Received: 2 April 2020 | Revised: 3 August 2020 | Accepted: 8 August 2020

DOI: 10.1002/ajp.23191

RESEARCH ARTICLE

AMERICAN JOURNAL OF PRIMATOLOGY WILEY

Assessing attitudes towards gorilla conservation via employee interviews

Martha M. Robbins

Department of Primatology, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany

Correspondence
Martha M. Robbins, Department of Primatology, Max Planck Institute for Evolutionary Anthropology, Deutscher Platz 6, 04103 Leipzig, Germany.
Email: robbins@eva.mpg.de

Funding information
Max-Planck-Gesellschaft; United States Fish and Wildlife Service Great Ape Fund; Berggorilla und Regenwald Direkthilfe; Tusk Trust; Taipei Zoo

Abstract

To determine the effectiveness of conservation strategies, not only should we monitor biological variables, such as population size and levels of illegal activity, but also we should examine changes in attitudes and behavior of local community members. Here, I use semistructured interviews of employees at two field sites, in Bwindi Impenetrable National Park, Uganda and Loango National Park, Gabon, to understand if their employment influenced their attitude towards gorillas and conservation and led to behavior change. In contrast to western views of gorillas as "gentle giants," staff viewed gorillas as dangerous animals before working for these projects. Overall, employment leads to viewing conservation and gorillas more positively, and in many cases, viewing the gorillas as kin. The most common value attributed to the gorillas was economic, yet intrinsic and non-use existence values were frequently mentioned. Loango staff, but not Bwindi staff, reported behavior change related to hunting and bushmeat consumption, which likely is related to bushmeat consumption being commonplace in Gabon but not in Uganda. The Bwindi staff seemed to have a more positive and broader outlook toward conservation than the Loango staff, possibly because they had more years of formal education, they worked with gorillas longer, there is more history of conservation activities in Bwindi, and/or they have been less directly affected by negative consequences of conservation (e.g., crop raiding). This study shows the importance of explaining that gorillas are not dangerous if not provoked and using their human-like characteristics as a means to change conservation values and interest of local communities, while concurrently recognizing that providing economic benefits and reducing negative effects of wildlife are a reality for conservation buy-in.

KEYWORDS
attitude, behavior change, employee, gorilla

1 | INTRODUCTION

> *"I used to view gorillas as meat, now I see them as my brothers"*
> *"We love the gorillas because they always need others. He cries when he is alone, but he is quiet when he is with others."*

Effective conservation strategies for endangered species are multifaceted. The primary foci of conservation efforts often have been monitoring and evaluating to quantitatively assess change in particular variables, such as the number of animals of interest, levels of illegal activities, and so forth, which are crucial for effective evidence-based conservation (Tranquilli, 2016). However, it is recognized that increased efforts, addressing the needs of local communities, and novel, interdisciplinary approaches are necessary to reverse species' declines and achieve success in conservation (Estrada et al., 2018; Hill, 2002; Wich & Marshall, 2016). Biosocial conservation and ethnoprimatology seek to link biological and social methods to better understand human–primate interactions, the root causes of threats to primates, and solutions to mitigate such threats (Malone et al., 2014; Remis & Hardin, 2009; Setchell, Fairet, Shutt, Waters, & Bell, 2017). Considering social, cultural, ecological, and economic values of primates provide a holistic approach to determine the most desirable conservation actions; however, they are not necessarily integrated into conservation management (Estrada et al., 2018; Hill, 2002; Manfredo et al., 2017; Remis & Hardin, 2009; Wich & Marshall, 2016). Examining perceptions of local people can also be a useful means to understand why particular conservation efforts are working or not and guide future initiatives (Bennett, 2016; Manfredo et al., 2017; Setchell et al., 2017).

Gorillas are complex species in terms of public perception and their conservation on local and global scales. Three subspecies of gorillas are critically endangered (*Gorilla gorilla gorilla*, *Gorilla gorilla diehl*, and *Gorilla beringei graueri*) and mountain gorillas (*Gorilla beringei beringei*) were recently downlisted to endangered, with the major threats to their survival being illegal killings, habitat destruction, and risk of disease (Plumptre et al., 2016; Strindberg et al., 2018). In western society, the view towards gorillas has shifted from that of dangerous "King Kong" to the "gentle giant" or "charismatic megafauna" through the efforts of Dian Fossey, conservation organizations, and the media at large (Fossey, 1983; Weber & Vedder, 2001). One consequence of this shift of public opinion is that gorillas, particularly mountain gorillas, have been the focus of intense conservation efforts (Robbins et al., 2011; Weber & Vedder, 2001). As part of this, gorillas are a prime example of how in situ tourism can support conservation efforts (Gray & Rutagarama, 2011; Shutt, 2014; Weber & Vedder, 2001). Tourists are attracted to viewing wild gorillas in part because they perceive gorillas to be human-like and tourists value close proximity to the gorillas to feel emotionally connected to them (Setchell et al., 2017; Shutt, 2014). In contrast, in communities neighboring gorilla habitat, gorillas are generally perceived as dangerous, not providing benefits to people, and are often listed as culprits of crop raiding (Breuer, Mavinga, Evans, & Lukas, 2017; Fairet, 2012; Namara, Gray, & McNeilage, 2000; Seiler & Robbins, 2016). Gorillas have only rarely been documented as part of the cultural heritage of people living alongside them, with some viewing them as a part of their sociocultural construct with nature (Angwafo & Chuo, 2016; Giles-Vernick & Rupp, 2006; Koehler, 2005; Oishi, 2013) and others viewing them in a negative light, such as a bad omen (Namara et al., 2000). Taboos against hunting gorillas have been documented in a few areas, typically because they are considered to be too similar to humans or there is the belief that people can be reincarnated as gorillas (Giles-Vernick & Rupp, 2006; Koehler, 2005; Namara et al., 2000), but they are considered to have medicinal value in some places (Angwafo & Chuo, 2016) and are killed as bushmeat throughout most of their range (e.g., Plumptre et al., 2016; Strindberg et al., 2018; Tagg et al., 2018). Effective conservation of gorillas and other primates may require reconciling the views and needs of local communities with that of major conservation initiatives such as law enforcement, mediating human–wildlife interactions, and tourism (Angwafo & Chuo, 2016; Blomley et al., 2010).

As a means to address such disconnect and use a biosocial approach in areas where substantial quantitative biological research has been conducted on gorillas, the goal of this study is to use semistructured interviews to examine perceptions of gorillas, conservation values, and behaviors of in-country employees at two gorilla research projects (Bwindi Impenetrable National Park, Uganda and Loango National Park, Gabon). Most studies examining changes in knowledge, behavior, and attitudes focus on community members living in and around protected areas (e.g., Breuer et al., 2017; Reibelt et al., 2017; Yuliani et al., 2018). Interviewing local employees of research projects can be useful because they are trained and work in a framework of science and conservation, yet have grown up in and live in local communities affected by conservation management decisions. Employees receive direct economic benefits from working for research projects, but it is unclear how their work influences their views on conservation and how they may communicate about their work to other community members.

Bwindi Impenetrable National Park has been the focus of extensive conservation efforts since it became a national park in 1991 (Table 1; Baker, Milner-Gulland, & Leader-Williams, 2012; Blomley et al., 2010; Gray & Rutagarama, 2011). Mountain gorillas do not play a large role in the cultural history of Bwindi, with the key story being that hunters would return home immediately if they encountered gorillas in the forest because gorillas were considered bad luck (Namara et al., 2000). Following park gazettement, there were high levels of resentment and conflict from the surrounding communities because their access to the park was largely stopped (Baker et al., 2012; Blomley et al., 2010; Gray & Rutagarama, 2011). In the past decades, a few gorillas are known to have been killed for illegal trade, when they were crop raiding, and by poachers hunting other animals (Baker et al., 2012). Mountain gorillas are not consumed as bushmeat but are at risk of being caught in snares set to hunt other wildlife, namely duiker (*Cephalophus nigri*). Tourism provides employment for a few thousand local community members as park staff, porters, artisans, and other areas of the tourism sector. The Uganda Wildlife Authority also has a revenue sharing program in which 20% of park entry fees and a $5 levy per gorilla tourism permit sold are

TABLE 1 Overview of study sites and interviewee information

	Loango	Bwindi
Gorilla species	Western lowland gorilla	Mountain gorilla
Size of the national park (km^2)	1550	330
Established as a national park	2002	1991
Gorilla population estimate	1 gorilla per km^2[a]	459 gorillas[b]
Habituated gorilla groups	1	19
Tourism began	2016	1992
Number of tourists in 2019	~300	~20,000
Research project started	2005	1998
Employees interviewed	10	11
Age of Employees (mean and range)	35 (26–40)	39 (25–56)
Time working for project (years; mean and range)	3.5 (0.25–10)	10 (0.75–21)
Year of education (mean and range)	6 (2–10)	12 (2–17)
Employees with university/college degree	0	5
Employees that completed primary education	5	9

[a]Hagemann et al. (2019).

[b]Hickey et al. (2019).

distributed to communities living along the park boundary, which totals only about $11 per $600 gorilla permit (Tumusiime & Vedeld, 2012).

Loango National Park is one of 13 Gabonese national parks gazetted in 2002 (Table 1). Because national parks can still be considered to be in their infancy in Gabon, Loango has been the focus of fewer conservation efforts than Bwindi. Loango has only 12 eco-guides who are responsible for patrolling for illegal activities. Gorillas in Loango are threatened by snares that are predominately set for other wildlife and they have been documented to have been killed as a result of human–wildlife conflict, namely crop raiding (Fairet, 2012). While bushmeat consumption of primates occurs in Gabon, gorillas are not commonly consumed around Loango National Park. A tourism lodge for wildlife viewing and fishing has been operating in Loango since 2003, providing employment to a limited number of local community members (<100). Other conservation activities have included trash pick-up on the beach and building an electric fence to deter elephant crop raiding in a village bordering the park.

2 | METHODS

The Uganda Wildlife Authority and the Uganda National Council of Science and Technology in Uganda and the Agence Nationale des Parcs Nationaux and the Centre National de la Recherche Scientifique et Technique of Gabon granted permission to conduct this research, which adhered to the American Society of Primatologists' principles for the ethical treatment of primates. The Max Planck Institute for Evolutionary Anthropology does not require Institutional Review Board approval. All interviews and data are available upon request.

This study was conducted through interviews with Ugandan employees of the Bwindi Gorilla Project ($N = 11$) and the Gabonese employees of the Loango Gorilla Project ($N = 10$), which are both directed by Martha Robbins (see Table 1 for details of projects). Both projects focused on studying social relationships, feeding ecology, and population dynamics of the two species of gorillas (e.g., Ganas, Robbins, Nkurunungi, Kaplin, & McNeilage, 2004; Hagemann et al., 2019; Head, Boesch, Makaga, & Robbins, 2011; Robbins et al., 2019; Robbins, Gray, Kagoda, & Robbins, 2009; Seiler, Boesch, Mundry, Stephens, & Robbins, 2017; Seiler & Robbins, 2020). The data collection protocols and training are given to staff were largely the same at the two study sites. Employees at both study sites received ~6 h of formal classroom training between 2017 and 2019 on social behavior, feeding ecology, population dynamics, and conservation issues related to either mountain gorillas or western gorillas. Employees in Loango have served as guides for gorilla tourism since mid-2016 and some staff in Bwindi have assisted with gorilla tourism since 2016.

All employees worked as trackers and/or field assistants with habituated gorillas (Table 1), with the exception of one person in Loango (the cook/camp manager) and one person in Bwindi (manager of the Bwindi Ape Conservation Education Partnership, a conservation education program working with four primary schools near Bwindi; also the only woman interviewed). Nearly all of the employees in Bwindi (9 of the 11) are originally from areas near Bwindi. One grew up in a town about 65 km away and another grew up in Kampala (the capital ~450 km away; he is Buganda and all other Bwindi staff are Bukiga). Only 1 of 10 Loango employees was from a village bordering Loango National Park. Three others were from towns or cities in Gabon; two of those spent time in forested areas before working at Loango as they reported hunting to pay for their secondary school fees. The other six employees were Babongo people from villages bordering Waka National Park, which is ~300 km away from Loango. The Babongo employees were hired specifically for their traditional forest knowledge and ability to track/follow animal signs in the forest.

Semistructured interviews enable respondents to answer questions more broadly than structured questionnaires (Drury, Homewood, & Randall, 2011). In Bwindi, questions were asked in English or Rukiga (local vernacular), with someone translating the Rukiga directly into English during the interview. In Loango, the interviews were conducted in French or Babongo (local vernacular), with Babongo translated into French during the interview. All interviews were video recorded and then transcribed. The interviews in French were translated into English. The semistructure interviews consisted of the following five questions as the framework of the interview, with follow-ups depending on the answer:

1. How have your thoughts and opinions about gorillas changed from before and after working for the project?
2. Is it necessary to protect gorillas and why? This general question was asked to determine what conservation values the respondents placed on gorillas. I asked the general question of "Why protect gorillas?" rather than ask specifically if gorillas have the specific values as a means to get spontaneous responses and not yes/no responses to each type of value. Furthermore, I extracted mention of these conservation values of the gorillas and the parks from answers to all questions. I considered different types of conservation value with the following definitions:
   - Intrinsic value: Nature has value, independent of people. Caring for lifeforms is a moral necessity. Valuing something for what it is, not what it does (Chan et al., 2016; Piccolo, 2017; Vucetich, Bruskotter, & Nelson, 2015). Stating that a lack of protection for gorillas could lead to their extinction or that we need to protect gorillas, so our children and children's children can see them were considered a reflection of intrinsic value.
   - Non-use existence value: Being in nature or seeing nature brings people pleasure or satisfaction. Statements about liking or loving the gorillas were considered as a reflection of non-use existence value, unless it was embedded a statement about loving gorillas because of their economic benefits.
   - Ecosystem services: Benefits humans derive from a healthy natural environment, such as watersheds, climate regulation, and so forth.
   - Cultural value: Representing traditional stories or beliefs of local communities.
   - Economic value: Providing monetary, economic benefit, or infrastructure development to individuals or communities via employment, business, tourism, or community projects.
3. Do you think it is a good idea or bad idea that Bwindi/Loango is a national park (or do you have positive or negative thoughts about the park)? Do you think it is a good idea or a bad idea that there are other national parks in your country?
4. Who do you talk to outside of work about gorillas? What do you talk to other people about the gorillas?
5. How has your behavior changed since you have been working with the gorillas?

3 | RESULTS

3.1 | Change in thoughts and opinions about gorillas

All employees at both sites discussed a change in their perceptions of gorillas from before they worked on the project to the present (Table 2). Most said that they initially thought gorillas were dangerous and they were afraid of them, but they were no longer afraid of habituated gorillas. One respondent in Loango said that he had previously viewed gorillas as meat, but now considered them his brothers. Other initial thoughts on the gorillas in Bwindi were that they had no value other than for tourism or recalling that villagers had killed gorillas in the past because they were bad luck. The two employees in Bwindi whose fathers had worked for the project when they were children expected the gorillas to have human abilities such as being able to write or talk.

In Loango, four people stated that currently, they were still afraid of unhabituated gorillas in Loango and elsewhere, but this was not mentioned by Bwindi staff. This difference may be because all the staff in Loango were involved in habituation at the time of the interviews and/or come into contact with unhabituated gorillas near their villages. Many Bwindi employees helped habituate gorillas more than a decade before this study, and they also encounter unhabituated gorillas regularly in the forest. A few staff at both sites asserted that their behavior around the habituated gorillas is important, implying that they recognize the importance of behaving in a manner to not evoke negative

TABLE 2 Change in perceptions/views towards gorillas

	Initial thoughts[a]	Current thoughts[a]
Bwindi (n = 11)		
Gorillas are dangerous and/or they were afraid	9	1
Gorillas have human characteristics (e.g., can talk)	2	0
Gorillas have only economic value	2	0
Recalled traditional belief that gorillas are bad luck	2	0
View gorillas as family/similar to humans	0	2
Their behavior around the gorillas is important	0	2
Loango (n = 10)		
Gorillas are dangerous and/or they were afraid	9	4[b]
Viewed them as meat	1	0
Their behavior around the gorillas is important	0	2
View gorillas as family/similar to humans	0	2

[a]Responses to independent open-ended questions, with respondents giving their previous thoughts and current thoughts; these were not given as before and after questions.

[b]All respondents were referring to unhabituated gorillas.

TABLE 3 Summary of how many employers mentioned different types of conservation value of gorillas during the interviews

Conservation values	Loango (n = 10)	Bwindi (n = 11)
Economic (total)	4	10
Economic (employment)	4	10
Economic (tourism)	1	4
Economic (community development)	0	6
Intrinsic value	1	7
Non-use existence value	3	6
Ecosystem services	2	4
Cultural (positive/negative)	0	2/3
Protection is good (no specific reason)	3	0

Note: See Section 2 for definitions of different values.

responses from the gorillas. Lastly, at both sites, a few people stated that they now view gorillas as being human-like or as family. An understanding of how to behave around gorillas and viewing them as similar to humans is nicely summed up by the statement of a Loango employee: "*My views have changed. Now I know that the gorillas are like if you anger a man -- if you bother his family, he will get angry*."

3.2 | Conservation values

The most frequently mentioned value of protecting gorillas at both sites was economic, namely that it provides jobs (Table 3). Tourism and community development were mentioned many times by Bwindi employees but only once by a Loango employee. Intrinsic value (the need to prevent gorillas from going extinct; gorillas should be protected so future generations can see them) was mentioned by most Bwindi staff, but only one Loango staff. Non-use existence value was mentioned by staff at both sites, by such statements as they like gorillas, love gorillas, or gorillas that make them happy. A notable example of non-use existence value is in the statement "*I have learned many, many new things. I think the animals are my friends and I think the animals think I am their friend*." Ecosystem services, namely seed dispersal, rainfall patterns, and ecosystem diversity were mentioned at both sites. Cultural values were mentioned by two staff in Bwindi, by stating that without the gorillas there would be no stories for villagers to tell in the future. They did not elaborate on the content of such stories. In addition, three Bwindi staff mentioned that gorillas were viewed as bad omens in the past, which is a cultural value, although a negative one.

As a less abstract way to inquire how the employees felt about conservation, we also asked them if they thought it was good or bad (or if they had positive or negative thoughts about) that their place of work was a national park. Then, they were asked if they thought other national parks in their country were a good or bad idea (Table 4). All employees stated that the park where they worked was good, but a few in Loango cited negative aspects of the park including crop raiding (n = 2) and hunting being illegal (n = 1). Views towards other national parks in their country diverged greatly between the Bwindi and Loango staff. A total of 9 of 11 Bwindi staff stated that other national parks were a good idea, with only a few mentions of negative aspects of parks in general (e.g., crop raiding, parks only protect wildlife). In contrast, most Loango staff talked about crop raiding and lack of infrastructure, which was in direct reference to Waka National Park, where six of these employees live.

3.3 | Communicating with others about the gorillas

All employees at both sites said they talk with family, friends, and/or community members (Table 5). The most frequent topic of conversation by the Loango employees concerned their feelings

TABLE 4 Positive or negative views about the park where they work as well as other national parks in their country

	Own park (Loango/Bwindi)	Other parks (Loango/Bwindi)
Positive	Provides employment/money (2/5)	Protects wildlife (2/3)
	Reduces hunting (2/3)	Ecosystem services (0/2)
	Ecosystem service/environmental value (2/3)	Provide employment/money (0/2)
	Tourism (0/2)	Developing infrastructure (0/1)
	Prevents crop raiding (1/0)	Reduces hunting (1/0)
	Research (0/1)	
Negative	People feel inferior to wildlife (1/0)	Animals leave the park and crop feed (8/2)
	Parks are seen as for foreigners (1/0)	Infrastructure is worse (4[a]/0)
	Villagers complain that only those near park	No employment (1/0)
	benefit (0/2)	Can no longer hunt or fish (1/0)
		Parks only protect wildlife not people (1/1)

[a]All respondents were referring to Waka National Park, where they live.

TABLE 5 Responses of what the employees talk about with people outside of work

	Loango (n = 10)	Bwindi (*n* = 11)
Who do they talk to?		
Family	9	8
Friends	2	2
Community members	2	9
What do they discuss?		
Work life and employment (e.g., "*the work is good*," "*the work is hard*," "*villagers ask me how they can get a job*")	6	6
Feelings towards gorillas (e.g., "*gorillas are not dangerous*," "*gorillas are my friends*")	8	3
Gorilla behavior and characteristics (e.g., "*I explain…climbing for food, walking, sleeping*," "*intergoup encounters*," "*female dispersal*")	2	7
How and why to conserve gorillas (e.g., "*people shouldn't eat gorillas*," "*not throw stones at them*")	1	5
Similarities of gorillas and humans (e.g., "*gorillas are like people*," "*gorillas are closely related to us*")	1	2

towards the gorillas, such as how they are misunderstood, they are calm, and they should be respected (Table 5). That fewer Bwindi staff mentioned such topics may be a reflection of their longer employment on average and/or the long history of habituated gorillas in Bwindi. The most common topic mentioned in Bwindi was aspects of gorilla behavior. Another common topic of discussion at both sites was how they performed their jobs, specifically how they behave around gorillas and how it is possible to get close to gorillas. A few people at both sites said they have discussed how gorillas are like humans. One person in Loango said he has discussed with others that they should not eat gorillas, whereas in Bwindi, two people said they have told villagers to not throw stones at the gorillas (as they do with baboons when they crop raid). In Bwindi, but not Loango, many employees reported discussions of the economic benefits of gorillas and/or how to get a job with them.

3.4 | Behavior change since employed

There was a dichotomy in responses to how employees have changed their behavior since working for the project (Table 6). In Loango, the responses focused almost entirely on no longer eating bushmeat, changing their hunting behavior, or dissuading others from hunting. These behavior changes were mentioned less by Bwindi staff, with the main illegal activity mentioned being firewood collection. The behavior change responses in Bwindi focused more on either personal growth (*n* = 8; e.g., being in a position of leadership and responsibility, public speaking) or conservation activities such as reducing litter (*n* = 3) or planting indigenous trees (*n* = 1). Staff no longer fearing the gorillas and talking to family and others about the gorillas both could be considered behavior change (see Table 2), but these were not specifically mentioned by employees in response to this question.

4 | DISCUSSION

By interviewing employees of two long-term research sites, insight into past and present views towards wild gorillas, conservation values, and behavior change was obtained. In addition to the key role that law enforcement plays in the persistence of great apes in specific areas, the presence of research sites and tourism is beneficial for their conservation (Tranquilli et al., 2012; Wrangham & Ross, 2008). An obvious caveat to interpreting the results of this study is that the employees were talking with their employer, which may have biased answers to the positive. However, negative feelings were routinely expressed by staff at both sites. Conducting the same surveys with community members who do not work with the gorillas would have provided a comparison of views based on whether people benefitted directly through employment and direct interaction with the gorillas, but was beyond the scope of this study.

TABLE 6 Behavior change reported by employees

Type of behavior change	Loango (*n* = 10)	Bwindi (*n* = 11)
Behaviors no longer exhibited or tolerated (e.g., eating primates, hunting, eating bushmeat, spitting in the forest, collecting firewood from the forest, littering)	9	6
New behaviors done/learnt about (e.g., aware about disease, plant indigenous tree at home, reuse plastic, report illegal activities)	0	5
Personal growth (e.g., leadership, public speaking, taking responsibility, learning and growing, comfortable working with foreigners)	0	8

Our findings can be put in the framework of a study conducted on community members' views on conservation near Bwindi, which grouped responses into "win-win" narratives in which there are positive outcomes for both conservation and local communities, a "traditionalist" narrative in which people are critical of conservation, or an "ambivalence" narrative in which people express hope for conservation (largely due to tourism) but still are critical of the costs they are paying for conservation (Tumusiime & Svarstad, 2011). Bwindi employees largely presented the "win-win" narrative, by stating that the park itself is good and that local community members are benefitting. In contrast, Loango employees had more of a traditionalist or ambivalence narrative, in which the prevailing attitude was that Loango as a park was good but that conservation elsewhere was not good because of crop raiding and lack of benefits to people.

4.1 | Previous and current views towards gorillas

Nearly all employees at both sites reported that they were initially afraid of the gorillas and they viewed them as dangerous, as found in other community surveys (Breuer et al., 2017). In as little as a few months of employment, these views changed to seeing gorillas as calm, friendly, similar to humans, and/or misunderstood. The personal experience of the staff enabled them to change their negative perceptions of gorillas into positive ones. These initial negative views of gorillas are very different from those of western researchers and tourists who have an understanding of gorillas as being "gentle giants" and that it is possible to get close to the gorillas because of habituation (Shutt, 2014).

4.2 | Value of gorillas

"*The gorillas are gold*," a statement made by a Bwindi employee, stands in stark contrast to the local traditional belief that they are a bad omen. The most common conservation value stated in both projects was economic value, which was expected given everyone interviewed benefitted in the form of his or her employment. Tourism specifically was mentioned frequently. Interestingly, a few people in Bwindi brought up a concern for tourism overusing the gorillas as a resource, in terms of habituating too many gorillas for tourism and the risk of disease transmission, which implies foresight for the value of the gorillas economically. Community development was mentioned by most Bwindi staff, which is likely a reflection of the heavy emphasis on such projects in the area (Blomley et al., 2010; Gray & Rutagarama, 2011). It was not mentioned by any Loango staff, but there are few projects in the region.

Most Bwindi staff mentioned either intrinsic or non-use existence value of the gorillas, whereas only a few Loango staff did. Western attitudes towards conserving primates, including fund-raising appeals for charismatic megafauna, tend to focus more on intrinsic or non-use existence values, specifically that we have a moral obligation to conserve gorillas or it makes us feel good, which is likely because site-specific economic, cultural, and environmental benefits are not directly perceived on a global scale. Moving from such abstract views of conservation to more concrete practicalities on a local level of having gorillas are in your backyard (and you are living in poverty), economic values come to the forefront. This raises the question of whether we should want to have local conservation efforts focusing primarily on instilling economic value, as has been the case with the gorillas in Bwindi (e.g., tourism development, community projects, revenue sharing), with little focus on intrinsic and non-use existence values, particularly for a species that is considered dangerous or a bad omen (again, Bwindi; see also [Koehler, 2005] for discussion of discord between western and local views on conservation). The integration of intrinsic/non-use existence and economic values, or gorillas as a transvalued species (Remis & Hardin, 2009) is exemplified by a joyous song written and sung by the Babongo staff from the Waka region who work in Loango. The lyrics first explain how Kamaya, the silverback of the group, reigns supreme in the forest and lives with his family, and then goes on to thank Kamaya for the money he brings them for many things including building their homes.

Asking the employees their views on the national park where they worked and other national parks in their country as an indirect way to uncover more concrete thoughts towards whether conservation was a useful approach because the Loango staff provided more detailed answers than to the general question of "why protect gorillas?" All respondents stated that it was good to have the park where they work as a national park, which is unsurprising since it provided their livelihood. Three Bwindi employees specified that only rich people benefitted from Bwindi before it was gazetted as a national park, whereas now many people (including "small"/not wealthy people) benefit. This provides an interesting contrast to the criticism that not everyone benefits from Bwindi and that people lost much when it was gazetted because they no longer had access to its resources (Blomley et al., 2010; Tumusiime & Svarstad, 2011). Whether this view is more widely shared by others living near the park and/or implies that the benefits per individual/capita are greater now than before gazettement is unknown. Views by people living near a protected area may vary depending on specific benefits attained. For example, more positive attitudes towards lions in Botswana were held by people working in the tourism industry than other local community members (Hemson, Maclennan, Mills, Johnson, & Macdonald, 2009).

One of the biggest differences between responses of the staff at the two locations emerged when asked if other national parks in the country were good or bad. The majority of Bwindi employees said other national parks were good, whereas the majority of Loango employees said they were bad. Crop raiding was the issue most often mentioned, which is a large problem throughout Gabon (Fairet, 2012). The Loango staff from Waka all complained about how the road leading to their village previously was maintained by a logging company and the road has fallen into a bad state of disrepair since the area was gazetted as a national park. Nearly all of the Loango staff had first-hand knowledge of or experiences with negative aspects of wildlife and the creation of national parks, which likely lead

to their disapproval of national parks other than Loango. In contrast to the Gabonese staff, the Bwindi staff seemed to have a more positive and broader outlook towards gorilla conservation and conservation in general. Possible reasons for this difference are the Bwindi staff having more years of formal education, working for project longer, more history of conservation activities in Bwindi, and/or being less directly affected by negatives (e.g., crop raiding).

4.3 | Employees communicating with people outside of work

Learning what the employees discuss about gorillas with people outside of the job provides insight into what community members want to learn. The three most common topics were the employees' feelings towards gorillas, aspects of gorilla behavior, and how the work is conducted. This shows that employees can serve as "gorilla ambassadors," especially since they are often respected members of their communities because of their jobs, which is beneficial for changing the misperceptions of gorillas. However, the question remains of how much change happens via discussions versus actually seeing the gorillas themselves (Breuer et al., 2017). Finding ways to have more community members see the gorillas in person may help change attitudes. To reach a wider audience, the information discussed with employees could be integrated into films crafted for local communities, including dialogue by the project staff, rather than showing films geared towards western audiences or only focus on conservation issues (Breuer et al., 2017; Leeds et al., 2017). In 2018, Bwindi staff members started showing communities and primary school children around Bwindi a 10 min "home made" film of gorilla behavior, namely mother–infant interactions, playing, grooming, and other social activities. Villagers were extremely interested and requested to watch it multiple times (Emilly Turinawe, personal communication). However, we are realistic that that increased awareness and seeing gorillas as valuable because they are similar to humans is not enough to get full buy-in for their conservation, especially when the basic needs of local communities are not being met (e.g., Meijaard, Wich, Ancrenaz, & Marshall, 2012).

4.4 | Behavior change

The types of behavior change reported by Loango employees primarily focused on the reduction of consuming primates, bushmeat, and hunting themselves or by other people. This was barely mentioned by the Bwindi staff. This difference was likely because nearly all of the Loango staff currently or have hunted in the past (not necessarily apes), whereas none of the Bwindi staff reported hunting in the past. Furthermore, bushmeat is a key source of protein in Gabon, whereas around Bwindi there is a taboo against eating apes and low levels of illegal hunting. The staff in Loango did not receive any specific training or guidance as part of their jobs about personally reducing hunting or consuming bushmeat, so it is possible that the Gabonese staff decided independently to change their hunting practices as a by-product of their work.

5 | CONCLUSION

Understanding behavior and attitude changes of employees of research projects can serve as a useful framework for designing community conservation programs aimed at altering local attitudes towards conservation. Despite differences in cultural practices of bushmeat consumption and the amount of conservation initiatives in the two locations, there was evidence that employees' work at both sites impacted their views on gorillas and conservation. This study shows that the generally negative perceptions of gorillas can be overcome and that understanding the similarities between gorillas and humans could be used as a means to improve conservation value and interest of local communities. However, this must be done concurrently with recognizing that providing economic benefits and reducing the negative effects of wildlife (e.g., crop raiding) are a reality for conservation buy-in. Furthermore, acknowledging that value changes by individuals may not always translate to group or societal change, or happen at the same pace, should be integrated into conservation management (Manfredo et al., 2017).

Despite most primates facing the same threats of habitat destruction, illegal killings, and risk of disease, strategies for conserving all primates are not necessarily a "one size fits all." The differing perceptions and behavior towards gorillas by local communities across Africa should be factored into conservation strategies. Aside from being the eyes and ears for law enforcement, employees of research projects can informally spread information about gorillas as well as influence the behavior of local community members, who have values more in line with their own. This exemplifies the value of research in changing attitudes as well as the opportunities to harness behavioral change in employees to more effectively modify large-scale community attitudes, in a specific localized fashion. Primates come in all shapes and sizes, so the specific approach to their conservation efforts on local and international levels needs to as well.

ACKNOWLEDGMENTS

This study was supported by Max Planck Society, the United States Fish and Wildlife Service Great Ape Fund, Tusk Trust, Berggorilla und Regenwald Direkthilfe, and Taipei Zoo. The author would like to thank the Uganda Wildlife Authority and the Uganda National Council of Science and Technology in Uganda and then Agence Nationale des Parcs Nationaux and the Centre National de la Recherche Scientifique et Technique of Gabon for permission and support to conduct the research. She would also like to thank all the staff for their cooperation and openness in participating in the project; it enabled us to learn a great deal. She would like to thank Jack Richardson for substantial input on the implementation, analysis, and interpretation of the study and Savannah Schultz for providing useful input to the development of the interview questions and project. Atlast, she would like to thank Emilly Turinawe, Rumen Martin

Fernandez, Sonia Domínguez Alba, Sarah Banet-Eugene, Lisa Faipoux, Rebecca Junod, and Paige Barnes for the assistance with the interviews, translating, and transcribing. Open access funding enabled and organized by Projekt DEAL.

DATA AVAILABILITY STATEMENT

All interviews and data are available upon request.

ORCID

Martha M. Robbins http://orcid.org/0000-0002-6037-7542

REFERENCES

Angwafo, T., & Chuo, M. (2016). Contributions of indigenous knowledge of gorilla (*Gorilla gorilla diehi*), chimpanzee (*Pan troglodytes ellioti*) and buffalo (*Syncerus caffer*) conservation, in Waindow, North West Cameroon. *Annual Research & Review in Biology*, *11*(2), 1–14. https://doi.org/10.9734/ARRB/2016/28428

Baker, J., Milner-Gulland, E. J., & Leader-Williams, N. (2012). Park gazettement and integrated conservation and development as factors in community conflict at Bwindi Impenetrable Forest, Uganda. *Conservation Biology*, *26*(1), 160–170. https://doi.org/10.1111/j.1523-1739.2011.01777.x

Bennett, N. J. (2016). Using perceptions as evidence to improve conservation and environmental management: Perceptions and conservation. *Conservation Biology*, *30*(3), 582–592. https://doi.org/10.1111/cobi.12681

Blomley, T., Namara, A., McNeilage, A., Franks, P., Rainer, H., Donaldson, A., & Infield, M. (2010). *Development and gorillas?: Assessing fifteen years of integrated conservation and development in south-western Uganda*. London, UK: International Institute for Environment and Development.

Breuer, T., Mavinga, F. B., Evans, R., & Lukas, K. E. (2017). Using video and theater to increase knowledge and change attitudes—Why are gorillas important to the world and to congo? *American Journal of Primatology*, *79*(10):e22692. https://doi.org/10.1002/ajp.22692

Chan, K. M. A., Balvanera, P., Benessaiah, K., Chapman, M., Díaz, S., Gómez-Baggethun, E., … Turner, N. (2016). Opinion: Why protect nature? Rethinking values and the environment. *Proceedings of the National Academy of Sciences of the United States of America*, *113*(6), 1462–1465. https://doi.org/10.1073/pnas.1525002113

Drury, R., Homewood, K., & Randall, S. (2011). Less is more: The potential of qualitative approaches in conservation research: Qualitative approaches in conservation research. *Animal Conservation*, *14*(1), 18–24. https://doi.org/10.1111/j.1469-1795.2010.00375.x

Estrada, A., Garber, P. A., Mittermeier, R. A., Wich, S., Gouveia, S., Dobrovolski, R., … Setiawan, A. (2018). Primates in peril: The significance of Brazil, Madagascar, Indonesia and the Democratic Republic of the Congo for global primate conservation. *PeerJ*, *6*, e4869. https://doi.org/10.7717/peerj.4869

Fairet, E. (2012). *Vulnerability to crop-raiding: An interdisciplinary investigation in Loango National Park, Gabon* (Unpublished doctoral dissertation). Durham University, Durham, UK.

Fossey, D. (1983). *Gorillas in the mist*. Boston, MA: Houghton Mifflin.

Ganas, J., Robbins, M. M., Nkurunungi, J. B., Kaplin, B. A., & McNeilage, A. (2004). Dietary variability of mountain gorillas in Bwindi Impenetrable National Park, Uganda. *International Journal of Primatology*, *25*, 1043–1072. https://doi.org/10.1023/b:ijop.0000043351.20129.44

Giles-Vernick, T., & Rupp, S. (2006). Visions of apes, reflections on change: Telling tales of great apes in equatorial Africa. *African Studies Review*, *49*(1), 51–73. https://doi.org/10.1353/arw.2006.0067

Gray, M., & Rutagarama, E. (2011). *20 years of IGCP: Lessons learned in mountain gorilla conservation*. International Gorilla Conservation Programme.

Hagemann, L., Arandjelovic, M., Robbins, M. M., Deschner, T., Lewis, M., Froese, G., … Vigilant, L. (2019). Long-term inference of population size and habitat use in a socially dynamic population of wild western lowland gorillas. *Conservation Genetics*, *20*(6), 1303–1314. https://doi.org/10.1007/s10592-019-01209-w

Head, J. S., Boesch, C., Makaga, L., & Robbins, M. M. (2011). Sympatric chimpanzees (*Pan troglodytes troglodytes*) and gorillas (*Gorilla gorilla gorilla*) in Loango National Park, Gabon: Dietary composition, seasonality, and intersite comparisons. *International Journal of Primatology*, *32*, 755–775. https://doi.org/10.1007/s10764-011-9499-6

Hemson, G., Maclennan, S., Mills, G., Johnson, P., & Macdonald, D. (2009). Community, lions, livestock and money: A spatial and social analysis of attitudes to wildlife and the conservation value of tourism in a human–carnivore conflict in Botswana. *Biological Conservation*, *142*(11), 2718–2725. https://doi.org/10.1016/j.biocon.2009.06.024

Hickey, J. R., Uzabaho, E., Akantorana, M., Bakebwa, I., Bitariho, R., Eckardt, W., …Zikusoka, G. K. (2019). *Bwindi-Sarambwe 2018 surveys: Monitoring mountain gorillas, other select mammals, and human activities*. GVCT, IGCP, and partners.

Hill, C. M. (2002). Primate conservation and local communities: Ethical issues and debates. *American Anthropologist*, *104*(4), 1184–1194. https://doi.org/10.1525/aa.2002.104.4.1184

Koehler, A. (2005). Of apes and men: Baka and bantu attitudes to wildlife and the making of eco-goodies and baddies. *Conservation and Society*, *3*, 407–435.

Leeds, A., Lukas, K. E., Kendall, C. J., Slavin, M. A., Ross, E. A., Robbins, M. M., … Bergl, R. A. (2017). Evaluating the effect of a year-long film focused environmental education program on Ugandan student knowledge of and attitudes toward great apes. *American Journal of Primatology*, *79*(8):e22673. https://doi.org/10.1002/ajp.22673

Malone, N., Wade, A. H., Fuentes, A., Riley, E. P., Remis, M. J., & Robinson, C. J. (2014). Ethnoprimatology: Critical interdisciplinarity and multispecies approaches in anthropology. *Critique of Anthropology*, *34*, 8–29.

Manfredo, M. J., Bruskotter, J. T., Teel, T. L., Fulton, D., Schwartz, S. H., Arlinghaus, R., … Sullivan, L. (2017). Why social values cannot be changed for the sake of conservation: Conservation values. *Conservation Biology*, *31*(4), 772–780. https://doi.org/10.1111/cobi.12855

Meijaard, E., Wich, S., Ancrenaz, M., & Marshall, A. J. (2012). Not by science alone: Why orangutan conservationists must think outside the box: Orangutan conservation. *Annals of the New York Academy of Sciences*, *1249*(1), 29–44. https://doi.org/10.1111/j.1749-6632.2011.06288.x

Namara, A., Gray, M., & McNeilage, A. (2000). *People and Bwindi forest: A historical account as given by local community members* (Unpublished report).

Oishi, T. (2013). Human-gorilla and gorilla-human: Dynamics of Human-animal boundaries and interethnic relationships in the central African rainforest. *Revue de Primatologie*, 1–35. https://doi.org/10.4000/primatologie.1881

Piccolo, J. J. (2017). Intrinsic values in nature: Objective good or simply half of an unhelpful dichotomy? *Journal for Nature Conservation*, *37*, 8–11. https://doi.org/10.1016/j.jnc.2017.02.007

Plumptre, A. J., Nixon, S., Kujirakwinja, D. K., Vieilledent, G., Critchlow, R., Williamson, E. A., Hall, … J. S. (2016). Catastrophic decline of world's largest primate: 80% loss of grauer's gorilla (*Gorilla beringei graueri*) population justifies critically endangered status. *PLoS One*, *11*(10):e0162697. https://doi.org/10.1371/journal.pone.0162697

Reibelt, L. M., Woolaver, L., Moser, G., Randriamalala, I. H., Raveloarimalala, L. M., Ralainasolo, F. B., … Waeber, P. O. (2017). Contact matters: Local people's perceptions of Hapalemur alaotrensis and implications for conservation. *International Journal of Primatology*, *38*(3), 588–608. https://doi.org/10.1007/s10764-017-9969-6

Remis, M. J., & Hardin, R. (2009). Transvalued species in an African forest. *Conservation Biology*, *23*(6), 1588–1596. https://doi.org/10.1111/j.1523-1739.2009.01290.x

Robbins, M. M., Akantorana, M., Arinaitwe, J., Kabano, P., Kayijamahe, C., Gray, M., Robbins, … A. M. (2019). Dispersal and reproductive careers of male mountain gorillas in Bwindi Impenetrable National Park, Uganda. *Primates*, *60*(2), 133–142. https://doi.org/10.1007/s10329-019-00718-z

Robbins, M. M., Gray, M., Fawcett, K. A., Nutter, F. B., Uwingeli, P., Mburanumwe, I., … Robbins, A. M. (2011). Extreme conservation leads to recovery of the virunga mountain gorillas. *PLoS One*, *6*, 19788. https://doi.org/10.1371/journal.pone.0019788

Robbins, M. M., Gray, M., Kagoda, E., & Robbins, A. M. (2009). Population dynamics of the Bwindi mountain gorillas. *Biological Conservation*, *142*(12), 2886–2895. https://doi.org/10.1016/j.biocon.2009.07.010

Seiler, N., Boesch, C., Mundry, R., Stephens, C., & Robbins, M. M. (2017). Space partitioning in wild, non-territorial mountain gorillas: The impact of food and neighbours. *Royal Society Open Science*, *4*(11), 170720. https://doi.org/10.1098/rsos.170720

Seiler, N., & Robbins, M. M. (2016). Factors influencing ranging on community land and crop raiding by mountain gorillas: Ranging and crop raiding on community land by gorillas. *Animal Conservation*, *19*(2), 176–188. https://doi.org/10.1111/acv.12232

Seiler, N., & Robbins, M. M. (2020). Ecological correlates of space use patterns in wild western lowland gorillas. *American Journal of Primatology*, *82*, e23168. https://doi.org/10.1002/ajp.23168

Setchell, J. M., Fairet, E., Shutt, K., Waters, S., & Bell, S. (2017). Biosocial conservation: Integrating biological and ethnographic methods to study human–primate interactions. *International Journal of Primatology*, *38*(2), 401–426. https://doi.org/10.1007/s10764-016-9938-5

Shutt, K. (2014). *Wildlife tourism and conservation: An interdisciplinary evaluation of gorilla ecotourism in Dzanga-Sangha, Central African Republic* (Unpublished doctoral dissertation). Durham University, Durham, UK.

Strindberg, S., Maisels, F., Williamson, E. A., Blake, S., Stokes, E. J., Aba'a, R.… Bakabana, P. C. (2018). Guns, germs, and trees determine density and distribution of gorillas and chimpanzees in western equatorial Africa. *Science Advances*, *4*(4), eaar2964.

Tagg, N., Maddison, N., Dupain, J., Mcgilchrist, L., Mouamfon, M., Mccabe, G., … Fa, J. E. (2018). A zoo-led study of the great ape bushmeat commodity chain in Cameroon. *International Zoo Yearbook*, *52*(1), 182–193. https://doi.org/10.1111/izy.12175

Tranquilli, S. (2016). The role of evidence-based conservation in improving primate conservation. In S. Wich, & A. Marshall (Eds.), *An introduction to primate conservation* (pp. 269–286). Oxford, UK: Oxford University Press.

Tranquilli, S., Abedi-Lartey, M., Amsini, F., Arranz, L., Asamoah, A., Babafemi, O., … Kuehl, H. (2012). Lack of conservation effort rapidly increases African great ape extinction risk: Conservation efforts prevent ape extinction. *Conservation Letters*, *5*(1), 48–55. https://doi.org/10.1111/j.1755-263X.2011.00211.x

Tumusiime, D. M., & Svarstad, H. (2011). A local counter-narrative on the conservation of mountain gorillas. *Forum for Development Studies*, *38*(3), 239–265. https://doi.org/10.1080/08039410.2011.610000

Tumusiime, D., & Vedeld, P. (2012). False promise or false premise? Using tourism revenue sharing to promote conservation and poverty reduction in Uganda. *Conservation and Society*, *10*(1), 15–28. https://doi.org/10.4103/0972-4923.92189

Vucetich, J. A., Bruskotter, J. T., & Nelson, M. P. (2015). Evaluating whether nature's intrinsic value is an axiom of or anathema to conservation: Nature's intrinsic value. *Conservation Biology*, *29*(2), 321–332. https://doi.org/10.1111/cobi.12464

Weber, B., & Vedder, A. (2001). *In the kingdom of gorillas*. New York, NY: Simon and Schuster.

Wich, S. A., & Marshall, A. J. (2016). *An introduction to primate conservation*. Oxford, UK: Oxford University Press.

Wrangham, R. W., & Ross, E. A. (2008). *Science and conservation in African forests: The benefits of longterm research*. Cambridge, UK: Cambridge University Press.

Yuliani, E. L., Adnan, H., Achdiawan, R., Bakara, D., Heri, V., Sammy, J., … Sunderland, T. (2018). The roles of traditional knowledge systems in orang-utan *Pongo spp*. and forest conservation: A case study of Danau Sentarum, West Kalimantan, Indonesia. *Oryx*, *52*(1), 156–165. https://doi.org/10.1017/S0030605316000636

How to cite this article: Robbins MM. Assessing attitudes towards gorilla conservation via employee interviews. *Am J Primatol*. 2020;e23191. https://doi.org/10.1002/ajp.23191