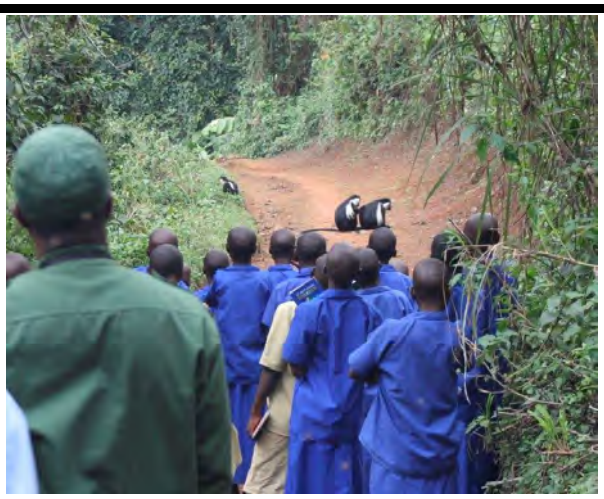
SUSTAINING BIODIVERSITY CONSERVATION IN AND AROUND NYUNGWE NATIONAL PARK (NNP)

EVALUATION OF CONSERVATION EDUCATION AND OUTREACH INITIATIVES AROUND NYUNGWE NATIONAL PARK

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CONTENT

1. INTRODUCTION

1.1. Background

Nyungwe National Park (NNP) is an area of global and national biodiversity significance. The national park and its surrounding landscape are home to a rich assemblage of wildlife and natural resources. In total, NNP is home to at least 275 species of birds, 140 species of orchids, and 13 species of primates—including the rare owl-faced monkey, over 400 Eastern chimpanzees, and groups of black-and-white colobus that number in the hundreds. NNP provides important benefits to people as well: it generates important tourism revenues and it is a critical catchment for Rwanda's fresh water, plays a key role in erosion control, flood prevention, and climate regulation.

Nyungwe became a national park in 2005, since this time there has been remarkable conservation achievements made and opportunities discovered. These successes notwithstanding, the forest still faces a range of critical threats. Human populations along the boundary of Nyungwe are some of the highest in Africa with as many as 500 people per square kilometre. Poverty in the area is severe. Animal poaching, fire, mining and the unsustainable harvesting of bamboo are the most immediate threats, because local people have few available substitutes. Fire is a severe threat, often resulting from the illegal harvesting of honey in the park. Illegal mining, which increases when gold and coltan prices are high, causes habitat destruction, water pollution and increases in bush meat demand.

Actively working with surrounding communities is a prerequisite for achieving conservation results in NNP. For local people to support the park and the conservation of its resources, they must not only benefit from it, but have a clear understanding of how they benefit from it. The main goal of education and outreach initiatives around NNP is to enable people to better understand the values of NNP and encourage them to adopt sustainable behaviour in support of park conservation efforts.

With support from USAID, WCS has been implementing the 5 years project 'Sustaining biodiversity conservation in and around Nyungwe National Park, Rwanda', from 2010 to 2015. The supportive objective of this project is that communities and government are able to benefit from the conservation of NNP. In this way the project aims to ensure that Rwanda benefits from the conservation of wildlife and sustainable use of ecosystem services in NNP.

The project is articulated around six broad strategies employed to guide interventions in support of biodiversity conservation. The sixth strategy revolves around "implementing education and outreach programs". Through this strategy, WCS, working with RDB and local education partners, has developed an Education and Outreach Strategy for NNP, in order to address both the immediate threats of unsustainable resource use, fire and mining as well as the long-term threat of degazettement. The strategy was to build on existing education and outreach activities to develop and implement an integrated set of education and communication tools and activities that reach two key audiences – students in formal education (Education), and out-of school youth and other vulnerable groups through social marketing (Outreach).

Based on the original project plan, the intended outputs of this strategy were that "students in formal education adopt supportive attitudes to park conservation based on a clear understanding of the multiple values of NNP, reduce the adoption of unsustainable behaviours as they grow into adults and out of school youth and other vulnerable groups gain new skills and an increased understanding of the multiple values of NNP, adopt supportive attitudes towards park conservation and reduce destructive behavior".

1.2. Education and Outreach Interventions around NNP

Initial conservation education work, supported by the US Fish & Wildlife Service, helped us initiate environmental clubs in 8 schools (4 primary and 4 secondary) surrounding the park, and working with teachers as well as District Environment Officers (DEOs). A suite of activities and materials promoting chimpanzee conservation were developed under this work. With the USAID project "Sustaining Biodiversity Conservation in and around Nyungwe National Park", we aimed at developing an

education and outreach program targeting school and out of school youth and communities, addressing the main threats and identifying specific alternatives.

With support from our Conservation Education Department at our Global HQ in the Bronx Zoo in New York, we undertook a series of baseline surveys- with general sectors of the population as well as schools and specific groups that influence the park to a large extent. Based on these surveys, we developed an elaborate Education and Outreach Strategy for NNP upon which we based the development of activities and materials used in the various components of the program.

In addition to the baseline surveys, we implemented a series of training workshops on conflict-sensitive conservation[1] in collaboration with the International Institute for Sustainable Development (IISD). The findings of these workshops as well as results of additional consultations with conservationists formed the basis of the Nyungwe National Park Conflict Analysis[2].

The main components of our education and outreach programs are detailed below.

1.2.1 School programs

a. Teachers program

We recognize the need to support local teachers in their vital role as educators. They are important partners in the goal of protecting NNP. Our commitment has been supporting and assisting teachers to become conservation educators. The teachers that we work with learn conservation education techniques and receive information about relevant conservation issues and materials for their students. WCS's Education Department encourages a focus on "multiplier audiences", this means engaging individuals with the power to teach others in great numbers. With this in mind, we recognize teachers as a "multiplier audience". Teachers are instrumental in the writing of education and outreach strategies, in the design of education materials/activities and in the delivery of conservation lessons to children, making them an excellent group to engage with our education and outreach initiatives.

b. Environmental Clubs

Children are an important constituency of our work, and one of the tools used to engage them is the establishment of environmental clubs at various levels including primary and secondary schools. Through the clubs, we offer students and teachers interactive learning opportunities that enable students of all ages to develop a deeper knowledge of Nyungwe forest, its values, threats to its existence, and the possible alternatives to natural resource use.

1.2.2 Public outreach

a. Animateur de Conservation (ANICOs)

In order to mitigate the threats to biodiversity within and surrounding NNP, we have worked to establish a network of 53 liaison volunteers, one in each cell[3] abutting the park. In addition to their role as community educators, they help to mitigate conflicts around the park through identifying threats in their areas and providing timely information to park wardens and the local government.

b. Social marketing & radio

Our social marketing and radio programming are part of the integrated set of outreach tools designed to target communities living near NNP. Social Marketing is a process that applies marketing principles and techniques to create, communicate and deliver value in order to influence target audience behaviours that benefit society (public health, safety, the environment and communities) as well as the target audience (Kotler et al. 2006) Using community events we have delivered conservation messages to thousands of people through music, tailor made drama, and quizzes.

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[1] **Conflict-sensitive conservation** (CSC) is conservation programming and implementation that takes into account the causes, actors and impacts of conflict in order to minimize conflict risks and maximize peace-building opportunities

[2] Crawforf, A. (2012). Conflict-Sensitive Conservation in Nyungwe National Park: Conflict Analysis. IISD Report.

[3] A Cell is the lowest administrative unit in the Rwanda Local Government Structure.

In 2013 in partnership with Media Impact (MI) and with funds from the USFWS, we piloted a radio communications program called "My Chimpanzee-My Community". The program follows entertainment-education and social marketing approaches. Such approaches are designed to encourage positive behaviour and social change through modeling desired changes using dramatic representations of people and communities with whom the audience can identify. The center piece of the radio program is "*AHAJISHE IGISABO*" a serial drama that weaves together relevant conservation information on chimpanzees in a compelling and entertaining way.

c. Community Enterprise development

We focus our support to cooperatives which involve ex-illegal users of forest products (poachers, beekeepers, wood collectors) in an attempt to reduce the pressure on the national park through providing alternatives. Our projects have included support to a beekeeping union (comprised of 13 cooperatives with some 800 members). We train our community partners in technical and business skills as well as environmentally sound production methods, and we provide necessary equipment and infrastructure. In addition, we work with specific communities to popularise fuel efficient technologies through the provision of energy saving cook stoves aimed at reducing the need for wood from the forest.

In order to reduce the drivers for poaching, we are working with three ex-poacher cooperatives by promoting access to affordable finance through local Savings and Credit Organisations (SACCOs). Our current efforts working with two such SACCOs are aimed at easing the requirements for credit in cases where credit is needed for specific activities with the potential to improve the well-being of reformed poachers.

1.3. Evaluation Objectives

In 2011, WCS Rwanda collected baseline data on awareness and attitudes towards NNP. This baseline information was crucial in guiding the development of the Education and Outreach Strategy and to help assess the effectiveness of education and outreach initiatives. To measure the impact and the extent of reach of the education and outreach interventions, a repeat phase of data collection was carried out at the end of the USAID project (Nov 2014), 3-years after the baseline data were collected. This report follows on from the baseline survey report; it documents changes over time (2011 and 2014) found in the knowledge, attitudes and behavior patterns of students in formal education and out of school people in the study locations around NNP. It summarizes in brief, the background and methodology to the surveys.

The purpose of the 2014 survey was to measure the impact of the investment in conservation education and outreach activities on the communities adjacent to NNP, in terms of changes in knowledge, attitudes and behaviours regarding the conservation of the park. We were interested in the following questions:

- Do students in schools in which conservation education activities were implemented know more about, and exhibit more positive attitudes and behaviours towards the conservation of NNP than students in schools where no conservation education activity was implemented?
- Did the level of awareness/support towards conservation of NNP change within community members following the implementation of the education activities?
- Did community members have any significant level of exposure to the WCS implemented outreach activities, and if so did this influence positively their knowledge and attitudes?

In addition, between 2013 and 2014 the interest in the scope of our interventions and other community conservation interventions has grown. In the 2011 baseline survey we explored only the knowledge, attitude and behavior of respondents in the study area. In the 2014 repeat survey, the scope was widened to measure the reach of education and outreach interventions, specifically how far messages and materials spread within the schools and communities where we worked.

2. METHODOLOGY

2.1. Survey Design

The evaluation was based on a pre and post-survey design with random sampling of participants in experimental and pre-identified control areas. Experimental areas included schools and cells where conservation education and outreach interventions were implemented. Control areas consisted of schools that did not have access to the conservation education program and cells in selected sectors that do not share a boundary with the Nyungwe National Park.

The survey included socio-economic information on the target population and information on knowledge, attitudes and behaviours towards the conservation of NNP. Similar information was collected from the control areas. The 2014 survey replicated the 2011 baseline using the same research instruments. The school and household questionnaire replicated the 2011 questionnaires with the addition of several questions on the exposure of respondents to project activities. While conducting the evaluation survey, the same information was collected from different respondents to those interviewed for the baseline in the same experimental and control areas.

2.2. Sampling Framework and Procedure

2.2.1 School Survey

Selection of survey schools was based on proximity to the national park (within 20Km from the park boundary) in order to hold constant any other factors that might influence conservation interventions. The school surveys were administered to students in 10 schools that represented three types of levels (Secondary 6 level and Senior 3 level and primary 6 level). Five were experimental schools, those in which education activities were conducted, and five control schools. Control schools were matched for district, type of school (Primary 6, Secondary 3, or Secondary 6), distance from NNP, and sector threat levels of fire and poaching. The student sample consisted of a total of 200 students, 100 from the experimental schools and 100from the control group. The Tables below shows the distribution of schools from which the student data was collected.

In each school, two classes were chosen. For S6[4] Schools, one grade was chosen randomly amongst classes S4, S5 and S6. One class from this grade was then chosen randomly. For S3[5] Schools, one grade was chosen randomly amongst classes S1, S2, and S3. In the primary school section, one grade was chosen randomly amongst classes P3, P4, P5, and P6. One class was then randomly selected from this grade. In this way, there were 3 P6, 5 S3, 2 S6 classes chosen in the pilot schools, and 3 P6, 5 S3, 2 S6 classes chosen in the control schools, for a total of 5 pilot classes and 5 control classes. This was the same sampling method used in the baseline survey.

a) Control Schools

District	Sector	School	Type	Threat level
Nyamagabe	Nkomane	G.S Bitandara	P6,S3	Low fire
Karongi	Rangiro	G.S Rangiro	S3,S6	Medium poaching
Nyamasheke	Rangiro	G.S Mpabe	P6,S3	Medium poaching
Rusizi	Nyakabuye	G.S Nyakabwende	P6,S3	No fire, no poaching
Nyaruguru	Karengera	CIM-APPECUM	S3,S6	High poaching, low fire

[4] S6 Level Schools
[5] S6 Level schools

b) Experimental Schools

District	Sector	School	Type	Threat level
Nyamagabe	Kitabi	G.S Kitabi	P6,S3	High fire, Low poaching
Karongi	Twumba	G.S Gisovu	S3,S6	Low poaching, High fire
Nyamasheke	Bushekeri	G.S Gisakura	P6,S3	Medium poaching
Rusizi	Nyakabuye	G.S Nyamubembe	P6,S3	No fire, no poaching
Nyaruguru	Muganza	G.S Bigugu	S3,S6	High poaching, medium fire

From each class, 10 students (5 boys and 5 girls) were randomly chosen to participate in the survey. Interviewers looked at the class register and starting with the fifth student chose every third student until 10 students were chosen. If a chosen student was absent, the next 3rd student was chosen. If interviewers got to the bottom of the list, and ten students had not been chosen yet, they returned to the top of the list and continued counting three students. In this way, student #5, 8, 11, 14, 17, 20, 23, 26, 29 and 32 on the register were chosen for the survey. If 5 of one gender were already chosen, the interviewer continued choosing only the other gender. Students met with the team of interviewers and participated in a group session. Each student had an answer sheet to record his/her responses. The interviewers went through the survey instrument question by question with the students, and the students recorded their responses.

2.2.2 Community Survey

For the survey of out of school respondents, only sectors[6] adjacent to Nyungwe National Park were considered for the survey. Selection of survey sectors was based on firstly, levels and combinations of threats (fire and poaching) identified from Ranger Based Monitoring (RBM), and secondly, the cells being adjacent to the national park or not. Based on the sample size calculated (390 surveys overall), 13 out of 23 sectors abutting the park were chosen for the survey. The table below shows the combination of threats in the sectors and the sectors that were chosen for the community survey.

[6] A sector is

		Poaching Level			
		High	Medium	Low	None/Very Low
Fire Level	High	Uwinkingi Kitabi Kivu× Bweyeye×			
	Medium				
	Low		Rangiro×	Mahembe Twumba× Mutuntu Nkomane×	
	None/Very Low	Ruharambuga× Bushekeri×	Ruheru× Nyabimata Muganza Karambi× Cyato	Butare× Gatare Buruhukiro×	Gitambi Nyakabuye Nkungu× Karengera×

To choose the survey cells, we looked at the adjacent and non-adjacent cells to the park in each selected sector and chose one from each category randomly. Sometimes all cells bordered the park and two cells adjacent to the park were chosen. In total, 26 cells were chosen for the survey.

A household survey, achieved by interviewing people in their homes, was used to collect the data. In each cell, 15 households were surveyed for a total of 390 households for the whole survey. In order to choose which household to survey, enumerators started at the boundary of the cell and chose a direction (North, South, East or west) using a compass. After directing the compass, enumerators walked in the chosen direction for 500m (estimated) and interviewed the nearest household. After conducting the first survey, the enumerator walked another 500m in the same direction and surveyed again the nearest household. The enumerators continued with the same method until 15 surveys were completed in each cell.

If no house is located near the 500 m mark, the enumerators kept walking until the next house was found. If no one was found at home, the enumerator kept walking in the same direction until the next house with an adult to interview was found. If the enumerator got to the border of the cell or could not keep walking because of an obstacle, they changed the direction until the next household. Each enumerator interviewed one person per household. Enumerators considered the gender and age group of the respondents in order to meet the quota for the categories of respondents required for data sample.

3. KEY RESULTS FROM THE COMMUNITY SURVEY [7]

3.1 Demographics

The respondents interviewed during the Pre (N=390) and Post (N=390) implementation surveys were equally representing the 13 selected sectors (Bweyeye, Bushekeri, Twumba, Butare, Rangiro, Kivu, Nkomane, Karengera , Karambi, Nkungu, Buruhukiro, Ruheru, Ruharambuga), representing fairly evenly males and females, aged between 14 to 88, the majority of which (84% in Pre and 86% in Post) identified themselves as farmers with relatively low education levels (over 80% without any secondary school education).

Literacy/numeracy was measured by self-reports of ability to read in Kinyarwanda, write in Kinyarwanda, and do arithmetic (addition, subtraction, multiplication and division), with an average of 30% of respondents (in both Pre and Post survey) reporting to be unable to read, write and do arithmetic). In the Rwanda census, literacy levels are also self-reported.

3.2 Basic knowledge, values, and attitudes about NNP

The education/outreach strategy had various Knowledge-Attitude Targets (or KATs) about specific information the audience should know, or attitudes that would support the overall conservation goals, objectives, and behavior targets. For the Knowledge-Attitude target (KAT) about values, the knowledge baseline and indicator was % of audience that know the values of NNP. This included intrinsic value of NNP, and utilitarian values such as tourism, hydrological services provided by NNP and carbon sequestration services provided by NNP. Overall, communities around NNP have a general good knowledge of the park (with 92% and 95% in pre and post survey respectively being aware that Nyungwe is a park) and agree that it should be protected (96% and 99% in pre and post survey respectively). Interestingly, post implementation of education activities, 90% of respondents believed that NNP provide benefits to surrounding communities, as opposed to 72% in the Pre implementation survey, identifying among the benefits rainwater, fresh air, tourism income and employment among others. Also the knowledge of the main threats was already high before implementation, but some increases in specific knowledge were identified (see below and Annex I for the answers to each question).

3.2.1 Basic Attitude

From the education/outreach strategy, the attitude baseline and indicator was % of audience that agree that NNP should be protected because it is home to intrinsically valuable animals and because it provides benefits to them and their community and it is their responsibility to help protect NNP. The value for this indicator was already high in the baseline (Pre=96%) and increased to 99% of the interviewed in the Post survey, agreeing that NNP should be protected, that it is their responsibility to support park staff in the protection of NNP (Pre=96%, Post=95%). Moreover, Post implementation of education activities, 90% of respondents believed that NNP provide benefits to surrounding communities, as opposed to 72% in the Pre implementation survey, identifying among the benefits rainwater, fresh air, tourism income and employment among others.

a) **Threats to NNP**

The top three threats identified during the education/outreach strategy workshops for NNP are poaching, setting fire, and cutting bamboo.

The education/outreach strategy for each threat is described, followed by survey questions and results about behavior targets, knowledge targets, attitude targets, alternatives to the threat, and laws about the threat.

[7] see Annex I for detailed results for each session

1. Poaching

a. Poaching Behavior

For poaching, the education/outreach strategy target audience is poachers, those people who hunt illegally. It outlines the target behavior as "stop or reduce poaching". For this survey, we used self-reported measures of poaching behavior and questions about people in general. This will be supplemented with ranger data on encounters with snares or ranger data on encounters with carcasses.

During both Pre and Post implementation surveys, the levels of self-reported hunting behavior were very low (Pre= 1.1 % and Post= 0.8%), despite respondents showed to be aware that "people" do hunt in NNP (Pre= 19.6%, Post= 32%).

As is typical with self-reported illegal behavior, the level of hunting reported is extremely low, and much lower than the perception of people in general hunting. This suggests there is some level of hunting in NNP, and people are aware of that. It is troubling to note that the percentage of respondents that answered positively to the question "Do people hunt in NNP?" went up from about 20% to about 32%.Data from the Ranger-Based Monitoring of threats and illegal activities inside the park, carried out by the park rangers, show indeed an increase in illegal activities in the park between 2009 and 2014, indicating that the respondents' perceptions may reflect the reality..

b. Influencing poaching behavior

As well as looking at the direct audience of poachers and poaching, influencing audiences, those whose behaviors may affect the behavior of the direct audiences, are a target audience of the education/outreach strategy. This includes: family and friends, women's groups, school children, local authorities such as police, park rangers, and military, community leaders such as teachers, pastors, presidents of cooperatives or associations, NGO leaders and community decision makers. These groups have personal relationships or are in a position of influence, and can affect the attitudes and behavior of poachers. The target behavior identified was "encourage others to stop poaching", whether referring to husbands, sons, other relatives, neighbors, friends, suspected or known poachers. In the education/outreach strategy, the indicator is % of people who have encouraged others to stop poaching. The survey questions focused on starting a conversation with someone. From the results we see that some conversations were happening before the education and outreach activities about encouraging others to stop hunting or seeking alternatives to hunting. However, these conversations showed a 6% increase in the post outreach surveys.

c. Attitudes toward hunting

According to the education/outreach strategy, the attitude target and indicator is % of people who agree that it is desirable and possible to stop poaching animals. Although poachers are specifically targeted in the strategy, the sample in the survey is too small to report on. Another attitude baseline and indicator is the % of audience that agree that poaching is an undesirable activity because it has a negative impact on wildlife and people and it is their responsibility to help stop poaching. The % of respondents agreeing that hunting should not be allowed (81%) and that it is their responsibility to support park authorities in their efforts to stop hunting in NNP (90%) was high already in the Pre survey and increased in the Post survey (85% and 95% respectively).

d. Knowledge about hunting impact

In the education/outreach strategy, the percentage of audience that knows the impact of poaching on wildlife and people was the knowledge indicator. The % of respondents who understood hunting is problematic for animals increased from 74% to 92% after the education and outreach activities. Specifically, those who answered, "Animal populations decrease because of hunting" went up from 67% to 88% and those who answered, "animal behavior is affected because of hunting" increased from 8% to 26%.

The % of respondents recognizing hunting as a problem for people living in communities surrounding NNP was similar (80%) before and after implementation. Interestingly, when asked how hunting is a problem for people living in communities surrounding NNP, the % of respondents answering that

"Hunting decreases animals for tourism which brings revenue for communities" increased from 46% to 76% after the outreach efforts, with a 10% in the Post survey who answered that "Hunting is a problem for people living in the communities due to the "punishment for poachers.

In the baseline survey the answer that hunting decreases food supply for people was cited by 23% of respondents, although hunting is not allowed in NNP for any reason, including food for people. It is important to note that this answer was given by 0% of respondents in the survey taken after the education and outreach activities.

e. Alternatives to Poaching

In the education/outreach strategy, another knowledge-attitude target (KAT) focused on alternatives. The knowledge baseline and indicator was % of audience that knows about the realistic alternatives to poaching. The attitude baseline and indicator was % of audience who agree that there are alternatives to poaching. These issues were addressed by survey questions, reporting 80% of respondents in Pre and 85% in Post education implementation answering there are alternative ways to get meat.

2. Setting fires

a. Fire Setting Behavior

For setting fire, the education/outreach strategy target audience included honey collectors, charcoal makers, truck drivers (who smoke or set fires in the forest to keep warm or cook as they are travelling on the road through NNP), and farmers who use fire to clear their fields. The education/outreach strategy outlines the target behavior as "stop setting fires", whether for collecting honey, making charcoal, cooking, keeping warm, or clearing land.

For the survey, we used self-reported measures of fire-setting behavior and questions about people in general. As is typical with self-reported illegal behavior, the level of setting fires is extremely low (see Annex X). It is interesting to note that in the baseline survey 10% of respondents reported using fire themselves in the last 5 years and in the post education and outreach survey 0% of respondents reported using fire themselves in the past 3 years. This will be discussed in the light of the ranger data on fires.

b. Influencing fire setting behavior

As well as looking at the direct audiences that are setting the fires, the education/outreach strategy examined influencing audiences, the same groups associated with poachers. These groups have personal relationships or are in a position of influence, and can affect the attitudes and behavior of the people setting fires. The target behavior identified was "encourage others to stop setting fires in NNP". In the education/outreach strategy, the indicator is % of people who have encouraged others to setting fires. The survey questions focused on starting a conversation with someone.

Some conversations are happening about this topic (to encourage others to stop setting fires, stop clearing land and find alternatives). Overall, there was a slight increase in percent of respondents who indicated starting a conversation about this topic in the post education and outreach survey, with the largest increase being a jump from 34% of respondents to 43% of respondents who indicated they had started a conversation with someone to encourage them to stop setting fires in NNP.

c. Attitudes toward setting fires in/near NNP

According to the education/outreach strategy, the attitude target and indicator is % of people who agree that it is desirable and possible to stop setting fires in NNP. Although honey collectors, truckers, and charcoal makers are specifically targeted in the strategy, the sample in the survey is too small to report on. Another attitude baseline and indicator is the % of audience that agree that setting fires is an undesirable activity because it has a negative impact on wildlife and people and it is their responsibility to help stop setting fires.

The percentage of respondents that had the attitude that fires should not be set in NNP increased 10% to about 92% of respondents after the outreach activities. This is a very high level and should continue to be supported. In addition, a high percentage of respondents continues to agree that it is their responsibility to work with park authorities to help stop this behavior.

d. Knowledge about impact of fire

In the education/outreach strategy, the percentage of audience that knows the impact of setting fire on wildlife and people was the knowledge target. The majority of people surveyed (90% in Pre and 99% in Post) understood that setting fires is problematic for both animals/ plants and local communities (89% in Pre and 93% in Post), quoting as reasons that animals and plants are killed by fire and that local people commit time to fighting fires, which could be used for other activities (67% in Pre and 39% in Post).

e. Alternatives to setting fires

The education/outreach strategy described a knowledge-attitude target (KAT) focusing on alternatives to setting fires. The knowledge baseline and indicator was % of audience that knows about the realistic alternatives to setting fires. The attitude baseline and indicator was % of audience who agree that the alternatives to setting fires are preferable and it is possible / realistic for them to choose the alternatives. Although different sub-audiences set fire, only honey collectors were addressed by the Pre and Post surveys, which found over 90% of respondents agreeing there can be alternative ways to harvesting honey in the forest, quoting managing private hives outside the park.

3. Cutting bamboo

a. Cutting Bamboo Behavior

For cutting bamboo, the education/outreach strategy outlines the target behavior as "stop cutting bamboo", whether for construction, crafts, or firewood. For this baseline, we used self-reported measures of fire-setting behavior and questions about people in general. While no respondent reported collecting bamboo in the park, 9% and 13% of respondents in Pre and Post survey recognized people still cut bamboo, mostly to make baskets and other materials.

b. Influencing bamboo cutting behavior

As well as looking at the direct audience of bamboo cutters, the education/outreach strategy examined influencing audiences, the same groups associated with poachers. These groups have personal relationships or are in a position of influence, and can affect the attitudes and behavior of the people cutting bamboo. The target behavior identified was "encourage others to stop cutting bamboo in NNP". In the education/outreach strategy, the indicator is % of people who have encouraged others to stop cutting bamboo. The survey questions focused on starting a conversation with someone to encourage them to stop setting fires in NNP, and someone starting a conversation with them.

Some conversations are happening about this topic (to encourage others to stop cutting bamboo, and finding alternatives). Overall, there was over a 10% increase in percent of respondents who indicated starting a conversation about this topic.

c. Attitudes toward cutting bamboo in NNP

According to the education/outreach strategy, the attitude target and indicator is % of people who agree that it is desirable and possible to stop cutting bamboo in NNP. Another attitude baseline and indicator is the % of audience that agree that cutting bamboo is an undesirable activity because it has a negative impact on wildlife and people and it is their responsibility to help stop cutting bamboo. From the results, it emerges that cutting bamboo is not seen as big a threat to NNP as poaching and setting fires. 82% of respondents in the Pre survey thought people should be allowed to cut bamboo in NNP, although there was a slight decrease in the Post survey (75%).

d. Knowledge about impact of cutting bamboo

In the education/outreach strategy, the percentage of audience that knows the impact of cutting bamboo on wildlife and people was the knowledge target. During the implementation of outreach activities, there was not an improvement in this knowledge, given that only 50% of the respondents in both survey knew there were some animals particularly affected by bamboo cutting, and that very few of those knew it related to the owl-faced monkey.

e. Alternatives to Cutting Bamboo

In the education/outreach strategy, another knowledge-attitude target (KAT) focused on alternatives. The knowledge baseline and indicator was % of audience that knows about the realistic alternatives to bamboo cutting. The attitude baseline and indicator was % of audience who agree that the alternatives to bamboo cutting are preferable and it is possible / realistic for them to choose the alternatives.73% of respondents of both surveys agreed that there are alternative places for people to get bamboo other than the park. Interestingly, there was a large increase in the percent of respondents who replied that planting bamboo in their fields was an alternative place for people to get bamboo. 91% of respondents listed planting as an alternative post outreach activities, while 46% listed it as an option pre outreach activities. It is also interesting that only 7% listed buying bamboo as an option post outreach, while 47% listed it pre outreach.

4. DISCUSSION: COMMUNITY OUTREACH SURVEY RESULTS

When developing materials for the community outreach activities, such as the community events and the radio program, low levels of literacy/illiteracy reported were taken in consideration. The surveys were designed to address the below questions:

- Do community members in the areas in which education and outreach activities were implemented know more about, and exhibit more positive attitudes and behaviours towards the conservation of NNP than those in areas where no education and outreach activities were implemented?
- Do individuals who participated or were exposed to education and outreach interventions of the project express more support for conservation of NNP than those who did not participate?

Unfortunately, survey data as collected makes it difficult to compare the populations and areas exposed to outreach activities against those populations and areas not-exposed, in order to address these points directly. The results do allow us to re-focus the questions and address issues relating to whether community members had any significant level of exposure to the WCS implemented outreach activities, if individuals who had exposure to the activities/materials were made aware of the messages being presented, and if the level of awareness/support towards conservation of NNP changed within community members following the implementation of the outreach activities, for those exposed. Consideration must be made that the time, the resources and thus our ability to reach out to a significant proportion of the community was limited.

It is encouraging that such a high percentage, 99%, of community participants agree that NNP should be protected and 95% believe it is their responsibility to support park staff. This indicates that the community participants would likely be receptive to learning more about NNP and participating in efforts, along with park staff, to support the park. Especially since 90% believe that NNP provides benefits to the communities. Future activity design should continue to emphasize the benefits of NNP, to encourage community members to participate in efforts to protect NNP.

4.1 Threats to NNP

4.1.1. Poaching

As is typical with self-reported illegal behavior, the level of hunting reported is extremely low, and much lower than the perception people have of hunting in general. This suggests there is some level of hunting in NNP, and people are aware of that. It is interesting to note that the percentage of respondents that answered positively to the question “Do people hunt in NNP?” went up from about 20% to about 32%. Data from the Ranger-Based Monitoring of threats and illegal activities inside the park, carried out by the park rangers, show indeed an increase in illegal activities in the park between 2009 and 2014, indicating that the respondents’ perceptions may reflect the reality. Further investigation is needed to address the target behavior, “stop or reduce poaching”, but the survey responses data indicate that this is unlikely.

There was a 6% increase in conversations started that encouraged another person to stop poaching. While modest, this does positively reflect the target behavior to “encourage others to stop poaching”.

Since sharing opinions and knowledge with others has a multiplier effect, it would be good to emphasize in future activities ways that people can start conversations with others. Many people like to see themselves as positive role models or as an influence for positive change, perhaps this could be tied into the responsibility community participants feel to support park authorities discussed below.

In terms of attitudes toward hunting, the percentage of respondents remained high who agree that poaching is undesirable and they have a responsibility to help stop poaching. Again here, the high level of responsibility felt by the community to support park authorities is very encouraging. This indicates good relations between the community and the park authorities which could have a positive impact on the adoptions of protective behaviours, should the community gains more knowledge about protective actions they can take when these actions are presented by park authorities.

The % of respondents who understood hunting is problematic for animals increased from 74% to 92% after the education and outreach activities. Specifically, those who answered, "Animal populations decrease because of hunting" went up from 67% to 88% and those who answered, "animal behavior is affected because of hunting" increased from 8% to 26%. This could be a reflection of an emphasis in the education and outreach materials designed, including the "threat posters" (on poaching, fire and bamboo cutting), and the radio program which had several episodes focusing on poaching.

The post survey results showed 10% of respondents felt that hunting was a problem for people living in communities due to "punishment for poachers". The punishment of a poacher affects the whole family because of incomes the family was expecting from the man in family, expenses related to fines and other costs when in jail. There was also a 30% increase in the percentage of respondents that recognized the damage that hunting can cause for tourism revenue. This can be emphasized in future outreach efforts to better illuminate how the park benefits communities when its resources are protected. There was a dramatic drop from 23% to 0%, pre and post outreach efforts, of respondents who answered that hunting decreases food supply, possibly indicating less reliance on hunted animals or increased knowledge of the illegal nature of the product (thus concealment of its consumption).

4.1.2 Fires

In the baseline survey 10% of respondents reported using fire themselves in the last 5 years and in the post education and outreach survey 0% of respondents reported using fire themselves in the past 3 years.

As with poaching, there was a slight increase in the percentage of respondents who indicated they had started a conversation to encourage someone to stop setting fires in NNP. A very high level of respondents post outreach believe that fires should not be set in NNP, the increase was striking, jumping from 10% to 92%. This positive attitude should continue to be supported in future outreach efforts and efforts should be made to tie into the high support level indicated for working with park authorities to stop fire setting behaviors. An attitude change in this case is quite clear and encouraging for future efforts.

Knowledge levels regarding the impact of fire remain high. The knowledge target was achieved as shown by an increase of almost 10% to 99% in understanding that setting fires is problematic for both animals/plant, and over 10% to 93% understanding is it problematic for communities as well, in the post outreach survey. Positive knowledge was shown about alternatives to setting fire as well. The response from honey collectors regarding alternative methods to setting fires within NNP were positive and hit the knowledge targets with 90% of honey collectors agreeing that there were other ways to harvest honey and quoting managing private hives outside of the park as an alternative. Responses from other sub-audiences who might set fires such as charcoal makers, truck drivers and farmers were not collected. Future surveys could target these sub-audiences to gain more information about fire setting behavior in order to design appropriate outreach materials and activities to reach these audiences.

4.1.3 Bamboo

For cutting bamboo, the education/outreach strategy outlines the target behavior as "stop cutting bamboo", whether for construction, crafts, or firewood. For this baseline, we used self-reported measures of fire-setting behavior and questions about people in general. While no respondent reported collecting bamboo in the park, 9% and 13% of respondents in Pre and Post survey recognized people still cut bamboo, mostly to make baskets and other materials.

The target behavior identified regarding bamboo influencing audiences was "encourage others to stop cutting bamboo in NNP". There was a 10% increase overall in conversation starting relating to bamboo which is a good start and should be expanded upon.

The survey responses, both pre and post outreach, indicated that the majority of people do not believe that cutting bamboo is as big a threat to NNP as poaching and setting fires. In fact, a majority think that people should be allowed to cut bamboo in NNP, although the percentage declined by 7%. In addition, only 50% knew that some animals were affected by bamboo cutting. Necessary next steps involve activities to heighten awareness in the community about the damage of bamboo cutting. In general there is a high sense of responsibility to help park authorities and also a belief that NNP provides benefits to the community, these attitudes and beliefs should be tied in with concrete actions to make lasting change.

73% of respondents of both surveys agreed that there are alternative places for people to get bamboo other than the park. Interestingly, there was a large increase in the percent of respondents who replied that planting bamboo in their fields was an alternative place for people to get bamboo. 91% of respondents listed planting as an alternative post outreach activities, while 46% listed it as an option pre outreach activities. It is also interesting that only 7% listed buying bamboo as an option post outreach, while 47% listed it pre outreach. The education materials we produced under this project focused on bamboo cutting. Included were poster design with messages about the impact of bamboo cutting on animals and people; possible alternatives to NNP bamboo cutting; and a board game that illustrated that it is unlawful to cut bamboo from Nyungwe. There were some trainings in use of these materials, as well as schools visits that focused on this theme. No alternative sources of bamboo were provided by WCS. With support of Margot Marsh Biodiversity foundation grant, we also conducted meetings with community and local authorities in bamboos zones and we did environmental education in schools around bamboo zone**.**

5. KEY RESULTS FROM THE SCHOOL SURVEY [8]

5.1 Demographics

Student ages ranged from 14 to 24, 50% girls and boys, 30% were Primary 4-6 students, 45% Secondary 1-3 students, and 25% Secondary 4-6 students.

5.2 Animal knowledge

5.2.1 Animals living in Nyungwe

Students generally correctly stated that blue touraco, baboon, colobus monkey, Owlfaced monkey and L'hoesti monkey are found in Nyungwe. In the Post implementation survey, 57% of the students correctly stated that chimpanzees live in Nyungwe, as opposed to 38% in the Pre survey.

5.2.2 Names of animals

Animals found in Nyungwe were correctly identified by 0 to 25% of respondents (depending on species). Significantly more students could name baboon, Colobus monkey, and chimpanzee post-campaign. Chimpanzees were named correctly by 36% of respondents, compared with 25% of respondents in the pre-implementation survey. Pilot schools showed significant increases in naming baboon, Colobus monkey, giraffe, chimpanzee and elephant comparing before and after working with them.

[8] see Annex II for detailed results for each session

5.3 Attitude Questions

In general, the students around Nyungwe have a positive attitude towards the park, answering it should be protected in the great majority of cases (98% of respondents, Pre and Post implementation of activities). In the Post survey, 84% said Nyungwe would NOT be better used as farmland (compared with 73% pre-campaign) and 89% of students in the pilot schools said Nyungwe would NOT be better used as farmland, significantly greater than 71% in the control group.

5.4 Behaviour Questions

For the most part, students indicated low levels of participation in threat behaviours to Nyungwe (cutting bamboo, setting fires, and hunting) in both pre and post survey and both in pilot and control groups. Students encouraged family members not to do actions which may transmit diseases to chimpanzees, with 17% saying "a lot like me" for "Some children encourage their family or friends not to spit, litter or use the bush toilet in pilot schools as opposed to 6% in the pre-implementation .

5.5 Environmental clubs and awareness of education/outreach efforts

In addition to the questions that were asked both before and after the work with the pilot students, some questions were asked about environmental clubs and student awareness of the education/outreach efforts afterwards.

- Overall, 52% of students surveyed were members of their school's environmental club. This was similar in pilot and control schools
- Those who were members listed "learn about Nyungwe conservation" (62%) and "educating communities" (53%) as the main activities, with "planting trees" (18%) as the next one. Other answers included "learn about environmental protection" (11%) or Nyungwe specific activities such as songs, dramas, or debates about Nyungwe (1-3%), but these were very low. It is unclear if those who put "learn about Nyungwe conservation" learned the information through some type of creative activity.

For those students who were not members of their school's environmental club, 56% said they have attended activities organized by the school environmental club.

We asked whether students had ever used the education materials about NNP at school.

- 77% of students overall responded that they had, with posters, books, films and dramas as the main materials.
- 86% of pilot school students, compared with 68% of control school students (significantly more) said they used education materials about NNP
- Books and posters were considered to have the most information about NNP
- The top 4 materials were their favorite materials as well

5.6 Questions on students' role

To see whether students felt Nyungwe conservation is a long-lasting, important issue, and whether they have a role in teaching about Nyungwe conservation in the future, we asked "If you have a family in the future, do you think your children will learn about Nyungwe Forest at home and at school, or only at school?"

- 95% said "at home and at school"

Have you done anything to protect Nyungwe Forest?

- 69% said "yes"
- This compares with 44% of students who said "yes" in the pre-survey
- 77% in pilot schools said "yes" they have done something to protect Nyungwe, significantly more than the 60% in the control schools

The main thing that students did was educating others about Nyungwe and encouraging them not to do threat behaviors such as cutting trees or burning the forest, and not doing these behaviours themselves.

6 DISCUSSION: COMMUNITY OUTREACH AND SCHOOL SURVEY RESULTS

The survey findings show that the level of basic information about animals, starting with their names, is still low for students, and should continue to be part of education/outreach efforts. Animals that are better known (but not found in Nyungwe) such as gorillas and giraffes, were easier for the students to identify. In order to build pride in Nyungwe animals, students should continue to learn about Nyungwe species, with chimpanzees as a special focus. In future surveys, perhaps photos rather than drawings, which were used here, would give a more realistic image for students to respond to.

For knowledge concerning chimpanzees, percentages were similar to the baseline. There is room for improvement, and this should be emphasized in the education/outreach materials and activities implemented.

Results show that student attitude towards Nyungwe is very positive. This should be continued to be emphasized, as well as making students' sense of personal responsibility towards Nyungwe and positive actions even greater.

More students whom we worked with (compared with students in control schools) saw the link between unhygienic behavior such as vomiting or using the bush toilet and transmitting human diseases to chimpanzees. Not doing these behaviors and encouraging family members to do the same is still a message that students should learn.

Environmental clubs, since they have more flexibility in their content, should be an important source of Nyungwe-focused activities. Clubs should continue and increase their emphasis on Nyungwe conservation and outreach.

The materials developed for this project are being implemented in the schools and students are able to recall using them. Follow-up with pilot schools confirm the use of materials. Many students in control schools also learn about NNP. Based on student preference, the most useful materials to develop and use are posters, books, films and dramas. This should be continued in the future, with Nyungwe and other topics. We can see that working with students increases their level of action toward Nyungwe conservation; this should be continued/ increased. Student action and commitment to NNP today can translate to continued support and pro-conservation action as students grow up.

Overall, students showed a high level of understanding of Nyungwe as a national park and the rules of the park. Student attitude towards Nyungwe is very positive. The strong belief that Nyungwe is valuable and better as a park than farmland is helpful for students' stand against future degazettement. Most students feel some responsibility towards Nyungwe. Few students do illegal behaviors such as hunting and setting fires, with 69% (overall; 77% in pilot schools) saying they have done something to protect NNP. This should be continued to be encouraged, while adding ideas about conservation action beyond telling others about NNP and appropriate behaviors.

Basic information about chimpanzees and how special they are (found only in Africa in the wild, Nyungwe is the only Rwandan park with chimpanzees), and that human diseases can make chimpanzees sick, should be continued to be emphasized in education/outreach programs. Increasing pride and knowledge in Nyungwe wildlife will be helpful for supporting its conservation. Chimpanzees, with their important ecological and economic role through tourism, are especially important.

Environmental clubs, since they have more flexibility in their content, should be an important source of Nyungwe-focused activities. Clubs should continue and increase their emphasis on Nyungwe conservation and outreach, and schools without environmental clubs could be encouraged to start one, perhaps with the help of schools that have environmental clubs. Materials and activities should continue to be developed for clubs, taking into account that this study found that posters, films, books and dramas were said to be the most useful and enjoyable ways to get information.

Overall, the positive attitude towards the park and helping conserve it was high across students surveyed. Students in both pilot schools, where we worked, and the control schools, knew or could infer about illegal behaviors. These messages are transmitted to the students through our formal program efforts, but also more broadly.

In the post-implementation survey, pilot school students showed greater familiarity with the Nyungwe education materials, specific information about Nyungwe species such as their names, had a greater sense of responsibility and were more likely to have done something to conserve Nyungwe than their control school counterparts. Beyond this project, the positive gains from working with students should be continued and expanded to other schools. Depending on funding, creative methods such as using community volunteers and partners should be considered. For example, what key activities might RDB take on for school education programming?

6.1 Knowledge of and attitude to laws

The education/outreach strategy addressed laws and punishments related to the threat behaviors of poaching, setting fires, and cutting bamboo. The knowledge baseline and indicator were % of audience that know the laws, regulations and punishments relating to the threat behaviors and % of audience that know the likelihood of getting caught if committing unlawful threat behaviors in NNP.

The respondents' knowledge on the law and regulations varied for different threats. While people know that hunting is illegal in NNP (94% in Pre and 97% in post), and that there can be fines and imprisonment for carrying out illegal activities, only 54% of the respondents of the Pre survey knows that setting fires is illegal (and 79% in Post).

The knowledge baseline and indicator were % of audience that know the laws, regulations and punishments relating to the threat behaviors and % of audience that know the likelihood of getting caught if committing unlawful threat behaviors in NNP. The respondents' knowledge on the law, regulations and punishments varied for different threats. This indicates that more work is needed to raise awareness about these issues. Other questions in the survey indicate a high level in the sense of responsibility to support park authorities, therefore there is reason to be hopeful that once the community's awareness of laws, regulations and punishments is raised, that they will support the park in upholding and maintaining the regulations and laws.

6.2 Post survey Media questions

The baseline survey was designed with a media preferences section to find out community preferences. Based on the results it was decided that in implementing the education/outreach strategy, we would need to make use of different media to disseminate information and engage with different audiences. A number of important media-related baselines were established that assisted with developing effective ways to communicate with target audiences.

In the baseline, pre-outreach survey, it was found that radio provides the best method of reaching the largest number of people. It was found that about 61% of respondents surveyed used radio, while only about 28% used mobile phones and less than 2% used television.

The survey found that in terms of radio preference: 42.3% liked this source and 32.5% mostly prefer this source; while 47% listened to Radio 7days/week. The preferred radio station was found to be Rwanda Radio at about 91%.

With regard to newspapers, it was found that most people do not have regular access to printed media such as newspapers. Of those that do have access, the preferred newspaper is Imvaho which was rated as the #1 preference for about 78% of respondents.

The baseline survey found there is a broad interest in different forms of music with gospel and religious music being the most preferred, closely followed by traditional music.

In terms of community activities, the baseline survey found that most respondents said that they enjoyed attending community meetings. Cultural dancing is also popular and to a lesser extent drama and plays. It was suggested that there had been limited exposure to the latter, perhaps explaining the lower level of preference expressed.

From the information of the baseline survey on media used, the project developed targeted activities (such as socio-marketing events, community meetings, a radio program, some visual materials etc.). During the 2014 survey we attempted to measure the reach of education and outreach interventions, specifically of the radio program, the ANICO program, the community events (socio-marketing, forums, other community meetings and school-led activities for the community) and the materials developed, providing a new baseline for defining the scale that future activities should have in order to secure adequate reach.

From the 2014 survey it was interesting that 50% of the respondents answered to have listened to a radio program on NNP, given that the only specific radio program on NNP was the one implemented by WCS for only 5 months in 2013. Most respondents (65%) identified at least some of the issues covered during the radio program (including NNP protection, mining, poaching, tree cutting, etc.).

For the ANICO program, only 8% of respondents correctly identified them as the volunteers who sensitize people about NNP, having met them mostly at community meetings.

24% of the interviewed had participated to a community sensitization event about NNP, with 49% retaining that the main messages were about NNP/environment protection.

18% of respondents attended community outreach events organized by students, with 55% retaining that the main messages were about NNP/environment protection. Among the respondents, 10% had students in their household who belong to environmental clubs and who in 90% of cases reported learning knowledge related to NNP.

21% of the respondents had noticed the posters in their village (posters provided to the ANICO to be places at the Cells' offices), with 85% identifying messages about NNP (animals which are in the park, protection of NNP, antipoaching etc.).

6.3 Effectiveness of Different Outreach Methods/Approaches

From the information of the baseline survey on media used, the project developed targeted activities (such as socio-marketing events, community meetings, a radio program, some visual materials etc.). During the 2014 survey we attempted to measure the reach of education and outreach interventions, specifically of the radio program, the ANICO program, the community events (socio-marketing, forums, other community meetings and school-led activities for the community) and the materials developed, providing a new baseline for defining the scale that future activities should have in order to secure adequate reach.

The radio program seemed to be particularly effective given the short time period it was on air, only 5 months. Despite this, 50% of respondents indicated they had listened to a radio program on NNP, with 65% able to identify some of the issues covered during the radio program.

Posters seemed to be an effective method of portraying information to the community. 85% of those who had seen the posters could identify messages about NNP portrayed. Only about 20% noticed the posters, so work needs to be done to make posters more visible and/or more plentiful to capitalize on their effectiveness in relaying messages.

7. CONCLUSIONS AND RECOMMENDATIONS

The purpose of the 2014 survey was to measure the impact of the investment in conservation education and outreach activities on the communities adjacent to NNP, in terms of changes in knowledge, attitudes and behaviours regarding the conservation of the park. Between 2013 and 2014 the interest in the scope of our interventions and other community conservation interventions has grown. In the 2011 baseline survey we explored only the knowledge, attitude and behavior of respondents in the study area. In the 2014 repeat survey, the scope was widened to measure the reach of education and outreach interventions, specifically how far messages and materials spread within the schools and communities where we worked.

Knowledge levels overall, between the student and community respondents surveyed indicate a need for improvement. The attitude in support of protection of NNP and support of park authorities is high

overall and this is very encouraging. Respondents also indicate that the community views the park as having positive benefits for the community. This indicates good relations between the community and the park. This positive attitude should continue to be supported in future education and outreach efforts. Efforts should be made to create programs designed to increase knowledge levels that to tie into the high support and level of responsibility indicated for working with park authorities.

One area in particular that needs to be addressed is bamboo cutting. Survey responses show that most people do not view bamboo cutting as a threat to NNP in the same way they view fires or poaching. Awareness needs to be raised about the problems associated with bamboo-cutting, tapping into the high support levels reported for park authorities.

Slight increases in conversation-starting related to poaching, fire setting and bamboo cutting were shown in the post survey. Since sharing opinions and knowledge with others has a multiplier effect, it would be good to emphasize in future activities or trainings, examples of ways that people can start conversations with others. Many people like to see themselves as positive role models or as an influence for positive change, perhaps this could also be tied into the responsibility community participants feel to support park authorities.

A focus should be put on future improvements in expanding the reach of media materials to a larger audience. The post survey shows, that those who did participate in some way with the media offerings, whether viewing posters, listening to radio programs or attending community events, retained knowledge about the messages presented to a positive degree. In addition, it would be beneficial to increase the number of environmental clubs, because while only 10% of community survey respondents reported having students in their household who belong to environmental clubs, 90% of these cases reported learning knowledge related to NNP! This shows that students involved in environmental clubs can be exceptionally effective as transferring knowledge and functioning as multiplier audiences within the community.

Overall, knowledge levels of those reached by education and outreach materials and activities still needs improvement. Encouragingly, there is a positive attitude of responsibility felt to support park authorities, effective multiplier audiences have been identified, media sources developed were shown to have positive effects in relaying messages when reached by community members, and there is a belief that NNP provides benefits to the community. These attitudes and beliefs should be tied in with concrete actions to increase knowledge and make lasting behavior change.

ANNEX I: Nyungwe National Park Community Survey: Pre & Post-implementation survey results

Demographics

Pre: Respondents were:

- 53% male, 47% female
- Equally representing 13 sectors: Bweyeye, Bushekeri, Twumba, Butare, Rangiro, Kivu, Nkomane, Karengera , Karambi, Nkungu, Buruhukiro, Ruheru, Ruharambuga
- Ages 14 to 88
- 86% self-identified as farmers. Others described themselves as business owners (3%), secondary school students (3%), retired (2%) and housewives (2%)
- 29% without any primary school, 35% with 6 years of primary school, and 89% without any secondary school.

Post: Respondents were:

- 51% male, 49% female
- Equally representing 13 sectors: Bweyeye, Bushekeri, Twumba, Butare, Rangiro, Kivu, Nkomane, Karengera , Karambi, Nkungu, Buruhukiro, Ruheru, Ruharambuga
- Ages 16 to 52 {Question 1}
- 84% self-identified as farmers. Others described themselves as students (10%), employees (2%), poter (1%). For the following, less than 1% in each category self identified as: business owner, hand craft, carpenter, handicap, mechanic, sheeper, and unemployed. {Question 5}
- 24% without any primary school, 34% with 6 years of primary school, and 84% without any secondary school. {Questions 2a and 2b}.

Pre: Respondents reported:

- Reading levels are: 24% high, 24% medium, 20% low, 32% unable to read.
- Writing levels are: 23% high, 24% medium, 20% low and 34% unable to write.
- Arithmetic levels are: 22% high, 24% medium, 25% low and 30% unable to do arithmetic.

Post: Respondent reported:

- Reading levels are: 16% high, 32% medium, 23% low, 29% unable to read.
- Writing levels are: 17% high, 31% medium, 21% low and 31% unable to write.
- Arithmetic levels are: 11% high, 34% medium, 31% low and 23% unable to do arithmetic.

Basic knowledge, values, and attitudes about NNP

<u>Basic Knowledge</u>

Did you know that Nyungwe Forest is a National Park?

- Pre: Yes = 92%, No= 1%, Don't know = 8%
- Post: Yes = 95%, No= 2%, Don't know = 3%

What activities that local people do in the forest might reduce or stop tourists going to NNP? Respondents gave their own answers:

- Pre: Poaching (62%), setting fires(52%), cutting trees (46%), cultivating/encroachment

(16%), mining (14%), honey collecting (10%), cutting bamboo (8%) and don't know (18%)
- Post: Poaching 53%, cutting trees 52%, setting fires 50%, mining 25%, cultivating/encroachment 24%, cutting bamboo (6%), honey collection 5%, and don't know 15%.

What activities that local people do in the forest might reduce the amount or quality of water flowing from NNP?
- Pre: Cutting trees (43%), setting fires (39%), mining (24%), cultivating/encroachment (22%), poaching (19%), cutting bamboo (4%), collecting honey (4%), don't know (19%).
- Post: cultivating/encroachment (33%), setting fires (33%), Cutting trees (31%), mining (25%), poaching (8%), cutting bamboo (2%), collecting honey (1%), don't know (24%).

What activities that local people do in the forest might reduce the ability of the forest to absorb carbon? The phrase "and help control global warming" at the end of this question was included in the pre survey but not post.
- Pre: Setting fires (53%), cutting trees (52%), poaching (17%), cultivating/encroachment (11%), mining (6%), cutting bamboo (6%), honey collecting (3%), don't know (22%).
- Post: Setting fires (41%), cutting trees (32%), cultivating/encroachment (6%), cutting bamboo (4%), poaching (3%), mining (2%), honey collecting (<1%), don't know (37%).

Which animals in NNP deserve special protection?
- Pre: Colobus monkey (41%), Chimpanzees (31%),monkeys in general (30%), L'hoest's monkey (27%), duikers (18%), leopard (15%) [although it is extinct in NNP now]], owl-faced monkey (14%), all animals (13%), rodents such as Gambian rats, brush-tailed porcupines and squirrels (12%)
- Post: Post: chimpanzee 36.5%, monkeys in general 27%, L'hoest's monkey 21%, all of them must be protected 20%, Angolan colobus 15%, duikers 11%, birds of prey 6.5%, wild pigs 6%, owl-faced monkey 3%, baboon 3%, rodents such as Gambian rats, brush-tailed porcupine and squirrel species 2%, gorillas 2%.

NNP is similar to many forest types found in Africa.
- Pre: Agree (22%), disagree (25%), don't know (53%). [Those who disagreed are correct]
- Post: Agree (24%), disagree (34%), don't know (41%). [Those who disagreed are correct]

NNP is home to a large variety of rare or endangered animals.
- Pre: Agree (46%), disagree (8%), don't know (46%) [Those who agreed are correct]
- Post: Agree (48%), disagree (14%), don't know (38%) [Those who agreed are correct]

Africa is the only place where chimpanzees are found in the wild {Question 31c}.
- Pre: Agree (23%), disagree (13%), don't know (65%) [Those who agreed are correct]
- Post: Agree (34%), disagree (20%), don't know (46%) [Those who agreed are correct]

Rwanda is the only African country where chimpanzees are found in the wild.
- Pre: Agree (21%), disagree (15%), don't know (64%) [Those who disagreed are correct]
- Post: Agree (35%), disagree (20%), don't know (45%) [Those who disagreed are correct]

In Rwanda, chimpanzees are only found in NNP.
- Pre: Agree (33%), disagree (17%), don't know (50%) [Those who agreed are correct]
- Post: Agree (44%), disagree (19%), don't know (37%) [Those who agreed are correct]

Colobus monkey groups are smaller in NNP than in other places..

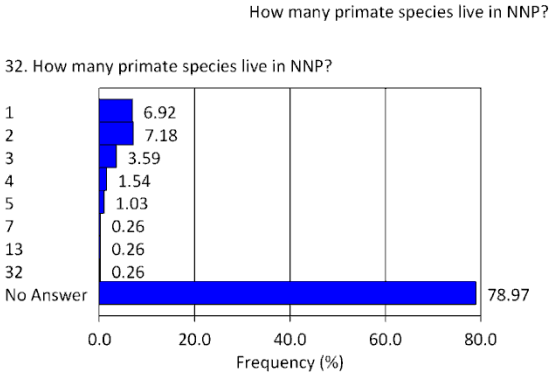
- Pre: Agree (9%), disagree (15%), don't know (76%) [Those who disagreed are correct]
- Post: Agree (22%), disagree (18%), don't know (60%) [Those who disagreed are correct]

Owl–faced monkeys are common in NNP.

- Pre: Agree (12%), disagree (12%), don't know (77%) [Those who disagreed are correct]
- Post: Agree (17%), disagree (14%), don't know (69%) [Those who disagreed are correct]

How many primate species live in NNP?

Pre:



- Post: Do not know 59%, do not know what primates are 14%. Less than 1% got the answer correct. [Correct answer is 13]

<u>Basic Attitude</u>

Do you agree that NNP should be protected?

- Pre: Yes = 96%, No = 1%, Don't know = 3%
- Post: Yes = 99%, No = <1%, Don't know = <1%

If yes, why do you believe it should be protected? (Respondents gave own answers)

- Pre: Answers included: It is home to animals that have a right to exist (intrinsic value) (69%); NNP provides benefits from tourism for communities living around NNP (tourism value)(48%); It is an important source of water for communities living around NNP (35%); It provides fresh (good) air (34%); It provides local climate regulation (28%); The forest absorbs carbon and helps reduce global warming (15%); It provides aesthetic / scenic / peaceful value (7%); It provides soil production services (4%); It provides soil production services (3%); and it provides education value (3%)

- Post: The main reasons cited for protection, if the respondent said yes, are: the forest as a source of rainwater (10%), the forest as a source of rain water and fresh air (9%), government resources (8%), as an animal habitat that attracts tourists (6%)

Do you agree that it is your responsibility to support park staff in the protection of NNP?

- Pre: Yes = 96%, no = 1%, don't know = 3%
- Post: Yes = 95%, no = 3%, don't know = 2%

In your opinion, does NNP provide benefits to surrounding communities?

- Pre: Yes = 72%, no = 5%, don't know = 23%
- Post: Yes = 90%, no = 7%, don't know = 3%

If yes, what are they? Respondents gave their own answers.

- Pre: Answers included: NNP provides benefits from tourism for communities living around NNP (tourism value) (64%); It is an important source of water for communities living around NNP (31%); It provides fresh (good) air (28%); It provides local climate regulation (25%); The forest absorbs carbon and helps reduce global warming (16%); It is home to animals that have a right to exist (intrinsic value) (14%) [Although this does not address the questions about benefits to communities]; It provides a home for pollinators which people need for their crops (8%); It provides soil production services (6%); It provides aesthetic / scenic / peaceful value (6%); It provides research value (5%); It provides education value (4%). 2% also said it provides jobs.

- Post: Answers included: rainwater and fresh air (17%), rain water (16%), benefits on country-level (7%), Tourism brings in income 5.5%, Tourism brings in income and provides rain water (5%); rain water for crops (5%); fresh air (3%), other listings included employment (2%), home for animals and different combinations of the above.

Are there any animals in NNP that are particularly important to you?

- Pre: Yes = 61%, no= 38%, don't know = 1%
- Post: Yes = 64%, no= 36%, don't know = <1%

If yes, which ones?

- Pre: L'hoest's monkey (31%), chimpanzees (30%), monkeys (in general) (23%), baboons (16%), colobus monkey (12%), duikers (7%), wild pigs (7%), rodents such as Gambian rats, brush-tailed porcupine and squirrel species (6%). Although it was not asked why people gave their responses, it is interesting to note that duikers, wild pigs, and rodents are species that are sometimes hunted. Other interesting answers included leopard (4%) although it no longer exists in the park, and gorilla (7%), which are not found in NNP. Bees and owl-faced monkeys were mentioned by 3% of respondents each.
- Post: Chimpanzee (39%), all animals (13%), baboon 10%, colobus 9%, L'hoesti monkeys 9%, gorilla 7%, blue monkey 4%, monkeys in general 5%, vervet monkey 3%, birds 2%, duiker 2%.

Threats to NNP

I. Poaching

a. Poaching Behavior

Levels of self reported hunting behavior:

- Pre: 1.1 % said they ever hunted animals in NNP in the past 5 years
- Post: 0.8% said they ever hunted animals in NNP in the past 3 years

Post: If yes, 80% duikers, 20% African brush tailed porcupine, Gambian rates

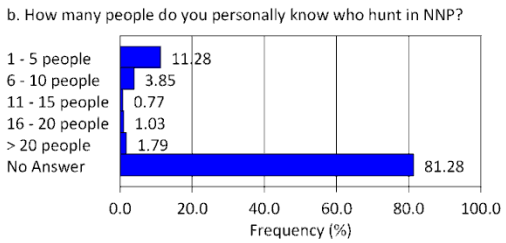
"Do people hunt in NNP?"

- Pre: Yes =19.6%, no= 42.1%, don't know = 38.2%
- Post: Yes =32%, no= 47%, don't know = 21%

If they said "yes", they were asked how many people they knew personally who hunt in NNP

- Pre:

Number of people known personally who hunt in NNP



- Post: None= 79%, 1-5 people= 14%, 6-10 people 4%, more than 20 people= 2%, 16-20 people 1%, 11-15 people <1%

Which animals do people hunt?

- Pre: duikers (38%), rodents such as Gambian rats, brush-tailed porcupines and squirrel species (35%), L'hoest's monkey (27%), and wild pigs (27%). Don't know = 20%.
- Post: rodents such as Gambian rats, brush-tailed porcupines and squirrel species (34%), duikers (33%), wild pigs (32%), L'hoest's monkey (8%), Angolan colobus (3%), monkeys in general (3%), baboon 2%, chimpanzees 2%, and Don't know = 35%.

b. Influencing poaching behavior

I have started a conversation with someone to encourage them to stop hunting in NNP:

- Pre: 28% of respondents
- Post: yes = 34%, no = 66%

I have started a conversation with someone about alternatives to hunting in NNP

- Pre: 25% of respondents
- Post: yes = 31%, no 69%

➢ From the results we see that some conversations were happening before the education and outreach activities about this topic. Conversations seem to have increased slightly, with the post outreach surveys showing a 6% increase in conversation starting.

c. Attitudes toward hunting

- Pre: 81% disagree that there should be some hunting allowed in NNP (agree = 10%, don't know = 9%)
- Post: 84.5% disagree that there should be some hunting allowed in NNP (agree = 11%, don't know = 4%)

- Pre: 90% agree that it is their responsibility to support park authorities in their efforts to stop hunting in NNP (disagree = 4%, don't know = 6%)
- Post: 95% agree that it is their responsibility to support park authorities in their efforts to stop hunting in NNP (disagree = 4%, don't know = 1%)

d. Knowledge about hunting impact

- Pre: 74% said yes that hunting is a problem for animals in NNP (no = 5%, don't know= 21%)
- Post: 92% said yes that hunting is a problem for animals in NNP (no = 6%, don't know= 1%)

If yes, how is it a problem for animals in NNP?

- Pre: Animal populations decrease because of hunting (67%), non-target species such as chimpanzees are caught (accidental snaring; 10%), animal behavior is affected because of hunting (8%) and don't know (9%)
- Post: Animal populations decrease because of hunting (88%), animal behavior is affected because of hunting (26%) non-target species such as chimpanzees are caught/accidental snaring (4%); migration of animals (2%); it is a loss for Rwanda (2%) and don't know (1%)

Is hunting a problem for people living in communities surrounding NNP:

- Pre: yes= 80%, no=6%, don't know = 14%
- Post: yes = 80%, no = 13%, don't know = 7%

If yes, how is it a problem for people living in communities surrounding NNP?

- Pre: The top answers were: Hunting decreases animals for tourism which brings revenue for communities (46%); hunting decreases food supply for people (23%).
- Post: The top answers were: Hunting decreases animals for tourism which brings revenue for communities (76%); Hunting is a problem for people living in the communities due to the "punishment for poachers" (10%)

"Are there any animals that once lived in NNP but don't live there anymore?"

- Pre: yes = 39%, yes, no = 7%, don't know = 55%
- Post: yes = 33%, no=17%, don't know = 50%

Specific animals subsequently named were:

- Pre: elephant (71%), buffalo (35%), leopard (8%) and lion (5%). Don't know = 8%. Lions as well as other animals were named incorrectly.
- Post: elephant (64%), buffalo 27%, leopard 8%, lion 3%, do not know 23%

e. Alternatives to Poaching

Do people who hunt animals in NNP hunt for meat or money or both (remember you can say 'I don't know')

- Pre: Both = 58%, meat = 22%, money = 2%, don't know = 17%
- Post: Both = 60%, meat = 27%, money = 5%, don't know = 13%

If people hunt for meat, are there alternatives ways for them to get meat?

- Pre: Buy meat (24%), raise pigs (20%), raise rabbits/guinea pigs (20%), raise goats (16%), don't know (14%)
- Post: Yes = 85%, no = 8%, do not know = 6%

Post: If yes, alternatives listed were: raise goats 66%, raise pigs 64%, raise rabbits/guinean rats 52%, buy meat 28%, cows 16%, employment 7%.

II. Setting fires

a. Fire Setting Behavior

Levels of self -reported behavior:

- Pre: 99% said they have not started a fire in NNP in the last 5 years

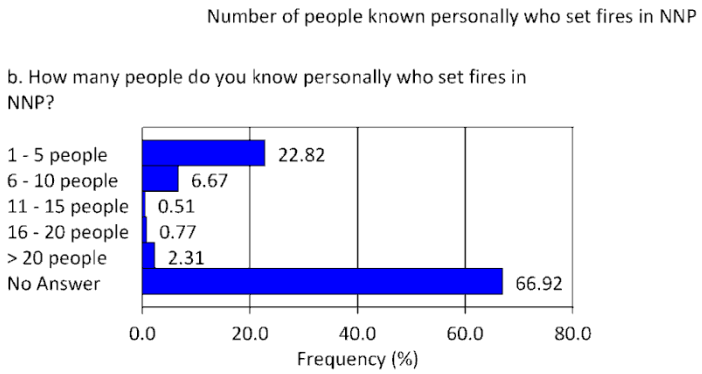
- Pre: 100% said they do not currently use fire in NNP for any reason
- Post: 100% said they have not used fire in or around NNP for the past 3 years

“Do people set fires in NNP?”

- Pre: yes = 66%, no = 22, don’t know= 12
- Post: yes = 48%, no = 41%, do not know = 11%

If yes, how many people do you personally know who set fires?

- Pre:



- Post: none = 88%, 1-5 people = 10%, more than 20 people = 2%

For clearing land next to NNP, a very important issue to this audience in which the majority were farmers

- Pre: 10% said they have used fire in the past 5 years to clear land next to NNP
- Pre: .5 % said they currently use fire to clear land next to NNP

The question was asked in the post education and outreach survey: In the past 3 years, have you used fire in or around Nyungwe for any reason?

- Post: 100% of respondents answered “No”.

The top reasons for setting fires were:

- Pre: honey collection (66%), burning land next to NNP (28%), cooking (13%), and keeping warm (5%). Don’t know = 10%.
- Post: honey collection 48%, poaching 14%, cooking 4%, create pasture 3%, do not know 21%

b. Influencing fire setting behavior

- Pre: 34% of respondents have started a conversation with someone to encourage them to stop setting fires in NNP
- Post: 43% of respondents have started a conversation with someone to encourage them to stop setting fires in NNP

- Pre: 34% of respondents have started a conversation with someone to encourage them to stop clearing land with fire next to NNP
- Post: 38% of respondents have started a conversation with someone to encourage them to stop clearing land with fire next to NNP

- Pre: 32% of respondents have started a conversation with someone about alternatives to

using fire to clear land next to NNP
- Post: 35% of respondents have started a conversation with someone about alternatives to using fire to clear land next to NNP

c. Attitudes toward setting fires in/near NNP

Fires should not be set in NNP
- Pre: agree = 82%, disagree = 11%, don't know = 7%
- Post: agree = 92%, disagree = 8%, do not know = 1%

Agree that it is their responsibility to work with park authorities to help stop fires being set in NNP
- Pre: agree = 90%, disagree = 1%, don't know = 9%
- Post: agree = 92%, disagree = 8%, do not know = 1%

d. Knowledge about impact of fire

Is fire is a problem for animals and plants in NNP
- Pre: yes = 90%, no = 1%, don't know = 9%
- Post: yes = 99%, no = 0.5%, don't know = 0.5%

If yes, how is it a problem for animals in NNP? Interviewers allowed respondents to give their own answers:
- Pre: Animals are killed by the fire (89%), Plants are killed by the fire (63%), animals lose their habitats/homes (34%), animals lose their food (21%), animals lose their breeding sites (8%), ecological processes are lost (e.g. when pollinators are lost) (5%), don't know (1 %)
- Post: Animals are killed by the fire (69%), Plants are killed by the fire (47%), animals migrate due to lost habitat (34%), desertification 9%, extinction of plant species (4%) animals lose their food (3%),

Is fire a problem for people living in communities surrounding NNP?
- Pre: yes = 89%, no = 5%, don't know = 7%
- Post: yes = 93%, no = 4%, do not know = 3%

If yes, how is it a problem for people living in communities surrounding NNP?
- Pre: The top answers given were: Local people commit time to fighting fires, which could be used for other activities (67%), fires and habitat destruction cause reduced tourism to NNP, and reduce economic benefits from tourism to people (25%), fires and the habitat destruction cause reduced hydrological services from NNP (19%), fighting fires costs NNP a lot of money (9%), fires reduce fresh air from forest (8%), and fires and habitat destruction cause reduced carbon sequestration by NNP(6%).
- Post: Local people commit time to fighting fires, which could be used for other activities (39%), fires reduce fresh air and rain from forest (19%), fires threaten nearby villages (8%), fires cause insecurity for surrounding communities (7%), fires cause air pollution (6%), fires can lead to injury/accident for those assisting to fight the fire (4%), fires can cause reduced tourism to NNP (3%)

e. Alternatives to setting fires

For those people who collect honey in NNP, are there alternative ways they can make honey?
- Pre: Yes (93%), no (2%), don't know (5%)
- Post: yes = 92%, no = 3%, do not know 5%

If yes, what?

- Pre: Find and manage own hives (64%), join a bee-keeping association (36%)
- Post: Access beekeepers/hives outside of NNP (98%), buy honey 1%

III. Cutting bamboo

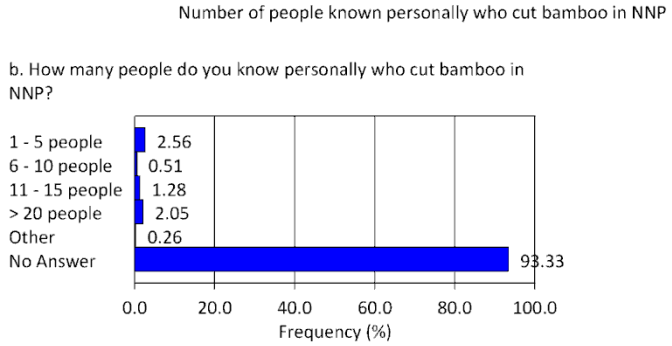
a. Cutting Bamboo Behavior

- Pre: 5% said they have collected bamboo in NNP in the last 5 years
- Pre: 0% said they currently collect bamboo in NNP
- Post: 0% said they currently collect bamboo in NNP

"Do people cut bamboo in NNP?"
Pre: yes = 9%, I don't know = 46%, no = 45%
Post: yes = 13%, no = 34%, do not know = 53%

If yes, how many people do you personally know that cut bamboo?

- Pre:



- Post: none = 91%, 1 to 5 people = 4%, more than 20 people = 4%

The top reasons for cutting bamboo:

- Pre: baskets (22%), crafts (8%), and firewood (27%)
- Post: building materials (21%), handicrafts (20%), baskets (17%), firewood 4%

b. Influencing bamboo cutting behavior

- Pre: 16% of respondents have started a conversation with someone to encourage them to stop cutting bamboo in NNP
- Post: 29% of respondents have started a conversation with someone to encourage them to stop cutting bamboo in NNP

- Pre: 13% of respondents have started a conversation with someone about alternatives to cutting bamboo in NNP
- Post: 24% of respondents have started a conversation with someone about alternatives to cutting bamboo in NNP

c. Attitudes toward cutting bamboo in NNP

People should be allowed to cut bamboo in NNP:

- Pre: agree = 82% agree, disagree = 10% said disagree, do not know = 9%
- Post: agree = 75%, disagree = 18%, do not know = 8%

Percent that agree it is their responsibility to support park authorities to stop people from cutting bamboo in NNP:

- Pre: 91% agree
- Post: 96% agree

d. Knowledge about impact of cutting bamboo

"Are there any animals that are particularly affected by bamboo cutting in NNP?"

- Pre: 54% said yes for (no = 7%, don't know = 39%)
- Post: yes = 55%, no = 75, do not know 38%

If yes, which ones:

- Pre: 12% of those who said "yes" correctly said "owl faced monkey". 25% said "don't know". Other replies included "all animals" (9%) and a variety of animals such as snakes (7%), birds (7%).
- Post: all (11%), birds (5%), snakes (5%), owl-faced monkey (3%), other (32%), do not know (25%)

Is cutting bamboo a problem for people living in communities surrounding NNP:

- Pre: 69% said yes, no = 7%, don't know = 24%
- Post: yes = 57%, no = 14%, do not know 29%

If yes, how is it a problem for people living in communities surrounding NNP? Respondents gave their own answers to interviewers.

- Pre: The top answers given were: Don't know (19%), owl faced monkeys are important for tourism, so impacts on their populations could impact tourism benefits (16%), and insecurity to adjacent population (6%).
- Post: the punishment for people who cut bamboo is a problem (22%), causes environmental destruction (15%), Other (21%)

e. Alternatives to Cutting Bamboo

For people who need bamboo, are there any other places for them to get bamboo other than NNP?

- Pre: Yes (73%), no (6%), don't know (21%)
- Post: yes 75%, no 11%, do not know 14%

If yes, where?

- Pre: Buy bamboo in the village (47%), plant bamboo in their fields (46%)
- Post: Plant bamboo in their field (91%), buy bamboo in the market (7%)

IV. Laws

Is it legal to cut bamboo in NNP?

- Pre: Yes (2%), no (95%), don't know (3%)
- Post: No 97%, do not know 2%, yes 1%

Is it against the law to set fires in NNP?

- Pre: Yes (54%), No (46%)
- Post: yes = 79%, no = 21%

Is it legal to hunt some animals in NNP?

- Pre: Yes (4%), no (94%), don't know (2%)
- Post: No = 97%, yes = 2%

Although the sample was too small, for the question "If you said 'yes', what animals are legal to hunt", the answer given

- Pre: "animals that can eat people's crops"
- Post: no answers given

Can people be fined for carrying out illegal activities in NNP?

- Pre: Yes (81%), no (3%), don't know (16%)
- Post: yes = 93%, no = 2%, do not know = 5%

Can people be imprisoned for carrying out illegal activities in NNP?

- Pre: Yes (94%), no (2%), don't know (6%)
- Post: yes = 95%, do not know = 3%, no = 1%

V. Protection of NNP (general, not per threat)

Have you actively supported or promoted the continued conservation of NNP?

- Pre: Yes (48%), no (42%), don't know (10%)
- Post: yes = 45%, no 51%, do not know = 3%

If yes, how have you supported or promoted the continued conservation of NNP?

- Pre: Suppressing fire (7%), forbidding people to enter or destroy the forest (8%), reporting people who destroy the park (7%). "Other" (71%) was not specified by the interviewers.
- Post: Participation in fighting fires (22%), educating others (19%), help NNP become more secure (9%), did not participate in activities that would destroy the park (5%), participated in an environmental club (2%)

Do you agree or disagree that it is your responsibility to encourage others to support the protection of NNP?

- Pre: Agree (94%), disagree (42%)
- Post: yes = 97%, no = 1%, do not know = 1%

Have you ever encouraged others to support the protection of NNP?

- Pre: Yes (52%), no (42%), don't know (6%)
- Post: yes = 50%, no = 49%, do not know = 1%

If yes, how?

- Pre: "Other" = 73%, but was not specified by interviewers or data entry people
- Post: sensitize community about NNP protection (37%), forbid community to participate in illegal activities within NNP (30%), advise community against participating in illegal activities within NNP (12%), advise community to help protect NNP (4%), advise community to help fight fires (3%), participate in fighting fires (3%)

Post survey Media questions

Did you listen to any radio program about NNP?

- Yes = 50%, no = 50%

If yes, what day of the week?

- Thursday 12%
- Sunday 5%
- Tuesday 5%
- Wenesday, Friday and Monday at 3% each
- Saturday 2%
- Do not remember 50%
- Do not know 15%

What was your favorite character?

- Gahigi 1%
- Kanyombya 1%
- All of them 1%
- Do not remember name 56%
- Do not know 33%

What were three important issues covered by the radio programme/magazine?

- Do not know 29%
- NNP protection 10%
- Do not remember 6%
- Avoid mining, poaching and tree cutting 4%
- Benefits of protecting NNP 4%
- Benefits of NNP, NNP protection, visiting NNP 4%
- Avoid mining, poaching and fire setting 3%
- Protection of the environment and animals 3%
- Other answers included combinations of avoiding mining, poaching tree cutting, fire setting
- Other answers emphasized protecting NNP and educating others

What do you call the volunteers who sensitize people about NNP?

- Do not know 71%
- ANICO 8%
- ORTPN 3%
- Park rangers 2%
- Other answers included leaders, cell executive, forest officer, community leader and naming an individual person

Have you ever met one?

- No = 80%
- Yes = 19%

If yes, where?

- Meeting 42%
- Speech 9%
- Neighbor or friend 9%
- Umuganda 3%

How many meetings conducted by ANICO have you participated in? (question 117)

- None 70%
- 3 = 6%
- 2 = 6%

- Many 5%
- 1 = 4%
- 5 = 3%

How many community sensitization events about NNP have you attended? (question 118)

- None 76%
- 1 = 9%
- 2 =6%
- 3 = 3%
- Many = 2%

What was your favorite part?

- A play = 15%
- Education about NNP project 3%
- 41% said none
- 11% = do not know
- The rest of the answers centered around protection of NNP themes

Who was the famous person there?

- None = 45%
- Do not know = 22%
- Kanyombya 18%
- Do not remember = 11%
- Boniface = 1%
- Agronome = <1%

What were the main messages at the event?

- Do not know 39%
- NNP protection 16%
- None 12%
- Keep NNP secure 8%
- Environmental protection 6%
- Sensitize the community to protect NNP 4%

Have you ever attended community outreach events organized by students?

- No = 82%
- Yes = 18%

What were the messages at the event?

- Do not know 38%
- How to protect NNP 26%
- None 7%
- Advise community against participating in damaging behaviors/actions 5%
- A play about park conservation 4%
- Benefits of NNP 4%
- Protection of NNP 3%
- Other answers included a play about NNP and a play about chimpanzees

Are there any students in this household that belong to environmental clubs?

- No = 90%
- Yes = 10%

What knowledge have you learned from them about NNP?

- Education about NNP protection = 19%
- Not to destroy NNP = 16%
- Nothing = 10%
- The value of NNP = 10%

- To avoid people that damage NNP = 7%
- Other answers include: opposing those who set fires in NNP; NNP contribution to hydrological cycle; actions to protect birds; value of the forest; laws against poaching and cutting trees in NNP; NNP is habitat for animals and brings income to the community; not to poach or cut trees.

Are there any posters with messages about NNP in your village?

- No = 79%
- Yes = 21%

What messages about NNP are in the posters?

- Animals that live in NNP = 11%
- Protection of NNP = 8%
- Avoiding causing harm to NNP = 8%
- Anti-poaching = 4%
- Do not know = 7%
- Did not read message = 4%
- Do not know how to read = 4%
- All people must help protect NNP = 2%

Which of these posters helped you learn the most about NNP?

- Chimpanzee = 23%
- Animal (general) = 20%
- None = 11%
- Poaching theme = 6%
- Fire theme = 2%
- Poster outlining possible punishments for breaking the law = 2%
- Other answers included baboon poster; gorilla; beekeeping; canopy.

ANNEX II: School Survey Pre & Post-implementation survey results

A) Demographic Information

- Student ages ranged from 14 to 24
- 50% were girls, 50% were boys
- 30% were Primary 4-6 students, 45% were Secondary 1-3 students, 25% were Secondary 4-6 students
- Same proportions and ages as the pre-implementation survey

B) Animal knowledge

Animals living in Nyungwe

- Students generally correctly stated that blue touraco, baboon, colobus monkey, Owlfaced monkey and L'hoesti monkey are found in Nyungwe
- 57% correctly stated that chimpanzees live in Nyungwe. Before, 38% said that chimpanzees live in Nyungwe
- Many students thought that gorillas, giraffes, and elephants (animals that do NOT live in Nyungwe) live in Nyungwe (Gorilla: 61% said it lives in Nyungwe; Giraffe: 62%; Elephant: 60%)

Names of animals

- Animals found in Nyungwe were correctly identified by 0 to 25% of respondents (depending on species). Significantly more students could name baboon, Colobus monkey, and chimpanzee post-campaign.
- Chimpanzees were named correctly by 36% of respondents, compared with 25% of respondents in the pre-implementation survey.
- Pilot schools showed significant increases in naming baboon, Colobus monkey, giraffe, chimpanzee and elephant comparing before and after working with them.
- Gorillas, giraffes, and elephants were identified by 60% or more of students.

C) Knowledge Questions about Nyungwe

Students showed a good understanding of Nyungwe as a national park and the rules of the park, as they did in the baseline. Post-implementation scores included:

- 77% knew that Nyungwe Forest is part of their district
- 97% knew Nyungwe is a national park
- 95% knew that cutting bamboo in Nyungwe is not allowed
- 78% knew that fires affect the animals in the forest
- 100% knew that hunting in Nyungwe Forest is NOT allowed
- 90% knew that Nyungwe forest produces water
- 84% said that tourists come to Nyungwe to see chimpanzees – before 74% said this. (A positive trend, but not statistically significant at 95% confidence interval)
- 43% knew that in Rwanda, chimpanzees are only found in Nyungwe

- 35% said that human diseases can make chimpanzees sick
- 37% knew Africa is the only place where chimpanzees are found in the wild

D) Attitude Questions

The survey indicated that:

- Almost all respondents (98%) believe Nyungwe should be protected
- 84% said Nyungwe would NOT be better used as farmland (compared with 73% pre-campaign). 89% of students in the pilot schools said Nyungwe would NOT be better used as farmland, significantly greater than 71% pre-implementation of the education program.
- 92% feel Nyungwe is valuable because it makes water
- 87% believe chimpanzees are interesting animals, and they are important because tourists come to see them (97%), and tourists are important for communities near Nyungwe (71%)
- 75% feel some sense of responsibility toward protecting Nyungwe. 79% of pilot school students feel this way.

E) Behavior Questions

For the most part, students indicated low levels of participation in threat behaviors to Nyungwe (cutting bamboo, setting fires, and hunting.) Except for encouraging family members not to do actions which may transmit diseases to chimpanzees, students encouraged family members to do pro-conservation behaviors.

- 80% said "not at all like me" when responding to "Some children cut bamboo in Nyungwe Forest" (10% "a little like me", 10% "a lot like me")
- 78% said "not at all like me" when responding to "Some children set fires in Nyungwe Forest" (10% "a little like me", 13% "a lot like me")
- 79% said "not at all like me" when responding to "Some children hunt animals in Nyungwe Forest" (7% "a little like me", 14% "a lot like me")
- 82% said "not at all like me" when responding to "Some children encourage their family to hunt animals in Nyungwe Forest" (11% "a little like me", 8% "a lot like me")
- 87% said "not at all like me" when responding to "Some children encourage their family to set fires in Nyungwe" (7% "a little like me", 6% "a lot like me")
- 79% said "a lot like me" when responding to "Some children encourage their father/brother or others to stop cutting bamboo in Nyungwe Forest" (6% "a little like me", 15% "not at all like me")
- 14% said "a lot like me" for "Some children encourage their family or friends not to spit, litter or use the bush toilet", and 6% said "a little like me". For pilot school students, the percentage of students for "a lot like me" was 17% and "a little like me" was 6%, which shows an increase in understanding and action with the implementation of conservation lessons (pre-implementation levels were 6% "a lot like me" and 2% "a little like me")

F) Environmental clubs and awareness of education/outreach efforts

In addition to the questions that were asked both before and after the work with the pilot students, some questions were asked about environmental clubs and student awareness of the education/outreach efforts afterwards.

- Overall, 52% of students surveyed were members of their school's environmental club. This was similar in pilot and control schools
- Those who were members listed "learn about Nyungwe conservation" (62%) and "educating communities" (53%) as the main activities, with "planting trees" (18%) as the next one. Other answers included "learn about environmental protection" (11%) or Nyungwe specific activities such as songs, dramas, or debates about Nyungwe (1-3%), but these were very low. It is unclear if those who put "learn about Nyungwe conservation" learned the information through some type of creative activity.

For those students who were not members of their school's environmental club, 56% said they have attended activities organized by the school environmental club.

We asked whether students had ever used the education materials about NNP at school.

- 77% of students overall responded that they had, with posters, books, films and dramas as the main materials.
- 86% of pilot school students, compared with 68% of control school students (significantly more) said they used education materials about NNP
- Books and posters were considered to have the most information about NNP
- The top 4 materials were their favorite materials as well