A World Heritage Species Case Study: The Virunga Mountain Gorillas

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I. Introduction

The Virunga mountain gorilla is one of the rarest mammals on earth and is the second rarest of all of the gorilla subspecies.[1] Mountain gorillas were categorized as "critically endangered" on the IUCN Red List in 2000.[2] The most recent census, carried out in September and October 2003, estimated a population of 380 gorillas.[3] The Virunga mountain gorilla is threatened not only by traditional dangers but also by new threats from war, political unrest and other changing social/economic considerations that have exacerbated the main threat of habitat degradation and habitat loss.[4] Although the Virunga mountain gorilla is covered by several international treaties including the Convention on Migratory Species (CMS) and Convention on International Trade in Endangered Species (CITES), these international treaties have failed to address threats to gorilla habitat adequately.[5]

This memorandum summarizes the current status of the Virunga mountain gorilla and explores international agreements and local programmes that can be more strategically implemented to protect the Virunga mountain gorilla more effectively from habitat loss and

[1] As described in Section II, many consider the Virunga population of mountain gorillas and the Bwindi population of mountain gorilla to be separate subspecies. See infra part II.
[2] IUCN, *Gorilla beringei*, IUCN Red List of Threatened Species (2003), *at* http://www.redlist.org/search/details.php? species=39994.
[3] *Virunga Gorilla Census*, 28 Gorilla Journal (2004) *available at* http://www.berggorilla.de/english/gjournal/texte/28census.html (publication of final census report forthcoming).
[4] UNEP-WCMC, *Parc national des Virungas*, Protected Areas Programme, *at* http://www.unep-wcmc.org/sites/pa/0066p.htm (last modified May 1990).
[5] *See infra* Part V. (describing the various international agreements covering mountain gorillas).

degradation. Part II briefly reviews the literature concerning the taxonomic status of Virunga mountain gorilla as a subspecies or population. Part III examines the status of mountain gorillas. Part IV assesses the threats to their survival. Part V discusses how treaties such as the Conservation on Migratory Species, Convention on Biodiversity, World Heritage Convention, and Man and Biosphere Programme are operating currently and how they may be used in the future to protect Virunga mountain gorilla habitat.

II. The Taxonomy of Virunga Mountain Gorillas

While some doubt remains as to the taxonomy of gorillas, primatologists now appear to recognize two distinct species of gorilla: the western (*Gorilla gorilla*) and eastern (*Gorilla beringei*) respectively. In the western group, the isolated Nigeria-Cameroon gorillas are now recognised as a subspecies, Cross River Gorilla (*G. g. diehli*) and the Western Lowland Gorilla, (*G.g.gorilla*).

The eastern group includes the Eastern Lowland (*G.b.graueri*) and two mountain populations *G.b.beringei*. One mountain gorilla population lives in the area around Virunga Volcanoes where the borders of Uganda, Rwanda and the Democratic Republic of Congo meet The other lives in the Bwindi Impenetrable Forest in southwestern Uganda. The Virunga and Bwindi mountain gorillas were considered members of the same subspecies and comparative study of DNA tended to support this classification. Recent studies, however, indicate that the Bwindi gorillas are morphologically, ecologically, and behaviorally distinct.[6] Although the two populations exhibit physical and behavior differences, the level of mtDNA divergence may not be very high. As a result, the Bwindi population was not considered a separate subspecies for the purposes of the World Atlas Report[7] but the Great Ape Survival Project (GRASP) reports that the Bwindi gorillas "may form a fifth subspecies."[8]

At minimum, the Virunga population constitutes a distinct population and is included in the IUCN Red List as such. The Virunga population of mountain gorillas is geographically isolated from the Bwindi population of mountain gorillas by approximately 40km^2 of unforested area and do not interbreed.[9] Thus, this memo focuses on the Virunga mountain gorilla as a distinct population of *Gorilla beringei beringei* although it may not necessarily be a distinct subspecies.

III. The Status of Virunga Mountain Gorillas

The total estimated population of Virunga mountain gorillas is approximately 380 individuals. The population inhabits approximately 375 km^2 of contiguous forest in the Democratic Republic of the Congo (DRC), Rwanda and Uganda. The Virunga population occurs

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[6] Alastair McNeilage et al., *Bwindi Impenetrable National Park, Uganda: Gorilla and Large Mammal Census, 1997,* 35 ORYX 39, 39 (2001); H.D. Steklis et al., *The Mountain Gorilla: Conserving an Endangered Primate in Conditions of Extreme Political Instability,* 17 PRIMATE CONSERVATION 145, 145-51 (1997); IUCN, *2002 IUCN Red List of Threatened Species, at* http://www.redlist.org (2002).

[7] World Atlas of Great Apes, not for Citation.

[8] United Nations Environment Programme, *Great Ape Survival Project, Fact, Sheets at* http://www.unep.org/grasp/Fact_gorilla.asp.

[9] McNeilage, *supra* note 7, at 40.

entirely within the three contiguous national parks of these countries: the Virunga National Park of the DRC, the Volcans National Park in Rwanda (Parc National des Volcans) and the Mgahinga Gorilla National Park in Uganda, all of which are contiguous with one another and form a single area of gorilla habitat.

The Virunga mountain gorilla population appears to be gradually increasing in numbers though war and political unrest have hampered regular studies of the population. The Virunga mountain gorillas have been censused six times since 1970.[10] A census of the region in 2000 counted a minimum population of 359 gorillas.[11] The most recent, census carried out in September and October 2003, estimated a total of 380 gorillas, a 17% increase in population size since 1989 when the population was estimated at 324 gorillas.[12] The 2003 census reflected observations of at least 269 gorillas in 16 habituated[13] groups, 80 gorillas in 12 unhabituated groups and 11 solitary silverback males.[14] In gorillas, certain populations have been habituated to humans for research and conservation purposes and also to meet the growing demands of ecotourism.[15] However, habituated groups are often more susceptible to stress and disease transmission due to increased human contact.[16] The 2000 and 2003 Censuses reflect the best estimates of the current Virunga population because they come after a 10-year period of significant disturbance to the population due to war and political instability.

The growth of the Virunga mountain gorilla population should be viewed with caution because nearly all of the population growth can be attributed to the Research/Susa section of the Volcans National Park in Rwanda. This area is particularly good gorilla habitat and has been relatively well studied and protected. The overall growth is not necessarily reflective of growth in all Virunga gorilla sub-populations. In fact, other sub-populations, such as those within the Virunga National Park/DRC sector, are known to have experienced a decline in the number of gorillas.[17] Each of the national parks is discussed in further detail below as each park differs in their respective levels of protection and research capabilities.

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[10] Jose Kalpers et al., *Gorillas in the crossfire: population dynamics of the Virunga mountain gorillas over the past three decades*, 37 ORYX 326, 329 (2003) *at* http://www.eva.mpg.de/primat/pdf/Kalpersetal2003.pdf

[11] *Id.* at 326.

[12] *Virunga Gorilla Census*, 28 Gorilla Journal (2004) *available at* http://www.berggorilla.de/english/gjournal/texte/28census.html (publication of final census report forthcoming)

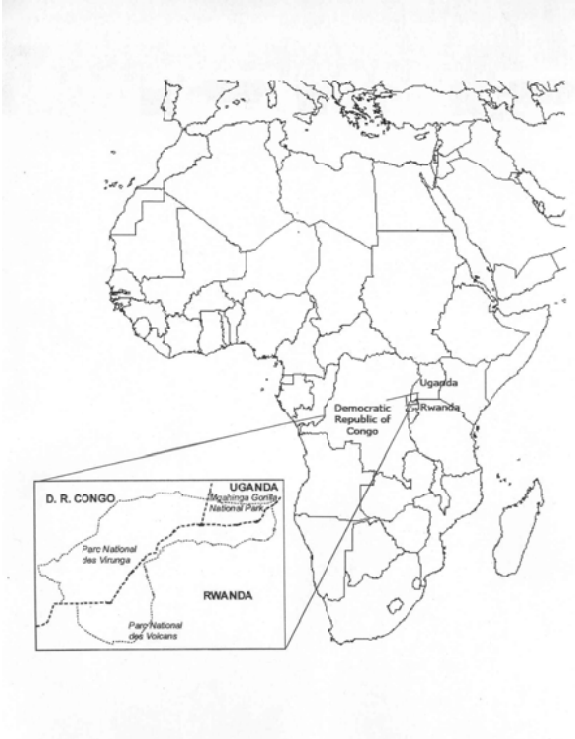
[13] Habituation is the process of repeatedly exposing an animal to a certain stimulus, such as humans, to the point that it stops responding. Michael Breed, *Habituation*, Animal Behavior Online *at* http://www.animalbehavioronline.com/habituation.html.

[14] *Virunga Gorilla Census*, 28 Gorilla Journal (2004), *supra* note 12.

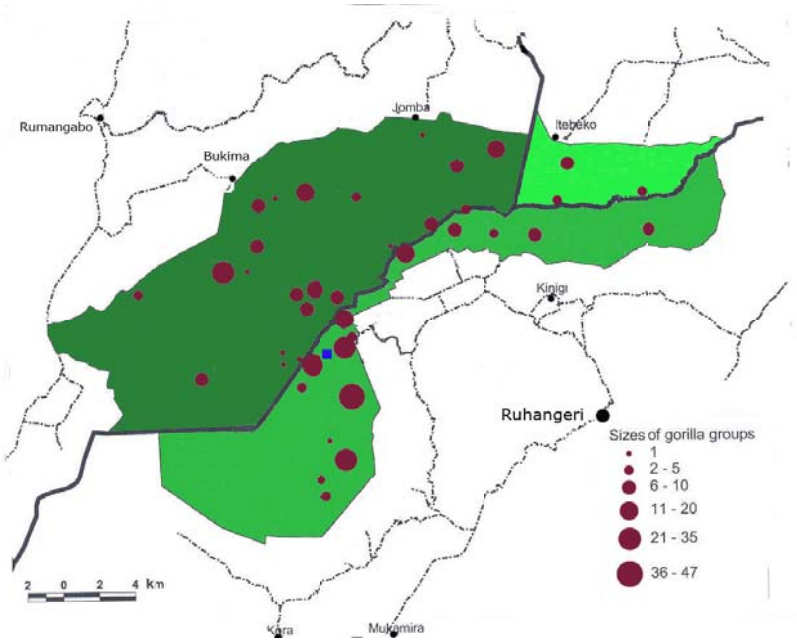
[15] *Mountain Gorilla Tourism: Some Costs and Benefits*, 22 Gorilla Journal (2001) *available at*, http://www.berggorilla.de/english/gjournal/texte/22tourliz.html.

[16] *Id.*

[17] Kalpers, *supra* note 10, at 331-34.



Map 1. Range States: Democratic Republic of Congo, Rwanda, Uganda.



Map 2. Gorilla Populations of Virunga National Park, Volcans National Park and Mgahinga National Park.

Finally, whether the Virunga mountain gorilla population is even sustainable, despite its recent growth is unclear, because mountain gorillas have very slow breeding and maturation rates. The estimated minimum viable population[18] size needed to maintain a population of mountain gorillas (Virunga and Bwindi populations included) for 40 generations with a 99% probability is 11,919 mature adult gorillas.[19]

A. Virunga National Park (Democratic Republic of the Congo)

The Virunga National Park is located in northeastern DRC, is 7,900 km^2 in area, and has a 650 km long boundary with a buffer zone. The mountain gorillas are currently limited to a 211 km2 area in the southwest section of the park. Virunga National Park is a listed Natural World Heritage Site, meeting the parts ii, iii, and iv of the World Heritage's natural site criteria.[20]

The park contains at least seven habituated groups totaling 75 gorillas and an undetermined number of unhabituated groups.[21] As noted above, however, although the overall Virunga mountain gorilla population has increased since 1989, the population in the Virunga National Park has declined.[22]

The park has been heavily affected by the war in Rwanda and the subsequent influx of refugees, and by civil unrest in the DRC. Approximately 2 million refugees now use the parks boundaries and designated buffer zone areas for residence and cultivation.[23] Increased numbers of refugees have increased the demands for fuelwood on the Virunga forest and mountain gorilla habitat. Unlike the Bwindi National Park where the gorilla population has remained relatively stable in spite of external threats, there has been an established negative correlation between human influence and gorilla population viability in the Virungas.[24] The Mwaro corridor, a parcel of land connecting the two sub-sectors of the Virunga National Park was threatened by severe deforestation in the last year for security and agricultural purposes but is currently being addressed by local and international organizations such as the International Gorilla Conservation Programme (IGCP).[25]

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[18] Minimum viable population is the estimated smallest population size required for a species to having a good chance of survival for a given length of time. M.L. Shaffer et al., *Population Viability Analysis and Conservation Policy, in* Population Viability Analysis (S.R. Bessinger& D.R. Mccullough eds., 2000)

[19] David Reed, *Estimates of Minimum Viable Population Sizes for Vertebrates and Factors Influencing those Estimates*, 113 Biological Conservation 32 (2003) *at* http://bio-www.uia.ac.be/bio/deco/reed_pva.pdf

[20] UNEP-WCMC, *Virunga National Park World Heritage Site*, Protected Areas Programme, *at* http://www.unep-wcmc.org/protected_areas/data/wh/virunga.html (last modified October 1998).

[21] *Id*.

[22] Kalpers, *supra* note 10, at 333.

[23] UNEP-WCMC, *supra* note 20.

[24] McNeilage, *supra* note 7, at 42.

[25] DRC Crisis in PNVi: Encroachment of Mikeno Sector, *at* www.berggorilla.de/igcp-mikeno.doc. The IGCP worked with the military and government authorities to halt the deforestation and the cleared area has since been replanted. IGCP, *Influencing Policy*, at http://www.mountaingorillas.org/our_work/our_influencing.asp

B. Parc des Volcans (Rwanda)

The Volcans National Park of Rwanda is about 127 km^2 in area but is contiguous to the Virunga and Mgahinga National Parks. The park does not have a buffer zone. The area is a listed National Park and Biosphere Reserve and is currently listed as a candidate Natural World Heritage Site.[26]

The gorilla population of the Volcans National Park comprises approximately 132 individuals in 4 groups that are all habituated for tourism.[27] As noted above, the Volcans National Park is an area that is now relatively well protected, where the gorilla population has increased. Nevertheless, the park has suffered from increased human presence, social instability, genocide, and war. The park was closed for tourism in 1991 when war broke out and was reopened again in July 1999. Since then, the demand for research and tourism has increased significantly. Even with the lapse in studies due to political unrest, this national park and its gorilla population has been documented very well in part due to the proximity to the Karisoke Research Center.[28]

C. Mgahinga Gorilla National Park (Uganda)

The Mgahinga Gorilla National Park is approximately 33 km^2 in area and is located in the extreme southwest of Uganda, on the borders with DRC and Rwanda. The park is contiguous to Virunga National Park and Volcans National Park. It was established as a National Park specifically for the protection of the mountain gorilla in 1991 and is currently listed as a candidate Natural World Heritage Site.

Very little information is available for the mountain gorillas in Mgahinga National Park. The park supports between 23 and 57 individuals in four distinct groups, at least one of which is a migrating group of 10 from Volcans National Park.[29] These small numbers are currently stable but may be threatened unless conservation efforts focus on including this small park with the larger Virunga and Volcans National Parks. This park is already reduced to a size which may not be large enough to support viable populations of some species were it not for the neighboring protected areas in DRC and Rwanda. The park is fairly new (created in 1992) and there are still significant remnants of human influence including deforested zones due to past agricultural and pastoral activities.[30]

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[26] UNEP-WCMC, *Parc national des Volcans*, Protected Areas Programme, *at* http://www.unep-wcmc.org/sites/pa/0360p.htm (May 1985).
[27] Kalpers, *supra* note 10, at 326.
[28] Andrew J. Plumptre & Elizabeth A. Williamson, *Conservation Oriented Research in the Virunga Region, in* Mountain gorillas: Three decades of research at Karisoke, 361-389 (Martha M. Robbins et al. eds., 2001).
[29] Ignatius Achoka, *Gorillas in Mgahinga Park, August 1997 to July 1998*, 17 GORILLA JOURNAL, *available at* http://www.berggorilla.de/english/gjournal/texte/17mgahin.html; Ursula Karlowski & Iris Weiche, *Mgahinga Gorilla National Park*, 15 GORILLA JOURNAL, *available at* http://www.berggorilla.de/english/gjournal/texte/15mgahin.html; *Kalpers*, supra note 6, at 332.
[30] W.M. ADAMS & MARK INFIELD, COMMUNITY CONSERVATION AT MGAHINGA GORILLA NATIONAL PARK, UGANDA. COMMUNITY CONSERVATION RESEARCH IN AFRICA 18-21 (Community Conservation Research in Africa Principles and Comparative Practice, Working Paper No. 10 1998), *at* http://www.sed.manchester.ac.uk/idpm/publications/archive/cc/cc_wp10.pdf; Karlowski & Weiche, *supra* note 35.

IV. Threats to the Virunga Mountain Gorillas

Habitat loss and degradation are the primary threats to the Virunga mountain gorillas. In Rwanda, Uganda and eastern DRC, 91% of the population practices subsistence farming that usually entails converting forest into agricultural land at an unsustainable rate.[31] In the Mgahinga National Park the pressure to clear forestland comes mainly from agricultural demands; in the Virunga National Park the pressure comes from commercial logging and the demand for fuelwood.[32] The influx of refugees due to political unrest has exacerbated habitat loss, often pushing agricultural activities onto national park land as in the Virunga National Park. The issue of habitat preservation and protection against loss is especially important when taking into account the already limited habitat of the Virunga mountain gorilla. The current range of the Virunga mountain gorillas is approximately 375 km^2. Since the Virunga mountain gorillas occur at an approximate density of 0.85-1.00 per km^2, [33] the current population of 380 individuals is already nearing its maximum density within available protected areas. If the Virunga mountain gorilla population continues to grow, the amount of available habitat will likely be a limiting factor on that growth. Conversely, if habitat loss increases with continuing human encroachment, the population may decrease.

Hunting for consumption and the local pet trade continue as minor threats, although domestic legislation and some international treaties already address these threats to some degree. The DRC, Uganda, and Rwanda have domestic legislation that bans the take, possession, transport, and/or national trade of the mountain gorilla and other species unless permitted by authorities.[34] However these orders are often ignored by the public.[35] International treaties targeting the take of mountain gorillas, such as the African Convention on the Conservation of Nature and Natural Resources, are similarly plagued with poor compliance.[36]

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[31] International Gorilla Conservation Programme, *Threats to the Survival of mountain gorillas*, *at* http://www.mountaingorillas.org/gorillas/gorillas_threats.htm (last visited Nov. 16, 2004).

[32] World Atlas, not for citation.

[33] McNeilage, *supra* note 7 at 40.

[34] Décret du 21 avril 1937 portant régime de la chasse et de la pêche [Decree on Hunting and Fishing] IV Legislation Economique II (1937) (prohibiting the possession, transport, and/or national trade of the mountain gorilla in Uganda), *available at* http://faolex.fao.org/docs/pdf/cng1600.pdf; Décret-loi du 26 avril 1974 portant confirmation et modification de l'ordonnance-loi du 18 juin 1973 portant création de l'Office rwandais du tourisme et des parcs nationaux [Creation of the Rwandan Office of Tourism and National Parks] III Disposition Organiques I (1974) (creating the ORTPN in Rwanda which controls the protected areas dictates that hunting, fishing, living and scientific research are prohibited in all the protected areas unless authorized by the Managing Director or his deputy), *available at* http://faolex.fao.org/docs/pdf/rwa4261.pdf; Management Plans, III Uganda Wildlife Statute 14 (1996) (prohibiting the take of mountain gorillas), *available at* http://www.ecolex.org/servlet/mhs2.RequestServlet?instid=ecolex-mhs&hidedbs=&hidefields=&user=anonymous&assortment=&output=html&MFN=006517&databases=faolex&connector=and&language=en&output=html.

[35] *See, e.g.*, Steve Blake, A reconnaissance survey in the Kabo logging concession south of the Nouable-Ndoke National Park North Congo, Wildlife Conservation Society (1994) (stating that the chief of police in Kabo was seen selling large quantities of gorilla meat), *available at* http://www.4apes.com/bushmeat/report/bushmeat.pdf

[36] Organization of African Unity, African Convention on the Conservation of Nature and Natural Resources, *available at* http://www.iucn.org/themes/wcpa/wpc2003/pdfs/outputs/africa/africa_pasconvention.pdf.

V. Proposals to Implement the World Heritage Species Concept for Virunga Mountain Gorillas

The proposed criteria broadly define World Heritage Species as those species with "outstanding universal value."[37] A species may have "outstanding universal value" in the general sense that its "cultural" or "natural" value is invaluable to world heritage as a whole.[38] Such a species may represent some connection or link to humans or biodiversity that would be irreplaceable legacies for future generations.[39] Species may exhibit "outstanding universal 'natural' value" by demonstrating "ecological, biological, genetic," or "other values that warrant international protection."[40]

The Virunga mountain gorillas are an excellent example of a species that has enormous ecological, biological, and genetic values. The Virunga mountain gorilla subspecies is *endemic*[41] to the Virunga Mountains in Rwanda, Uganda, and the Democratic Republic of Congo (DRC) and Bwindi Forest in Uganda.[42] Since the Virunga mountain gorillas are not widespread and confined to only one contiguous protected areas, they are of great conservation concern and ecological value. The Virunga mountain gorillas, like all great apes, are also a *keystone species* in that they play an important role in the forest as seed predators and seed dispersers which in turn impacts forest regeneration and tree species diversity.[43] Thus, the Virunga mountain gorillas play an essential biological role in maintaining the health of the ecosystem. Finally, mountain gorillas share 97 percent of their genetic makeup with humans and thus have unique genetic value that is invaluable to humans.[44] The disappearance of gorillas would "destroy a bridge to our own origins,"[45] the very "heritage" that the WHS concept seeks to protect.

Moreover, the Virunga mountain gorillas should be considered a World Heritage Species because they are a species that "warrant[s] international protection."[46] This provision "ensure[s] that any species particularly endangered by extinction is given the benefits of international protection and conservation."[47] As a "critically endangered" population threatened by low population numbers and habitat loss[48] that inhabits three separate national parks in three different

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[37] Proposed Draft Criteria for World Heritage Species, § A, *supra* note 6 (on file with IELP).
[38] *Id.* at § A(1)-(2).
[39] Proposed Draft Criteria for World Heritage Species: Overview, *supra* note 6, at 1.
[40] World Heritage Species Convention, *supra* note 31, § A(2)(a)(i)-(iv).
[41] An endemic species is one that is only found in a particular region and nowhere else in the world. Albertine Rift Programme, *Endemic Species of the Albertine Rift, at* http://albertinerift.org/arift-home/arift-species/endemic (last accessed Apr. 25, 2002).
[42] UNEP-WCMC, Parc National des Volcans, *supra* note 26.
[43] Joanna E. Lambert & Paul A. Garber, *Evolutionary and Ecological Implications of Primate Seed Dispersal,* 45 AM. J. OF PRIMATOLOGY 9, 9–28 (1998).
[44] Charles G. Sibley & Jon Ahlquist, *The Phylogeny of the Hominid Primates as Indicated by DNA-DNA Hybridization*, 20 J MOL EVOL. 2, 2-15 (1984).
[45] Tim Radford, *Countdown to Extinction for World's Great Apes*, GUARDIAN, Nov. 26, 2003 *available at* http://www.guardian.co.uk/conservation/story/0,13369,1093123,00.html.
[46] Proposed Draft Criteria for World Heritage Species, § (A)(2)(a)(iv), *supra* note 6 (on file with IELP).
[47] Proposed Draft Criteria for World Heritage Species: Overview, *supra* note 6, at 3.
[48] *See supra* Part I. (describing the population numbers of the Virunga mountain gorilla and the IUCN's "critically endangered" listing).

countries, the Virunga population of mountain gorilla undoubtedly "warrant[s] international protection." International cooperation through treaties or local programmes is imperative to address the common threats against the Virunga mountain gorillas and ensure their continued existence.[49]

The greatest threat to the survival of the mountain gorillas is the continuing human pressures on their already fragile habitat. A conservation scheme for the Virunga mountain gorillas must therefore strive to maintain the protections on existing national parks while ensuring that those parks remain part of a contiguous ecosystem. Comprehensive protection of the entire region will require more cooperation between the range states to ensure proper gene flow and maintenance of a viable population size. A successful conservation scheme must also address the needs of local communities since people in that region have historically depended on the forests of mountain gorilla habitat for food and other natural resources. Thus, an ideal conservation scheme would incorporate transboundary conservation mechanisms with emphasis on cooperation with local communities. Several existing international treaties have already addressed these problems to some degree with limited success. However, the World Heritage Species concept may provide a more effective strategy in combining provisions of these existing treaties to conserve species in need of specific conservation efforts.

The purpose of the World Heritage Species concept is to "provide the means to better utilize and implement existing international law to conserve species that are in need of more concentrated and specific conservation efforts."[50] As stated in previous parts, international cooperation through treaties or local programmes is imperative in addressing the common threats against the Virunga mountain gorillas and ensuring their continued existence. This memo discusses how treaties such as the Conservation on Migratory Species, Convention on Biodiversity, World Heritage Convention, and Man and Biosphere Programme are operating currently and how they may be used in the future under the World Heritage Species Convention to protect Virunga mountain gorilla habitat.

This memo concludes that the Virunga mountain gorillas would be best protected using a combination of both CMS and MAB. Range states may use CMS and MAB to ensure habitat protection focused on transboundary protection, geared toward the biological needs of the mountain gorilla, and supported by the local community. Specifically, States could increase regional cooperation by creating their own Article IV agreements under CMS. States should also utilize the MAB programme's provisions for fostering local cooperation while ensuring conservation of critical mountain gorilla habitat within a "core area…devoted to long-term protection."

A. The Convention on Migratory Species

The Convention on Migratory Species (CMS) has an exclusive focus on migratory species that are endangered or have an unfavorable conservation status. Because of CMS's its provisions encouraging transboundary cooperation in the conservation and management of migratory species, CMS could be a vital tool for protecting the mountain gorillas whose natural

[49] *See infra* part IV.
[50] Proposed Draft Criteria for World Heritage Species: Overview, *supra* note 6, at 1.

range spans three countries. CMS also includes several provisions requiring to protect habitat and prevent hunting.

The Parties have included mountain gorillas in Appendix I species as an endangered species.[51] Under Article III of CMS, Parties must conserve and restore the habitat of Appendix I species, prevent or control factors that might endanger them, and prevent, remove, or minimize activities that impede their migration.[52] In addition, Article III prohibits the taking of Appendix I species except in some limited circumstances.[53] The DRC and Uganda are both Parties to CMS and thus are subject to these Article III provisions.[54] Although Rwanda is not a Party, it has announced that it will most likely become a member in the near future.[55]

Even if Rwanda does not become a Party to CMS, it may still participate in transboundary conservation efforts through CMS provided that the CMS Parties include the mountain gorilla in Appendix II. A species may be included in Appendix II if its conservation status is "unfavourable": data indicate that the species in not maintaining itself on a long-term basis as a viable component of the ecosystem, that range of the migratory species is being or likely to be reduced; insufficient habitat exists to maintain the population on a long-term basis; or the distribution and abundance of the species do not approach historic coverage and levels. In such cases, and mountain gorillas appear to easily meet these criteria, Parties and non-Parties alike may develop and implement "Article IV agreements." [56] Indeed, the Fifth Meeting of the Conference of the Parties (COP 5), in 1997, named the mountain gorilla as one of seven species that should "be the subject of concerted actions."[57] The Sixth Meeting of the Conference of the Parties (COP 6) in 1999 and Seventh Meeting of the Conference of the Parties (COP 7) in 2002 recommended that those "concerted actions" continue until 2005.[58]

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[51] Convention on the Conservation of Migratory Species of Wild Animals, June 23, 1979, Art. III [hereinafter Convention on Migratory Species], *available at* http://www.cms.int/documents/convtxt/cms_convtxt.htm. Mountain gorillas have been listed on the Convention's Appendix I ever since the Convention was concluded in 1979. Convention on Migratory Species, List of Common Names, Appendices I and II (as of March 2004), *available at* http://www.cms.int/documents/appendix/cms_app1.htm. Appendix I of CMS includes *Gorilla gorilla beringei*. While this listing is intended to cover mountain gorillas, the Parties have not yet amended Appendix I to account for the change in classification of mountain gorillas to *Gorilla beringei beringei.*

[52] Convention on Migratory Species, *supra* note 51, at art. III(4).

[53] *Id.* at art. III(5).

[54] CMS entered into force in the DRC on January 9, 1990 and in Uganda on January 8, 2000. Parties to the Convention on the Conservation of Migratory Species of Wild Animals (as of December 1, 2004), *available at* http://www.cms.int/pdf/en/party_list/Partylist_eng.pdf.

[55] Klaus Toepfer, Speech at the 25th Anniversary of the Convention on Migratory Species (June 23, 2004), transcript *at* http://www.unep.org/Documents.Multilingual/Default.Print.asp?DocumentID=400&ArticleID=4538&l=en (last accessed Mar. 25, 2005).

[56] Convention on Migratory Species, *supra* note 51, at art. IV(3).

[57] *Resolution 5.1 Concerted Actions for Appendix I Species*, Fifth Meeting of the Conference of the Parties (COP 5) (Apr. 10-16, 1997), *at* http://www.cms.int/bodies/COP/cop5/cop5_res.htm (last accessed Mar. 25, 2005);

[58] *Resolution 6.1 Concerted Actions for Appendix I Species*, Sixth Meeting of the Conference of the Parties (COP 6) (Nov. 10-16, 1999), *at* http://www.cms.int/pdf/Res_6_01.pdf (last accessed Mar. 25, 2005); *Resolution 7.1 Concerted Actions for Appendix I Species*, Seventh Meeting of the Conference of the Parties (COP 7) (Sept. 18-24, 2002), *at* http://www.cms.int/bodies/COP/cop7/proceedings/pdf/en/part_I/Res_Rec/RES_7_01_Concerted_Actions.pdf (last accessed Mar. 25, 2005).

Article IV agreements encourage greater regional cooperation to conserve and manage migratory species (or a geographically separate part of the population or any species or lower taxon of wild taxon of wild animals[59]) and frequently include non-Parties.[60] Such agreements foster regional cooperation by calling on the members of the agreement to coordinate conservation and management plans; provide for research and the exchange of information; maintain, restore and protect habitats; restrict impediments to migration; and create procedures for cooperative action against illegal taking.[61] Although CMS provides that Article IV agreements "should" include these factors "where appropriate and feasible,"[62] CMS provides the institutional and legal framework for tailoring conservation and management measures according to the needs of the range States and the species or population at issue.

An Article IV agreement could help foster better cooperation between the Range States. In June 2004, Dr. Klaus Toepfer, Executive Director of UNEP, recognized that the warfare in the Virunga region cannot be controlled by any one State and he appealed to the Rwandan Government, as a potential new Party to CMS, to halt forest degradation in the area and to strengthen its cooperation with the other two range states of mountain gorillas—Uganda and the DRC.[63] The Convention on Biological Diversity (CBD)supports the goal of cooperative action through CMS by calling on CBD Parties to cooperate on matters of "mutual interest" through "competent international organizations."[64]

B. The World Heritage Convention (WHC)

The WHC protects cultural and natural heritage of "outstanding universal value" by designating areas containing those resources as World Heritage sites.[65] Because the Virunga mountain gorillas live in relatively close proximity to each other and because some mountain gorilla habitat exists within previously designated World Heritage Sites, the site-specific rather than species-specific approach of the WHC may prove useful for the conservation and management of the Virunga mountain gorillas.

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[59] Convention on Migratory Species, *supra* note 51, at art. I(1)(a).

[60] For example, the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) includes non-Parties such as Lebanon, Mauritius, Sudan, and Equatorial Guinea in protecting waterbirds that were ecologically dependent on wetlands in Africa and Eurasia, including the Middle-East, Greenland and parts of Canada. Agreement on the Conservation of African-Eurasian Migratory Waterbirds, Dec. 1, 2004, *at* http://www.cms.int/pdf/en/summary_sheets/AEWA_Agr_Sum_Sheet.pdf. The Memorandum of Understanding (MoU) concerning Conservation Measures for the Siberian Crane includes seven non-party countries out ten total participants Memorandum of Understanding concerning Conservation Measures for the Siberian Crane, Grus leucogeranus, Dec. 1, 2004, *at* http://www.cms.int/pdf/en/summary_sheets/Siberian_Crane_Agr_Sum_Sheet.pdf; *See* Convention on Migratory Species, Countries Participating in CMS Agreements/MoU that are Not Yet Parties to CMS, *at* http://www.cms.int/pdf/en/party_list/Nonparties_participating_in_CMS_Agreements.pdf (last accessed Mar. 25, 2005).

[61] Convention on Migratory Species, *supra* note 51, at art. V(4)-(5).

[62] *Id.* at art. V § 5.

[63] http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=400&ArticleID=4538&l=en.

[64] Convention on Biological Diversity, June 5, 1992, art. 5, 1760 U.N.T.S 79, *available at* http://www.biodiv.org/doc/legal/cbd-en.pdf (last accessed Mar. 25, 2005).

[65] Convention Concerning the Protection of the World Cultural and Natural Heritage, Nov. 23, 1973, art. 2, 27 U.S.T. 40 [hereinafter World Heritage Convention], *available at* http://whc.unesco.org/world_he.htm (last accessed Mar. 25, 2005).

The Virunga mountain gorillas currently live in the Virunga Volcano Range of Rwanda, Uganda, and the DRC. The Virunga Volcano Range is an extremely diverse and productive ecosystem and as such presents the range States with excellent candidate sites for inclusion as a World Heritage Site. The DRC, Uganda and Rwanda are all parties to the WHC.[66]

The three governments could develop a transboundary "Mountain Gorilla World Heritage Site" using as the core the three existing national parks with mountain gorillas: Virunga National Park in the DRC, Volcans National Park in Rwanda, and Mgahinga National Park in Uganda. These national parks have obvious biological or natural value due to the presence of the mountain gorillas, but they are also adjacent or nearly adjacent to each other. In fact, Virunga National Park in the DRC is already a WHC site.[67] Moreover, transboundary sites do not always have to be physically contiguous so long as they are linked by watershed or critical habitat characteristics.[68] (It would also be possible to add Bwindi Impenetrable Forest in Uganda, which is already World Heritage Site, for a larger "Mountain Gorilla World Heritage Site" that includes the Bwindi population (or subspecies) of mountain gorilla).[69] The World Heritage Convention specifically encourages international cooperation between State Parties for facilitating transboundary protection as part of the State's commitment to protect "world heritage."[70]

Virunga National Park is the oldest and the largest of the three national parks but has been heavily affected by the war in Rwanda and the subsequent influx of refugees, and by civil unrest in the DRC.[71] Approximately 2 million refugees now use the park's boundaries and designated buffer zone areas for residence and cultivation.[72] Increased numbers of refugees have increased the demands for fuelwood on the Virunga forest and mountain gorilla habitat.[73]

Volcans National Park in Rwanda was listed as a candidate natural World Heritage Site in 1985, but since then the Rwandan government has not taken further action since ratifying the Convention in 2000.[74] As with Virunga National Park, Volcans National Park has suffered from

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[66] UNESCO World Heritage, States Parties, *at* http://whc.unesco.org/pg.cfm?cid=246 (last accessed Mar. 25, 2005).
[67] UNESCO World Heritage, Virunga National Park, *at* http://whc.unesco.org/pg.cfm?cid=31&id_site=63 (last accessed Mar. 25, 2005).
[68] NATARAJAN ISHWARAN & SEEMA PAUL, *Transboundary Conservation and Protected Areas in the 21st Century, in* ITTO/IUCN INTERNATIONAL WORKSHOP ON INCREASING THE EFFECTIVENESS OF TRANSBOUNDARY CONSERVATION AREAS IN TROPICAL FORESTS (2003), *at* http://www.tbpa.net/workshops/ITTO/Thailand_2002/Conference%20Proceedings/Written%20papers/NatarajanIshwaran.pdf.
[69] Indeed, Natarajan Ishwaran, then the Chief of the Natural Heritage Section at the UNESCO World Heritage Centre, encouraged the UN Foundation, UNESCO and GRASP to create a trans-border conservation initiative grouping the Virunga National Park (in the DRC), and, with the Volcans National Park (in Rwanda), since all three are critical to conserving the habitats of the mountain gorillas. *Id.*
[70] World Heritage Convention, *supra* note 68, arts. 6-7.
[71] UNEP-WCMC, Virunga National Park World Heritage Site, Protected Areas Programme, *at* http://www.unep-wcmc.org/protected_areas/data/wh/virunga.html (last accessed Mar. 25, 2005).
[72] *Id.*
[73] *Id.*
[74] UNEP-WCMC, Parc national des Volcans, Protected Areas Programme, *at* http://www.unep-wcmc.org/sites/pa/0360p.htm (last accessed Mar. 25, 2005). As of May, 2004, Rwanda has not submitted a tentative list in conformity with the requirements of the Operational Guidelines as is necessary for acceptance as a World Heritage Site. UNESCO, Tentative Lists of States Parties Submitted as of 15

increased human presence due to social instability, genocide, and war. The park was closed for tourism in 1991 when war broke out and was reopened again in July 1999. Since then, the demand for research and tourism has increased significantly and protection in this park has increased. Even with the lapse in studies due to political unrest this national park and its gorilla population has been documented very well in part due to the proximity to the Karisoke Research Center.[75]

The Mgahinga National Park in Uganda has been a candidate natural World Heritage Site, but Uganda did not include it on the tentative list, or nomination list, of five cultural World Heritage Sites submitted to the World Heritage Committee in 1997.[76] Created in 1992, Mgahinga National Park the park is still marked by remnants of human influence including deforested zones due to past agricultural and pastoral activities.[77] The park supports between 23 and 57 mountain gorillas in four distinct groups, at least one of which is a migrating group of 10 from Volcans National Park.[78] As a result, its inclusion as a World Heritage Site, particularly one that abuts Volcans National Park, would help ensure continuous gene flow between mountain gorilla groups.

In protecting the habitat of the mountain gorilla, emphasis should be placed first on expanding the World Heritage Site to include the Volcans and Mgahinga National Parks and second on strengthening the current border protections of the Virunga National Park. It is essential that the Volcans National Park be listed as a World Heritage site since that park includes the second largest population of the Virunga mountain gorillas. It is equally important that the Mgahinga National Park be included as a World Heritage Site so as to include its small gorilla population within the World Heritage legal regime.

The creation of such a transboundary World Heritage Site is supported not only by the CBD's call to cooperate in areas of mutual interest, but also by its requirements to establish "protected areas;" promote the protection of ecosystems, habitat, and minimum viable populations of species in their natural surroundings; and to promote the recovery of threatened

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May 2004 in Conformity with the Operational Guidelines, COM (04)28 [hereinafter Tentative List] *at* http://whc.unesco.org/archive/2004/whc04-28com-14ae.pdf (last accessed Mar. 25, 2005). Rwanda does not currently have any listed World Heritage Sites. UNESCO World Heritage, World Heritage List, *at* http://whc.unesco.org/pg.cfm?cid=31&l=EN (last accessed Mar. 25, 2005).

[75] Andrew J. Plumptre & Elizabeth A. Williamson, Conservation Oriented Research in the Virunga Region, in Mountain gorillas: Three decades of research at Karisoke, 361-389 (Martha M. Robbins et al. eds., 2001).

[76] Tentative List, *supra* note 71.

[77] WILLIAM ADAMS & MARK INFIELD, COMMUNITY CONSERVATION AT MGAHINGA GORILLA NATIONAL PARK, UGANDA. COMMUNITY CONSERVATION RESEARCH IN AFRICA 18-21 (Community Conservation Research in Africa Principles and Comparative Practice, Working Paper No. 10, 1998), *at* http://www.sed.manchester.ac.uk/idpm/publications/archive/cc/cc_wp10.pdf; Ursula Karlowski & Iris Weiche, Mgahinga Gorilla National Park, 15 GORILLA JOURNAL, *available at* http://www.berggorilla.de/english/gjournal/texte/15mgahin.html.

[78] Ignatius Achoka, Gorillas in Mgahinga Park, August 1997 to July 1998, 17 GORILLA JOURNAL, *available at* http://www.berggorilla.de/english/gjournal/texte/17mgahin.html; Kalpers, supra note 6, at 332; Karlowski & Weiche, supra note 79.

species.[79] CBD Parties must also manage the resources within or outside those protected areas to ensure their conservation and sustainable use.[80]

One of the primary problems with the establishment of the World Heritage Site in the DRC has been the park's failure to resist human pressure leading to the degradation of mountain gorilla habitat. The park has been heavily affected by the war in Rwanda and the subsequent influx of refugees, and by civil unrest in the DRC. Refugees now use up to 60% of the park's boundaries and designated buffer zone areas for residence and cultivation, though the area inside the park remains relatively unsettled.[81] One solution to this problem may be using the WHC in conjunction with the Man and Biosphere Programme (see next section), which specifically addresses the need for local cooperation by initiating funding opportunities for locals while ensuring conservation of critical mountain gorilla habitat within a "core area…devoted to long-term protection."[82]

C. Man and Biosphere Programme

The Man and Biosphere Programme (MAB) facilitates sustainable development through designations of biosphere reserves that balance conservation and resource use. To meet the challenges of conservation and sustainable development, biosphere reserves should have three basic functions: 1) a conservation function — to contribute to the conservation of landscapes, ecosystems, species and genetic variation; 2) a development function — to foster economic and human development which is socio-culturally and ecologically sustainable; and 3) a logistic function — to support research, monitoring, education and information exchange related to local, national and global issues of conservation and development.[83]

In addition, an area must meet several criteria for designation as a biosphere reserve. The area must 1) encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human interventions, 2) be of significance for biological diversity conservation, 3) provide an opportunity to explore and demonstrate approaches for sustainable development, 4) be of an appropriate size to serve the three functions, and 5) provide for involvement and participation of authorities, communities, and private interest.[84]

The Volcans Biosphere Reserve (150 km2) was designated in 1983 and overlays the Volcans National Park in Rwanda.[85] The DRC has three biosphere reserves but none of them

[79] Convention on Biological Diversity, *supra* note 66, art. 8(a), (d), (f).
[80] *Id.* at art. 8(e).
[81] UNEP-WCMC, *Virunga National Park World Heritage Site*, Protected Areas Programme, *at* http://www.unep-wcmc.org/protected_areas/data/wh/virunga.html (last accessed Mar.25, 2005).
[82] UNESCO, Man and the Biosphere Programme, THE STATUTORY FRAMEWORK FOR THE WORLD NETWORK OF BIOSPHERE RESERVES, art. 4, part 5(a), http://www.unesco.org/mab/docs/statframe.htm (last accessed Mar. 25, 2005).
[83] *Id.* at art. 3.
[84] *Id.* at art. 4, part 4.
[85] UNESCO, Man and the Biosphere Programme, Volcans Biosphere Reserve Information, *available at* http://www2.unesco.org/mab/br/brdir/directory/biores.asp?code=RWA+01&mode=all (last accessed Mar. 25, 2005).

overlap mountain gorilla habitat in Virunga National Park.[86] Uganda does not currently have any biosphere reserves.[87]

Designating the Virunga National Park as a biosphere reserve would seem relatively easy, because it has many of the same characteristics as the existing Volcans Biosphere Reserve. Both share similar ecosystems and are essential habitats of the mountain gorilla. One problem with the Virunga National Park is the presence of human activity within the park itself. It is not clear if a core zone of limited or low-impact human use can be established. On the other hand, Mgahinga National Park, at just $33km^2$, may not be large enough to fulfill the three functions of biosphere reserves. As with World Heritage Sites, however, support exists for transboundary biosphere reserves.[88] Thus, it may make sense to extend the Rwanda Biosphere to include the contiguous Virunga National Park in the DRC and Mgahinga National Park in Uganda called the Mountain Gorilla Transboundary Biosphere Reserve.

States may use MAB in conjunction with the CBD to further encourage the notion of "sustainable use."[89] In fact, MAB can be viewed as a means to reconcile conservation and resource consistent with the CBD's dual goals of conservation and sustainable use as well as its Ecosystem Approach.

Nonetheless, because MAB does not include periodic reporting, continuous international supervision through meetings of the parties, or technical assistance at the level of other international programs and treaties, it may not provide the best alternative for implementing the World Heritage Species concept. After an initial assessment of the site to determine its eligibility as a biosphere reserve,[90] MAB only provides that the status of a biosphere reserve should be reviewed every ten years.[91] Thus, while MAB offers an appealing conservation strategy, it may not provide range States with the necessary tools to conserve mountain gorillas differently from and more effectively than current conservation and management strategies.

[86] UNESCO, Man and the Biosphere Programme, World Network of Biosphere Reserves, *available at* http://www.unesco.org/mab/brlist.htm (last accessed Mar. 25, 2005).
[87] *Id.*
[88] UNESCO DARKAR OFFICE, FIRST AFRIMAB TECHNICAL WORKSHOP FOR FRANCOPHONE AFRICAN COUNTRIES (1999), *available at* http://www.dakar.unesco.org/documents/mab_finalrpt.htm (last accessed Mar. 4, 2005)
[89] Convention on Biological Diversity, *supra* note 66, at art. 10.
[90] Man and the Biosphere Programme, *supra* note 88, at art. IV
[91] *Id.* at art. IX