this park between 1990 and 1993 (Fourniret, 1994; Kanyamibwa, 1998; Williams and Ntayombya, 1999) as a result of the presence of military personnel in this park, who actively hunted animals to feed themselves.

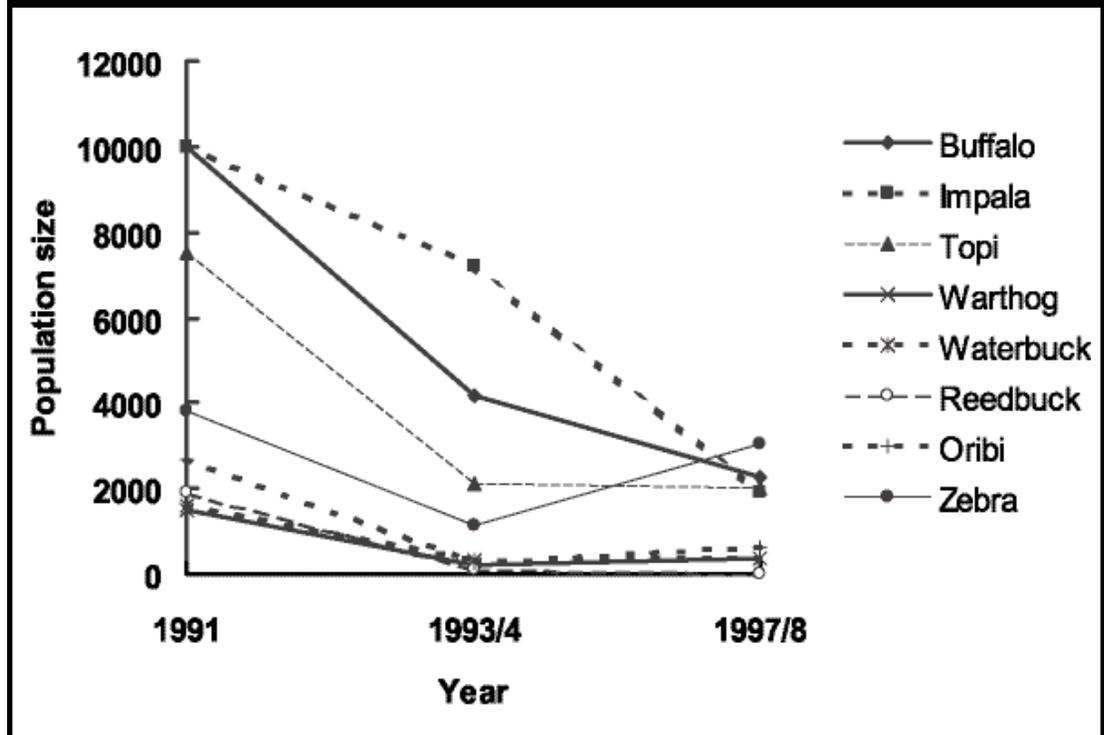
Prior to the war, the World Wide Fund for Nature (WWF) had supported ORTPN in managing this park. WWF removed its staff in 1990, and ORTPN struggled to continue supporting the park. Following the genocide in 1994 and the change of government, official policy allowed many of the returning Tutsis to occupy a major sector of the park, as most of them came back with cattle that required grazing land, and this was the only land where anyone could be settled easily. There was an international outcry against this, and, eventually, in November 1998, the park was officially re-designated as an area of 732 square kilometers, or about 30 percent of the park's original extent (Williams and Ntayombya, 1999). It is estimated that this reduction in size will lead to a loss of 15 percent of tree and shrub species, 20 percent of herbaceous species, and about 13 percent of bird species from the park (Nyilimanzi, et al., 1997). The German technical cooperation agency (GTZ) is now supporting ORTPN in the management of Akagera.

Estimates of large mammal densities from 1991 and 1997/98 show large reductions in numbers (Figure 4) to about 30 percent of the original population size (Williams & Ntayombya, 1999). This is both a result of heavy hunting during the war, and also the loss of critical habitat to cattle following the war.

Gishwati and Mukura Forest Reserves

Gishwati and Mukura Forest reserves had been heavily affected by human activities prior to the Rwandan civil war. Gishwati constituted approximately 280 square kilometers in the mid-1970s and contained populations of chimpanzees (*Pan troglodytes*) and golden monkeys (*Cercopithecus mitis kandti*), although the forest was fairly degraded by many years of cattle herding within the forest (Weber, 1989). The World Bank supported an integrated forestry and livestock project that converted 100

Figure 4. Changes in large mammal populations between 1991 and 1997/98. Data are from Williams and Ntayomba 1999. Impala populations are plotted as one third their actual size to allow them to fit on the figure.



square kilometers to pasture and another 100 square kilometers to pine plantations in the early 1980s. A 30 square kilometers area was designated as a military zone in the north of the forest, leaving only 50 square kilometers of natural forest. This forest was never the focus of serious conservation efforts, although it was surveyed for its mammal biodiversity by the World Bank in 1985 (Vedder, 1985), and forest conservation was one of the Bank's project objectives. During and following the war, the northern part of Gishwati was used for camps for displaced persons, which grew rapidly. People both settled and farmed within the reserve. During 1997 and 1998, the forest was also used as a hideout by many of the *interahamwe*, and numerous military operations took place in the forest in an attempt to remove them. As a result of a heightened military presence in the region, local people often fled their homes and shifted to more stable areas, thus creating further pressures on land and forest degradation.

Mukura Forest comprised only about 20 square kilometers in the late 1970s and was never seriously surveyed for its biodiversity value. The Zaire-Nile Divide management plan (DGE, 1984) aimed to protect this reserve and plant a buffer zone of pines

around it, and the World Bank supported some of this replanting work. However, the forest was never a focus of any direct conservation efforts.

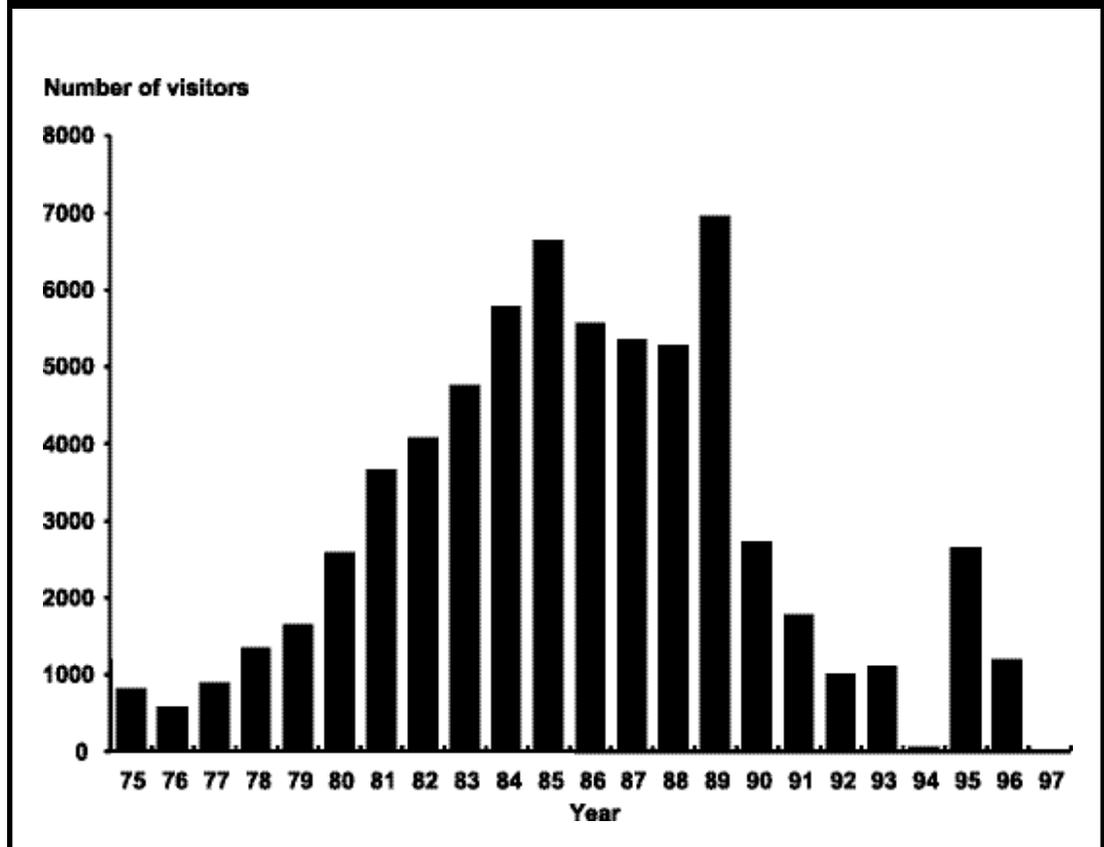
In early 2000, WCS/PCFN organized a survey of both forests to assess the current status of the natural forest and to determine whether it would be useful to encourage conservation efforts. This survey followed a request by the Department of the Environment, which was under pressure to shift refugees from Gishwati and settle them elsewhere (the Parc National des Volcans was one proposed site). Findings of the survey were bleak. There was little of the original forest remaining in Gishwati: only a few stands of trees of less than one hectare in size. Mukura had also been severely degraded, with only approximately 8 square kilometers remaining. However, even this small remnant contained several Albertine Rift endemic birds of conservation importance. It is unlikely that these populations will be viable in the long term with such a small area of habitat. Nyungwe and the Parc National des Volcans are now the only sites where these species are likely to survive for any length of time.

Economic consequences of the war in Rwanda

The war in Rwanda had significant consequences for the economy of the country, which, in turn, affected the support of conservation projects in its parks and forest reserves. Tourism was a major source of revenue for the government and for ORTPN, bringing in around \$1 million U.S. as gate fees and an estimated \$3–5 million U.S. as revenue spent in the country on food, transportation, and accommodation (Weber, 1993; Butynski and Kalina, 1998). Following the invasion by the RPF in October 1990, tourist numbers dropped drastically (Figure 5) and have yet to recover. There was, therefore, a concomitant decrease in revenue for ORTPN to support the salaries of its staff.

The war also led to the closure of many of the major foreign assistance projects in the country. As the security situation in Rwanda deteriorated between 1990 and 1994, all major bilateral and multilateral donors withdrew from funding projects. The United States Agency for International Development (USAID) ceased its funding of projects in Nyungwe Forest and the Parc National des Volcans in 1990, amounting to a withdrawal of approximately \$1.5 million of anticipated support between 1990 and 1994. Among other donor contributions to Nyungwe prior to the war, the French government was putting in about \$1.25 million per year, the Swiss government \$350,000, the World Bank nearly \$3 million, the Belgian government \$100,000, and WCS/PCFN \$125,000 (Olson, et al., 1995). With the exception of WCS/PCFN funding, all this support was halted permanently, and today there is little to show for the large investments made by these projects. Project reports are not even available in missions in Rwanda.

Figure 5. The number of tourists coming to visit gorillas in Rwanda between 1976 and 1997. The increase in 1995 was primarily due to aid workers visiting the gorillas from the many projects that were established in Rwanda, but unsafe conditions increased in late 1996, and tourism was closed in 1997. We do not have recent data, but we know that tourism re-opened in 1999, and numbers have been coming back to about 30 percent capacity during peak tourist seasons.



The halting of foreign assistance was partly a result of poor security for project personnel, but it was likely due as well to the politics of avoiding support to a corrupt regime. Governments providing aid to countries have a duty to protect the lives of their staff and also a duty to their constituencies to try to ensure that they are not aiding corruption or civil strife. However, by pulling out on short notice, the impacts of many good projects can be lost, and the staff they were supporting has few alternatives for survival. Government aid agencies should think about contingency mechanisms for getting funds to projects during times of civil strife, in order to bypass the problems that they would face by giving the support to government directly. One possible mechanism is to use NGOs that are willing to continue working in-country.

Following the genocide, development agencies returned to Rwanda, but drastically revised their priorities in the light of post-war needs. For at least two to three years, almost all assistance was focused on humanitarian relief, with little funding going to development programs. Only the Dutch government contributed support to conservation (PCFN in Nyungwe). Even this support lasted only eighteen months, after which priorities for aid changed, due to a change in government in The Hague. The German government indicated a willingness to support conservation, but waited until the park boundaries of the Akagera National Park were finally officially re-designated before it committed funds. As this report is being written, the German Government is the only bilateral donor funding conservation in Rwanda, six years after the genocide, despite the fact that conservation of forests for watershed protection and maintenance of clean water supplies is a crucial aspect of agricultural production, disease reduction, and land stabilization. Rwanda has not been able to grow food sufficient to feed its population since the 1994 genocide.

Lessons learned

Several lessons can be drawn from the experiences of conservation programs in Rwanda, providing the basis for useful recommendations for project management and for minimizing the negative impacts of conflicts on protected areas that may find themselves in situations of civil war and instability in the future.

Maintaining a presence

The two protected areas in Rwanda that survived relatively intact were those where a presence was maintained virtually throughout the conflict. In the PNV and Nyungwe, ORTPN and project staff remained on site or were absent for a period of one month at most. Despite the fact that during much of 1994 the only presence was that of junior staff, personnel at both sites were dedicated to the conservation of their protected area, and this dedication clearly contributed to its survival (Hart and Hart, 1997; Fimbel and Fimbel, 1997; Plumptre, 2000). Senior staff in almost all situations were targeted and forced to flee. This is not surprising, since in many cases in Africa senior staff may:

- Come from an ethnic/religious group in power, and are, therefore, targeted by those from a rival group that is attempting to come into power;
- Come from a group that is challenging the authorities/government in power and, therefore, are targeted by those currently in power; or
- Have access to project funds or vehicles (or are thought to have such access) and so are targeted by thieves.

To maintain a presence during a period of civil war, two factors are necessary: committed people and funding. As shown in the previous section, major funding can be cut very rapidly, if it comes from bilateral/multilateral aid agencies. The politics of governments providing aid to governments at war is always tricky, but the politics of war does not hinder international NGOs operating within a country to the same extent. If bilateral/multilateral agencies would instead agree to continue supporting projects through international NGOs during periods of instability, the protected areas in which they may have been investing millions of dollars would be much more likely to survive. The UN Foundation supported by Ted Turner has taken a lead in this recently by approving a \$3 million fund to five World Heritage Sites in eastern DRC. These parks or reserves are currently cut off from all financial support from the DRC national park authorities (ICCN) headquartered in Kinshasa in the west, because civil war has divided the country. Other major donors should be encouraged to explore similar opportunities for supporting conservation activities in areas of conflict.

Developing committed staff

Building a committed and protected area staff has probably more to do with personnel management than anything else. One of us (A. Plumptre) undertook a survey of staff members from two projects in Rwanda (PCFN and KRC) to determine what factors led to staff maintaining a presence and a desire to continue protecting their forests. When interviewed, the junior staff gave a variety of reasons for continuing work in the forest despite risks to their lives (Plumptre, 2000). One of the main reasons cited was the belief that they would continue to receive their salaries at a regular interval, and, if it was not possible to get funds to them, they would receive back pay once security resumed. For many, it was not the amount of pay, but the fact that senior staff endeavored to get payments to them at fairly regular intervals that was most important. However, pay was not the only factor considered to be important. Many staff members believed that their work was important to their country, based on the fact that they had been taught about the uniqueness of the forest in which they worked. Many also continued working because they believed that senior staff cared for them and would come back when the situation was more secure (Plumptre, 2000). In some cases, senior staff demonstrated their concern by raising support for safe houses for others and their families, by providing funds for rebuilding homes, and also by providing funds to look after the widows and families of those who had died as a result of the war.

There are, of course, risks to maintaining a presence. Thirteen of the KRC staff, about ten PNV staff, and about 90 park guards in the Virunga National Park in DRC lost their lives between 1994 and 2000. Any loss of life should be unacceptable to a project, and the risk of loss of life should be one of the criteria to decide whether to pull out of a region. However, many of these staff lost their lives while at their

homes, rather than while on duty. When interviewed, many staff members wanted to continue working when their perception of the risk was low, despite their acknowledgement that their colleagues were being killed. Many felt that it was better to continue working than to be left to live in a war-zone with no access to financial support. If staff members feel that it is too dangerous to operate, then project leaders should not push them to operate (there can be pressure to do so when a project has to show that it is carrying out its mission in order to raise financial support). Many senior staff members may also want to continue to work in an area because they care for their employees and the place they work, and, consequently, they may not want to leave even at times when it is advisable that they do so. Therefore, in such situations, there must be some level of oversight and management of the senior staff from the organization's Head Office.

Maintaining a presence has benefited the international NGOs that work in the Virunga Volcanoes and Nyungwe in a number of ways. First, because they maintained a presence throughout periods of instability, these NGOs have become highly respected by the new government for their commitment to the country at a time when many major donors fled. Secondly, this has allowed these NGOs to exert substantial influence on conservation activities in the country. For instance, since 1994, there have been several major threats to the PNV that have been averted because of the presence of these NGOs and committed ORTPN staff in the field. These threats include de-gazetting a portion of the park for cattle grazing, resettling refugees from Gishwati in the park, and (most recently) constructing a road across the park to Djomba in DRC.

Planning ahead

With hindsight, it is facile to say that conservation agencies and NGOs should have been better prepared for the Rwandan war. During most of 1990–94, full-scale war and the overthrow of the government were not anticipated. There were occasional guerilla attacks, but negotiations were maintained and peaceful solutions continued to appear possible. It is remarkable that mid-term evaluations of USAID and World Bank conservation projects at this time barely mention unsafe conditions in the country (Goussard, 1992; Brusberg, et al., 1993; Frumhoff and Bergmark, 1993). Plans continued to be made and projects continued to be implemented as if unstable national politics and rising tensions were not significant factors that could potentially reduce the effectiveness or viability of their projects.

Conservation projects can indeed plan for unsafe conditions, however, and should do so if there is any hint of potential problems. First, they should plan for different levels of preparedness and assure that all project staff members are aware of these in case of emergency. Plans should exist for different levels of risk to personnel and should be

updated regularly as new information is obtained about the current situation. One aspect of project operations should be acquisition of information from several sources on what is known about the dangerous conditions and armed forces in the region where the project is operating. For example, evacuation plans should be well established, transfer of responsibilities programmed in advance, and reduced or irregular-flow budgets defined. Sorting out these types of issues prior to the actual situation is far better than trying to communicate with remaining staff from afar while a crisis is occurring.

Training junior staff

Junior staff can also be trained to take on more responsibilities prior to any war by establishing a management system in which designated employees manage smaller teams and their funding. Providing further training for these employees is also important, whether through on-the-job training or external courses. Much of the training that conservation projects provide is normally aimed at senior staff, leaving junior staff neglected. Training and designation of responsibilities for both levels are needed, especially during crises. If senior staff members are forced to flee, alternative training or job experience can better prepare them for responsibilities upon their return. For example, the time required for a political situation to stabilize can allow senior staff to take advantage of several years at a university and then resume their work with new qualifications that are of greater value to conservation in the country.

Maintenance of neutrality

It is crucial that all projects maintain good communications with staff, government representatives, and the military in power, and, at the same time, maintain a neutral political position. Maintaining neutrality is not easy, and it may not be possible to achieve in some cases. For instance, the mere fact that ORTPN and KRC staff operated in the Virunga Volcanoes meant that they were targeted by the *interahamwe* for siding with the new authorities in power. However, there are clear lines between continuing to do the work that your project is supposed to do and giving help to the military to operate in the region. Many relief agencies refuse to transport soldiers and people carrying guns as a policy to demonstrate that they are remaining neutral. However, in many cases, in order to operate, project personnel must conduct joint patrols with the military, and this can give an impression of lack of neutrality. During a survey that WCS carried out in Kahuzi Biega National Park in 2000, an effort was made to educate the local communities around the park about the importance of the work that was taking place and the necessity for the military patrols to be there in an attempt to reduce the conflict that might have arisen.

Good communications with local communities and those in power

Programs that help inform the military, government officials, and local communities about conservation program objectives and their importance for the future of the country can also help to build important constituencies for both good and bad times. Where possible, talking with the military, particularly senior commanders, about the importance of a protected area can lead to lower poaching levels and impacts on the environment. Often, it is the presence of the army that leads to high levels of poaching during times of civil strife, such as the poaching that took place in Akagera National Park and is currently taking place in the Virunga National Park in DRC. Similarly, continued communication with local communities can help a project in several ways:

- It helps reduce conflicts over natural resource use during the armed conflict,
- It allows feedback from them about their perceptions of the current security situation and may help with warnings of pending attacks, and
- It may help identify areas of needed support for the community that, if given, may lead to better relations after the conflict.

Education of communities may play an important role in reducing the impact on a protected area during a conflict, although this is very hard to measure. Certainly, the education program during the 1980s around the PNV led to a great awareness of the international importance and rarity of mountain gorillas, and it is significant that few gorillas have been killed in the Virunga Volcanoes during the conflict, despite people starving to death in the forest. Whether this is a result of education alone is very difficult to determine, but we feel that education certainly has played a part in the good survival of the gorilla population.

Providing good communications

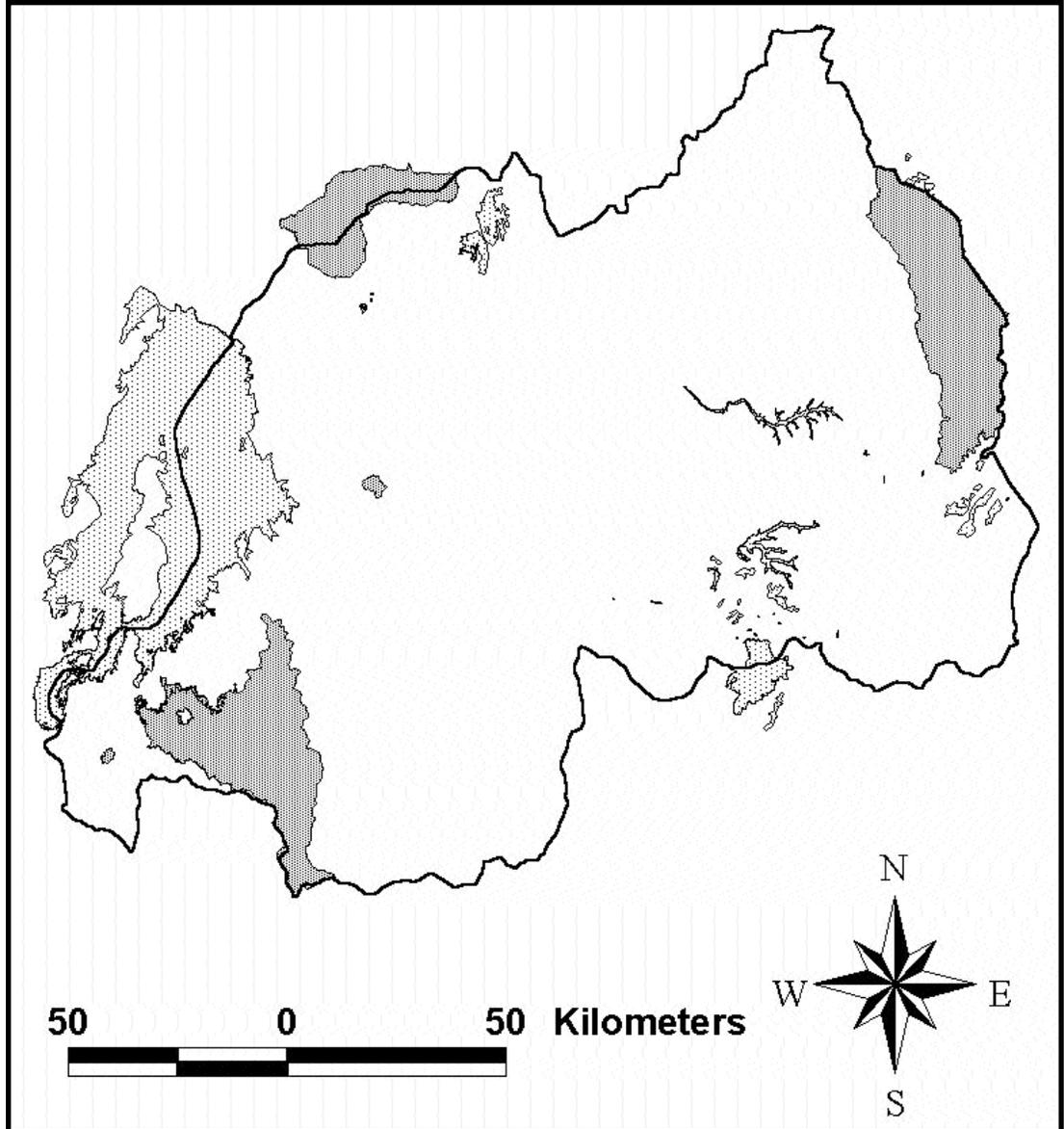
Finally, providing radio communication to staff in the field is very important to allow regular contact under difficult circumstances. The ability of senior staff to communicate with the field if they are confined to secure towns or the ability of field staff to communicate with each other when in the protected area is essential. Radio systems cost quite a bit of money and are often desired by armed groups who want mechanisms of communication themselves. However, given that it can help reduce the risk to staff lives, all projects should raise the funds for radios and replace them when stolen. Since 1994, radio systems with booster stations have been provided to the PNV and Nyungwe forest operations to ensure better communications for staff on the ground.

Conclusions

The genocide in Rwanda led to the loss of Gishwati forest, much of Mukura forest, and 70 percent of the Akagera National Park (see Figure 6 on the following page). Areas that survived largely intact were those where international NGOs and ORTPN maintained a presence with personnel and provided some financial resources. This not only highlights the importance of maintaining a presence where possible, but also highlights the importance of choosing the most important areas for conservation in the first place since these require a long-term commitment. The catastrophic period of war in Rwanda passed quickly, thus allowing conservation projects to re-establish themselves and rebuild relatively soon after the fighting started. In countries such as Sudan, Angola, Sierra Leone, Liberia and DRC, where the fighting is more prolonged, it can be far more difficult to maintain conservation operations. However, the experience of conservation efforts in Rwanda demonstrates that a committed team of nationals can maintain a presence and influence activities for conservation even during periods of armed conflict and political instability.

No armed-conflict situation will be the same, and it is not possible to provide a recipe of what to do and what not to do. However, the actions suggested here can help to minimize the negative impacts of armed conflict.

Figure 6. Map of Rwanda showing the location of protected areas. Situation in 2000.



Map: Andy Plumptre; Michel Masozera.
Source: Authors; Stuart Williams.

References

- African Rights. 1998. *Rwanda: The Insurgency in The Northwest*. London, UK: African Rights.
- Berry, J.A., and C.P. Berry. 1999. *Genocide in Rwanda: A Collective Memory*. Washington, D.C.: Howard University Press.
- Biswas, A.K., and H.C. Tortajada-Quiroz. 1996. Environmental impacts of the Rwandan refugees on Zaire. *Ambio* 25:403–408.
- Brusberg, F., J. LeBloas, P. Vergne, P. Wolf, N.N. Namde, C. Sholley, and R. MacAllister. 1993. *Mid-term evaluation of the USAID Natural Resources Management Project for Rwanda*. Washington, D.C.: USAID.
- Butynski, T.M., and K. Kalina. 1998. Gorilla tourism: A critical look. In E.J. Milner-Gulland and R. Mace, eds., *Conservation of Biological Resources*, 280–300. Oxford: Blackwell Science.
- Direction Generale des Forets (DGF). 1984. *Plan d'Action pour la Conservation et l'Amenagement des Forets Naturelles de la Crete Zaire-Nil*. Ministere de l'Agriculture de l'Elevage et des Forets, Rwanda.
- Fimbel, C., and R. Fimbel. 1997. Conservation and civil strife: Two perspectives from Central Africa. Rwanda: The role of local participation. *Conservation Biology* 11:309–310.
- Fourniret, Y. 1994. *Recensement de la faune du Parc National de l'Akageraet du domaine de chasse du Mutura (Rwanda). Période de janvier 1993 à mars 1994*: CCE-ORTPN-CIFCD Report.
- Frumhoff, P.C., and C.L. Bergmark. 1993. *Conserving Rwanda's Biological Diversity: An Assessment of Priorities and Recommendations for USAID Assistance*. Washington, D.C.: USAID.
- Goussard, J-J. 1992. *Evaluation conjointe du plan d'action pour la conservation et l'amenagement des forêts de la crête Zaire-Nil*. Rapport Sectoriel Environnement-Ecologie (World Bank).

- Hart, T., and J. Hart. 1997. Conservation and civil strife: Two perspectives from Central Africa. Zaire: New models for an emerging state. *Conservation Biology* 11:308–309.
- Henquin, B., and N. Blondel. 1996. *Etude par teledetection sur l'evolution recente de la couverture boisée du Parc National des Virunga*. Unpublished report. Gembloux, Belgium: Laboratoire d'hydrologie et de teledetection.
- Kanyamibwa, S. 1998. Impact of war on conservation: Rwandan environment and wildlife in agony. *Biodiversity and Conservation* 7:1399–1406.
- Lanjou, A., G. Cummings, and J. Miller. 1995. Gorilla problems and activities in North Kivu, eastern Zaire. *African Primates* 1 44–46.
- Nyilimanzi, V., P. Rusagara, A. Nyamacumu, U. Sabel-Koschella, T. Hartmannschen, and J-P. vande Weghe. 1997. *Clarification of the resumption of support to Akagera National Park*. Mission Report to GTZ. Kigali, Rwanda.
- Olson, J.M., G. Manyara, D.J. Campbell, D.P. Lusch, and J. Hu. 1995. Exploring methods for integrating data on socioeconomic and environmental processes that influence land use change: A pilot project. Report to Biodiversity Support Program. Michigan State University, Department of Geography, East Lansing, Michigan.
- Plumptre, A.J. 2000. Lessons learned from on-the-ground conservation in Rwanda and the Democratic Republic of Congo. Presentation at the Conference on War and Tropical Forests: New Perspectives on Conservation in Areas of Armed Conflict. Yale School of Forestry and Environmental studies, March 30-April 1. New Haven.
- Plumptre, A.J., and J.B. Bizumuremyi. 1996. Ungulates and hunting in the Parc National des Volcans, Rwanda: The effects of the Rwandan civil war on ungulate populations and the socioeconomics of poaching. Unpublished report to the Wildlife Conservation Society.
- Plumptre, A.J., J.B. Bizumuremyi, F. Uwimana, and J.D. Ndaruhebeye. 1997. The effects of the Rwandan civil war on poaching of ungulates in the Parc National des Volcans. *Oryx* 31:265–273.
- Prunier, G. 1995. *The Rwanda Crisis. History of a Genocide*. London: Hurst & Co.
- Uvin, P. 1998. *Aiding Violence. The development enterprise in Rwanda*. West Hartford, Connecticut: Kumarian Press.

- Vedder, A., and A.W. Weber. 1990. The mountain gorilla project. In A. Kiss, ed., *Living with Wildlife: Wildlife Resource Management with Local Participation*. World Bank Technical Publication 130:83–90. Washington, D.C.
- Weber, A.W. 1981. Conservation of the Virunga gorillas: A socio-economic perspective on habitat and wildlife preservation in Rwanda. Masters thesis. University of Wisconsin, Madison, Wisconsin.
- . 1987a. Ruhengeri and its resources: An environmental profile of the Ruhengeri Prefecture. Kigali, Rwanda: ETMA/USAID.
- . 1987b. Socio-ecological factors in the conservation of afro-montane forest reserves. In C. Marsh and R. Mittermeier, eds., *Primate Conservation in the Tropical Rain Forest*, 205–229. New York: Alan R. Liss, Inc.
- . 1989. Conservation and development of the Zaire-Nile divide. An analysis of value conflicts and convergence in the management of Afro-montane forests in Rwanda. PhD dissertation. University of Wisconsin, Madison, Wisconsin.
- . 1993. Primate conservation and ecotourism in Africa. In C.S. Potter, J.I. Cohen, and D. Janczewski, eds., *Perspectives on Biodiversity: Case Studies of Genetic Resource Conservation and Development*, 129–150. Washington, D.C.: AAAS Press.
- Werikhe, S.W, N. Mushenzi, and J. Bizimana. 1998. L'impact de la guerre sur les aires protégées dans la région des Grands Lacs: Le cas de la région des volcans Virunga. *Cahiers d'ethologie* 18:175–186.
- Williams, S.D., and P. Ntayombya. 1999. Akagera: An assessment of the biodiversity and conservation needs. Report of the Zoological Society of London – MINA-GRI. London.

Acronyms

AWF	African Wildlife Foundation
DGF	Direction Generale des Forêts
DFGF	Dian Fossey Gorilla Fund
DRC	Democratic Republic Congo
FFI	Fauna and Flora International
GTZ	German Technical Cooperation Agency
IGCP	International Gorilla Conservation Program
KRC	Karisoke Research Station
NGO	Non-Governmental Organization
ORTPN	Office Rwandais pour Tourisme et Parcs Nationaux
PCFN	Projet Conservation de la Forêt de Nyungwe
PNV	Parc National des Volcans
RPA	Rwandan Patriotic Army
RPF	Rwandan Patriotic Front
USAID	United States Agency for International Development
WCS	Wildlife Conservation Society
WWF	World Wildlife Fund/World Wide Fund for Nature

