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Whale-Watching Management: Assessment of Sustainable Governance in Uramba Bahía Málaga National Natural Park, Valle del Cauca

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As the growth of the whale-watching activity increases rapidly around the world, the challenge of responsible management and sustainability also rises. Without suitable management, operators may try to maximize their own profits by breaking the rules, which may negatively affect cetaceans. In this paper, the applicability of conditions for sustainability governance in humpback whale-watching was evaluated. To achieve this purpose, semi-structured interviews were conducted in Uramba Bahía Málaga National Natural Park, Colombia. Results of this study showed that humpback whale-watching is characterized by unevenness in connections with markets, income inequality and the distribution of operators across several villages and cities. The combination of which restricts cooperation between operators. Nevertheless, there are informal agreements among the operators, and some operators are motivated to form associations. Besides, environmental entities have been responsible of regulation in lack of community-based management. However, this still does not achieve effective enforcement of the rules. Stakeholders (communities and government authorities) must mediate trust and reciprocity among operators to improve the situation. It is important to involve all operators to fill gaps in the limited government monitoring capacity and absence of sanctions. This is relevant to continue monitoring the evolution of the whale-watching in this and other Marine Protected Areas, so that the sustainability of the activity is not affected in the future.

Keywords: common-pool resources, management, humpback whale-watching, sustainability, Uramba Bahía Málaga National Natural Park, governance, case study, marine tourism

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INTRODUCTION

The whale-watching activity is a multi-billion-dollar business that is rapidly growing around the world (Senigaglia et al., 2016). However, the high costs of globally regulating marine ecotourism makes cetacean populations openly accessible for almost anyone, even inside Marine Protected Areas (MPA) (Lusseau, 2004; Moore and Rodger, 2010). Without oversight, tour operators drive their boats in ways that could negatively affect wild animals as a means to maximizing profits

(Higham et al., 2016). The negative impacts around whale-watching include changes in cetacean surfacing, acoustic and swimming behaviors that would reduce resting, foraging, traveling and socializing activities (Senigaglia et al., 2016). This could affect the viability of wildlife populations and hence the operators' future payoffs (Pirotta and Lusseau, 2015). Efforts to reduce the anthropogenic impacts are in the form of statutory regulations and voluntary codes of conduct or guidelines. However, neither of them ensure enforcement of the rules yet (Parsons et al., 2016; Parsons and Brown, 2017). The level to which operators comply with the regulations depends also on political, social, cultural, economic and environmental specific dynamics (Higham et al., 2009). To date, studies focusing on understanding relations between stakeholders within the whale-watching activity are still very few (e.g., Mustika et al., 2012, 2013; Dimmock et al., 2014; Heenehan et al., 2015; Silva, 2015). It is relevant to analyze sustainability governance with a case study, because of specific characteristics of the activity and heterogeneity of stakeholders for every place in the world (Yin, 2009).

Common-pool resource (CPR) theory was initially proposed as an attempt to solve the degradation of resources, by providing government or privatization solutions (Hardin, 1968). Recently, CPR theory has been applied to understand marine mega-vertebrate tourism management practices (Moore and Rodger, 2010; Pirotta and Lusseau, 2015) such as community-based regulations of whale-watching (Heenehan et al., 2015). In that sense, resource users have been seen as potential managers when they cooperate, self-organize, and create their own rules, to help govern resources sustainably (Ostrom, 1990). Therefore the knowledge of local communities are a key part in defining responsible resource use (Dimmock et al., 2014). In wildlife tourism, Moore and Rodger (2010) identified 30 enabling conditions of CPR management that will allow the sustainable use of resources (**Table 1**). The 30 conditions were grouped into four categories: (1) resource system characteristic, (2) user group characteristics, (3) institutional arrangements, and (4) external environment qualities that included technology, articulation with external markets, and the support of external entities (**Table 1**). Pairwise combinations of the first three categories were also explored. These conditions provided a comprehensive description of whale shark tourism at Ningaloo Marine Park, in Australia, and could be considered as a tool that may offer great potential in enhancing the sustainability of wildlife tourism. For this, more research using these conditions are needed.

Uramba Bahía Malaga NNP is considered the most important humpback whale-watching destination in Colombia, with 10,000 whale watchers in 2006 for a total revenue of $1,600,000 USD (O'Connor et al., 2009). It is also recognized as the main breeding ground of the humpback whale G stock on the Colombian Pacific coast (Avila et al., 2013). Management of Uramba Bahía Malaga NNP is highlighted in the country for having a joint management strategy. This means that the NNP's environmental authority works together with the Afro-Colombian community councils of La Plata-Bahía Málaga, Juanchaco, Ladrilleros, La Barra, Chucheros and Puerto España-Miramar (Parques Nacionales Naturales, 2019) (**Figure 1**). Since 1996, different

TABLE 1 | Moore and Rodger (2010) enabling conditions associated with sustainable wildlife tourism.

Enabling condition	Condition met in whale-watching
(1) Resource system characteristics	
(i) Small size	X
(ii) Well-defined boundaries	X
(iii) Low levels of mobility	X
(iv) Possibilities of storage of benefits from the resource	X
(v) Predictability	✓
(2) User group characteristics	
(i) Small size	X
(ii) Clearly defined boundaries	X
(iii) Shared norms	✓
(iv) Past successful experiences – social capital	✓
(v) Appropriate leadership – young, familiar with changing external environment, connected to local elite	X
(vi) Heterogeneity of endowments, homogeneity of identities and interests	X
(vii) Low levels of poverty	X
(1 and 2) Relationship between resource system and user group characteristics (industry)	
(i) Overlap between user group residential location and resource location	X
(ii) High levels of dependence by group members on resource system	X
(iii) Fairness in allocation of benefits from common resources	X
(iv) Low levels of user demand	X
(v) Gradual change in levels of demand	-
(3) Institutional arrangements	
(i) Rules are simple and easy to understand	✓
(ii) Rules that are adaptable and locally re-negotiable	X
(iii) Locally derived access and management rules	X
(iv) Ease of enforcement of rules	X
(v) Monitoring of resource, users and interactions (Ostrom, 1990; Ostrom, 1995)	X
(vi) Graduated sanctions	X
(vii) Availability of low-cost adjudication	X
(viii) Accountability of monitors and other officials to users	X
(1 and 3) Relationship between resource system and institutional arrangements	
(i) Matches restrictions on harvests to regeneration of resources	-
(4) External environment	
(i) Technology and markets	
Low-cost exclusion technology	X
Time for adaptation to new technologies	X
(ii) Low levels of articulation with external markets	X
(iii) Gradual change in articulation with external markets	-
(iv) State	
Central governments should not undermine local authority	X
Supportive external sanctioning institutions	X
Appropriate levels of aid to compensate local users for conservation	-
Nested levels of appropriation, provision, enforcement, governance	-

The conditions met in whale-watching at Uramba Bahía Málaga NNP, Colombia, were marked with a (✓), those absent with an (X) and unevaluated with a (-).

institutions have trained Bahía Málaga communities to raise awareness about responsible whale-watching (Trujillo and Ávila, 2013). In 2001, whale-watching guidelines were established with the scientific support of the ONG Fundación Yubarta and the governmental institutions: Dirección General Marítima (DIMAR) and Corporación Autónoma Regional del Valle del Cauca (CVC) (DIMAR, 2001). Regardless of these efforts, the rapid growth of the whale-watching activity has prevented attempts at control, thus generating potential negative effects on humpback whale populations, which may have long-term displacement impacts on them (Avila et al., 2015). Based on Moore and Rodger's 30 enabling conditions, the aim of this study was to characterize and analyze humpback (Megaptera novaeangliae) whale-watching in Uramba Bahía Malaga Natural National Park (NNP), Colombia. These conditions were applied to understand relationships between stakeholders and how this could benefit or affect sustainability practices.

MATERIALS AND METHODS

Ethics Statement

Ethical review and approval was obtained by the Ministry of Interior with the record number 0FI15-000029149-DCP-2500 12 August, 2015 according to local legislation and institutional requirements. The participants provided recorded informed consent to participate in this study.

Study Area

Uramba Bahía Málaga was declared a National Natural Park (NNP) in August 2010. It is located at the middle of the Colombian Pacific coast, 36 km North of Buenaventura city (**Figure 1**) (INVEMAR, 2006). In addition to the people who belong to the Afro-Colombian communities, members of other ethnic groups live in the area, such as indigenous and mestizo people (Arboleda, 1993). Social tourism in the NNP is one of the most important economic activities, followed by fishing, mining, forestry and hunting (Avila et al., 2015). Humpback whale-watching activities in this area began in 1994 by fishermen's boats in Bajos de Negritos – an area in front of Bahía Málaga (Trujillo and Ávila, 2013) (**Figure 1**). The city of Buenaventura and villages within the Bahía Málaga region (Juanchaco, Ladrilleros and La Barra) are the most important places for whale-watching in Colombia because they attract most of the whale-watching tourists in the country (Arias-Gaviria et al., 2011).

Data Collection

A total of 70 semi-structured interviews were conducted between October and November 2015, in the Juanchaco, Ladrilleros and La Barra communities, and Buenaventura's tourism dock. The aim of this semi-structured interviews was to obtain detailed data of situations, interactions, processes and perspectives of key actors (Aguirre, 1995). Questions were formulated from a selected set of topics to address the same issues and to collect the same information, according to each key actor (Bonilla and Rodri guez, 1997). Actors fell into the following categories: whale-watching operators, which included boat drivers and skippers (27 interviews); Buenaventura whale-watching companies' owners and administrators (3 interviews); dispatchers, which included company personnel in charge of accommodating tourists and authorizing and sending boats (3 interviews); hotel managers (23 interviews); and park officials, which included rangers and environmental interpreters trained by NNP to serve as naturalists and safety contacts (2 and 12 interviews, respectively). Only park officials were interviewed as local authorities since currently the NPP is the only official entity who is in charge for the management of the whale-watching activity in this area. In this paper, interviews with tourists were not conducted because the research focus was on the management of whale-watching actors.

Qualitative Data Analysis

Data analysis was done in ATLAS.ti 7 software. The interviews were coded by the following subjects: commercial whale-watching operations, networks among key actors, collaborative and competitive relationships, and conditions for sustainable management according to Moore and Rodger (2010) list (**Table 1**). Some conditions were not evaluated due to their lack of information and/or inapplicability to the species in consideration. Such conditions included: heterogeneity of endowments, gradual changes levels of demand, matches restrictions on harvests to regeneration of resources, gradual change in articulation with external markets, appropriate levels of aid to compensate local users for conservation and nested levels of appropriation, provision, enforcement, governance.

RESULTS

According to the list of 30 conditions for sustainability in the management of wildlife tourism provided by Moore and Rodger (2010), five conditions were not evaluated. This means that out of 25 conditions that were evaluated, twenty one (84%) were not met and only four (16%) were met in humpback whale-watching at Uramba Bahía Málaga National Natural Park (**Table 1**). Explanations of these results are described below.

User Group Characteristics and External Environment

User Group Characteristics

The operators were identified as users of the resource. Tourists must travel from the Buenaventura's tourism dock to the Juanchaco's tourism dock within the Marine Protected Area, to do whale-watching (**Figure 1**). Six authorized companies in the Buenaventura's tourism dock provide transportation and whale-watching services. The whale-watching trip can be a round trip, or tourists can lodge in Juanchaco or Ladrilleros, where there are local operators and branch offices of the Buenaventura companies. Some tourists travel to La Barra instead and, once there, are carried by local operators into the whale-watching area.

Different factors can contribute to or hinder the user's cooperation. Some operators have had successful experiences with local associations, which can contribute to social capital or cooperation with their prior knowledge (2iv, **Table 1**). Likewise, there are informal agreements to distribute the tourists between operators. These agreements are based in trust and reciprocity and allow rules of behavior by mutual agreement or shared norms

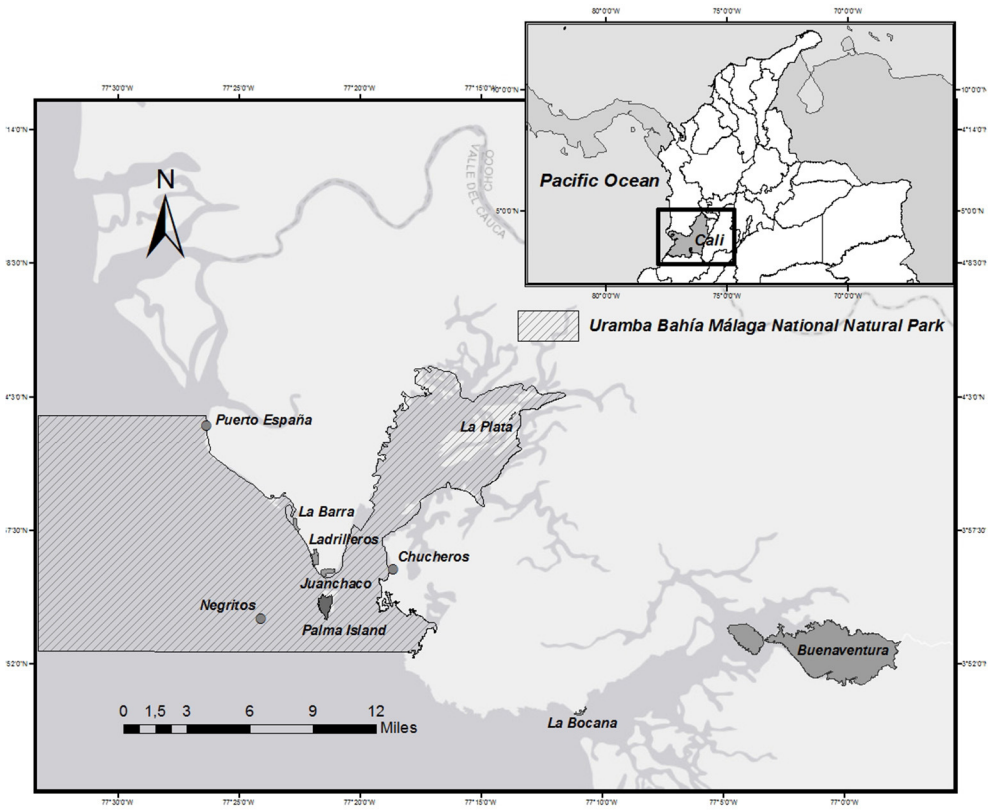

FIGURE 1 | Map of National Natural Park Uramba Bahía Málaga showing nearby villages and city of Buenaventura.

(2iii, **Table 1**). Occasionally, in Juanchaco's tourism dock, local operators make verbal agreements to distribute tourists by turns. They collaborate with each other in giving up and gathering enough tourists in a single boat. This avoids economic losses for boats that would otherwise leave with a low number of tourists and places the interests of the group over the individuals (Pretty, 2003). In La Barra, the low flow of tourists does not allow for distribution by turns. However, occasionally agreements are made when the number of tourists are too few to cover expenses. Those who cannot carry tourists, transfer them to another local operator that has the same or greater number of tourists. The ones whose boat is used can reward the operators who gave up their tourists by passing tourists to them later, by dividing the profits, or by giving them a small commission. Also, if someone has too many tourists at the same time, they will collaborate by talking with other local operators to take the extras, and sometimes receive a commission as a result.

There are also informal agreements or shared norms between Buenaventura companies (2iii, **Table 1**): an association of seven companies and a three-company alliance. The tickets are sold to tourists from several offices, but all those tourists are combined into the same boats until capacity is reached before another boat is filled. Depending on demand, the dispatch order changes when tourism decreases. During these times, the companies agree to send their boats in turns according to a predetermined list, and departure times become defined in three times a day. This prevents losses from carrying too few passengers on too many tours "...the fuel is very expensive, and we need to sustain the routine. It is necessary to make agreements..." (Company owner, Buenaventura).

Most operators are from different origins, but they generally have lived more than 10 years in the area. They have thus become part of the community councils and have at least 1 year of experience in whale-watching. This indicates that the operators have homogeneous identities (2vi, **Table 1**), sharing a common understanding of living situations, trust and a common interpretation of rules that allow for trust and reciprocity (Baland and Platteau, 1996; Ostrom et al., 2002).

External Environment

Markets

This study revealed that there are some problems with the whale-watching price. The price of a whale-watching trip in 2015 was ∼$8.30 USD (COP 25,000) per passenger per trip, plus the transportation cost of round-trip tickets from Buenaventura to Juanchaco, which were sold for $27.00 USD (COP 80,000). A competition-driven discounts given by whale-watching operators and intermediaries (see below) cause the prices to vary. The intermediaries are agents that connect the tourists with the operators as travel agencies, hotels, cabins, restaurants, or commission agents (**Figure 2**). Commission agents are independent persons who advertise whale-watching

to tourists and sell the tickets after negotiating with operators to reach an agreed upon price. Most of intermediaries work on commission. The Juanchaco and Ladrilleros hotels maintain informal agreements with local operators and Buenaventura companies, thus profiting when tourists pay for the service through their businesses. On the other hand, cabins and restaurants in La Barra connect tourists with local operators who may or may not be required to pay a commission to intermediaries.

According to testimonies of some local operators, sometimes the commission agents negotiate a lower price, which is an economic loss for the operator "…the commission agent never tells you how much he has charged..…there are some [commission agents] who want to pay $4.60 USD [per whale-watching trip], others $5.00 or $6.00 USD, because the passengers are paying for it cheap" (Boat driver, Juanchaco).

The price variability and connections with intermediaries affects informal agreements between operators in Juanchaco's tourism dock. Several of the interviewees referred to two local operators who had the greatest number of connections with Juanchaco and Ladrilleros hotels, gaining a large number of tourists. Therefore, the unevenness in articulation with markets generates income inequality (4ii, **Table 1**) (Ostrom et al., 2002). The operator's connections can range from working independently (no connections) to having many connections with hotels and travel agencies "…they [some operators] have agreements with hotels here, therefore if us who are independent do not have those agreements, what can we get? …" (Boat driver, Juanchaco). This unevenness, in how many connections each operator has, breaks informal agreements that contribute to fairness in allocation of benefits from the resource of whale-watching (1 and 2iii, **Table 1**). Some give up participation in agreements when they have the possibility to fill their boat to capacity. This creates an inequality of sacrifices willingly made by members of the community. Not all are willing to desist from income they may obtain individually for collective benefit (Ostrom et al., 2002). Other reasons that operators claim is that it has been impossible to organize themselves in Juanchaco's tourism dock because of the independent work of local operators. One interviewee said that "…until now that I know, not everything is independent, everything is individual" (Environmental Interpreter, La Barra). There is a general unwillingness to organize themselves and they lack a leader to form an association and persist in achieving it. Furthermore, no government or community entity has supported the creation of such an association, although one of the interviewees had sought to look for support from environmental entities, such as CVC. Therefore, the lack of competent operators with the necessary knowledge to establish government relations and to become respected local leaders with previous experience, makes it difficult to form an association (Baland and Platteau, 1996; Ostrom, 2009) (2v, **Table 1**).

Technology

There is a perception of economic disparity between operators from Juanchaco, Ladrilleros and La Barra and operators from Buenaventura (4i, **Table 1**). Buenaventura operators have primary access to tourists because of their opportunistic location (**Figure 1**). They also have advantages in boat capacity, between 20 and 46 passengers, with engines of 115, 150, or 200 horsepower (hp), and equipment compliance required by the marine authority. Instead, local boats are smaller with capacities between 4 and 25 passengers and engines of 15 to 40 hp. To transport tourists, all boat drivers must have a navigation license. The boat must comply with a large amount of required equipment according to DIMAR. When complying with the requirements, the authorized boat is allowed to be affiliated with an authorized company with a valid operating permit. However, local boats do not have equipment required by DIMAR and they are not affiliated with a company because "…most of the people here are low income…" (Boat driver, Juanchaco) or relative poverty (2vii, **Table 1**). However, most of the local boat drivers claim to have the necessary equipment for whale-watching: boats in good condition, life jackets for passengers, and two engines for one to be a back-up during whale-watching.

Even so, this heterogeneity of equipment and relative poverty is not shown to translate into a disadvantage for local operators. Most of the whale-watching tourists were managed by operators of Bahía Málaga communities in 2015 (Avila et al., 2015; Parques Nacionales Naturales Consejos comunitarios, 2015). There are informal agreements between Buenaventura companies and local operators of Juanchaco and Ladrilleros. These agreements are coordinated, respectively with dispatchers in charge of Buenaventura companies, in Juanchaco's tourism dock. The agreements occur when there are not enough Buenaventura companies' boats available or when the number of tourists is too low to cover the costs, using their large boats. These agreements allow local operators to have an access to those tourists who purchased tickets in Buenaventura. Therefore, there is no exclusion of benefits in terms of geographic location or variable equipment between users (4i, **Table 1**) (Baland and Platteau, 1996).

To deal with the problems of income inequality and price variation, some operators in Juanchaco's tourism dock have considered the possibility of starting a cooperative or microenterprise association. The association's plan would be to distribute trips in turns, no matter if the number of passengers is low for some trips. The association would also be the only entity that could sell whale-watching tickets in Juanchaco. The prices would be standardized, without intermediaries or Buenaventura companies intervening. Others suggest that local operators should handle most of the whale-watching trips. This will still allow Buenaventura companies to handle passenger transport to other sites.

Relationships Between Resource System and User Group Characteristics

Establishing an association with all whale-watching operators from different communities comes with other restrictions. Operators are scattered over a large area, so for some of them there is no overlap between their residential location and the prime whale-watching locations (1 and 2i, **Table 1**). Consequently, the geographical distribution of operators creates a barrier to forming relationships that could help establish and interpret the rules to support cooperation (Wade, 1988; Baland and Platteau, 1996). Besides, the operators depend in different

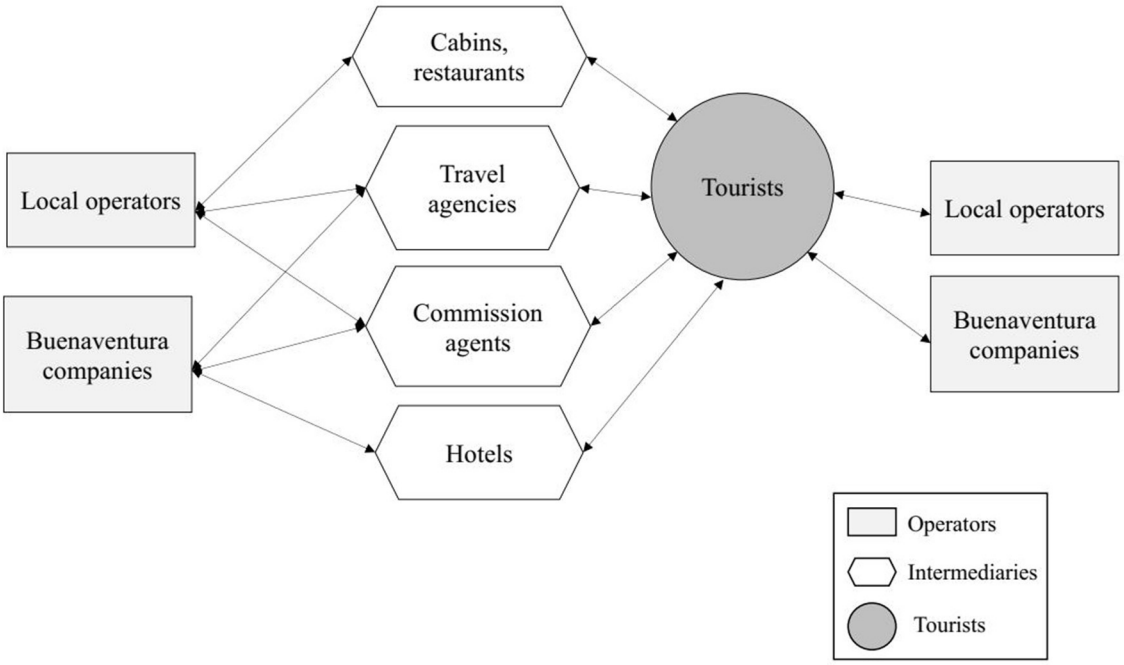

FIGURE 2 | Relations among key actors in the tourism chain of whale-watching, National Natural Park Uramba Bahía Málaga.

degrees on whale-watching (1 and 2ii, **Table 1**). Local whale-watching operators have other sources of income. These include serving as tour guides from other nearby attractions (for example, mangrove tours) and fishing. Boat drivers in Buenaventura are mainly dedicated to tourism and transporting passengers between villages as there are no roads between them, only two of them have other occupations "... after the whale-watching season... I do not have another activity that I can do, we used to fish, but now tourism is the main activity and we must wait for the next peak tourism season …" (Boat driver, Buenaventura). Some highlight the whale-watching season as the time when they have the highest income annually, and its advantage over other tours that take more time. Since the whale-watching tours are several times a day, it offers greater profits than other tourism activities that depend on tide level. In La Barra, whale-watching represents a fixed income as compared to other activities, such as fishing. However, most of the boat drivers in La Barra diminish the importance of whale-watching trips, because it is just an occasional service that occurs only during a season in the year. Therefore, the low dependence on the natural resource by some operators lessens the importance of the resource sustainability and therefore, generates an heterogeneity of interests (Baland and Platteau, 1996) (2vi, **Table 1**).

Resource System Characteristics and Institutional Arrangements

According to common pool resource theory, one of the most important conditions for successful management is the well-defined boundaries of the resource system and user group (1ii, 2ii **Table 1**). These prevent the arise of free-riders, i.e., individuals that can appropriate benefits without participate in collective actions or their behaviors can contribute to resource degradation (Ostrom, 1990).

In the study area, the environmental authorities have been responsible to establish boundaries on the resource system, user group, rules and monitoring actions (1ii, 2ii, 3iii, and 4v, **Table 1**). From 2001, with the development of guidelines, the CVC was responsible for enforcing them. At the beginning of each whale-watching season the "Local Interinstitutional Committee of Whales" in Buenaventura meets to plan the launch and to delegate commitments. Sometimes the committee meets at the end of the season to make an evaluation. Those who participate are the institutions and actors with environmental, political, social or cultural influence related to whale-watching. Since October 2010 with the establishment of Uramba Bahía Málaga as NNP, the NNP authorities were delegated to assume the whole responsibility of enforcing the guidelines and direct the committee (Ferrero-Ronquillo, 2015; Avila et al., 2015). The NNP holds seven contracts with local experts from six communities: Juanchaco, Ladrilleros, La Barra, La Plata, Chucheros and Puerto España-Miramar. It is "…one person for each community, except two from La Plata and, the councils of Chucheros and La Barra, which decided to assume the commitments of the local expert to contribute to the park team, the NNP coordinates some jobs with local experts and thus provides a salary …" (Park official, Ladrilleros).

Whale-Watching Guidelines

According to the committee, the operators should keep several requirements to participate in whale watching. Before the

whale-watching season starts, operators must attend a training workshop about whales, rules, and procedures provided by NNP, CVC and DIMAR. At the end of the training, they receive a whale-watching card that identifies them as authorized operators. Training workshops are conducted in Buenaventura, La Barra and Juanchaco. Workshops in Juanchaco are also attended by operators of other communities, such as Ladrilleros, Chucheros, La Plata and Puerto España (**Figure 1**). Once the whale-watching season officially starts, operators must report to the NNP authorities in Juanchaco's tourism dock or in La Barra, between 8 a.m. and 4 p.m. every day to obtain a trip authorization. To obtain the authorization, the participation in the training is verified. The park official or person in charge registers them and gives the operator a flag and one environmental interpreter. The flags are used as a sign to identify boats authorized for whale-watching and to confirm that operators know how to comply with all regulations.

The occurrence of "environmental interpreters," as they are currently known, emerged in 2011 as an initiative of NNP with local communities during the committee. Before the whale-watching season, NNP authorities, with the support of other entities, train young persons from the local communities in on different aspects about the surrounding territory, marine mammals and other local species, and on how to carry out responsible tourism in the Bahía Málaga ecosystem (Vásquez, 2015). To limit the number of boats on the sea (2i, 2ii, **Table 1**), a maximum of 15 flags are distributed at any given time. Meaning that only 15 boats at a time can be doing whale-watching. Additionally, tourists are supposed to be given an informative talk on land, before departure, about the protected area, the whales, and recommendations for whale-watching in the facilities where the park officials are located. The talk can be given by park officials or environmental interpreters.

Application of Whale-Watching Guidelines

Regarding rules, most of the operators report that the guidelines are easy to understand and apply (3i and 3iv, **Table 1**). Some operators, though, mentioned that certain rules about keeping a safe distance from the whales were difficult to apply. This is because there are times when groups of whales, most of them with calves, will approach boats closer than 200 m on their own. The boats cannot reasonably move away in order to abide strictly by the rules. Therefore, the rules do not adjust to local conditions, since Bahía Málaga is characterized as a breeding area (Avila et al., 2013) (3ii, **Table 1**). Besides, most operators interviewed say they understand the rules and commit to following them before every whale-watching season. However, several key actors admitted to not trusting others' compliance of the rules. Relations of trust could contribute with monitoring when individual trusted each other to act as they should (Pretty, 2003).

More important, even if the operators agree to comply with the rules, they will not be fulfilled if nobody invests in monitoring and sanctioning activities (Ostrom, 1990). Park officials are currently the entities that have been in charge of monitoring enforcement at sea (3v, **Table 1**), with some support from the CVC, the Navy-Coast Guard and environmental interpreters. The environmental interpreters serve as supervisors for monitoring boat equipment and capacity (passenger overcrowding) and ensuring that the whale-watching rules are adhered to on board. Moreover, if it is necessary, they give a warning to the boat driver or make a note to report bad behavior to the NNP. Nevertheless, their verbal warnings, as a means of enforcement, is perceived by the operators as having low authority. In addition, some operators, mainly from Buenaventura, Juanchaco and Ladrilleros, tend to supervise each other as a result of by-product of using the commons (Ostrom, 1990) (3viii, **Table 1**). They scold each other personally at sea or later on land, particularly when someone is too close to the whales. Only a few of those incidents are later reported to park officials. However, some mentioned that, when doing these actions, they generate conflict and are called "toads" (a slang word for gossips or "tattle tales") by their peers. However, despite the efforts to establish clearly defined boundaries of user group (2i, 2ii, **Table 1**) and monitoring actions, there are still gaps. In La Barra, one of the operators interviewed in the community did not attend the trainings and therefore was not granted the whale-watching card. Several other interviewees even mentioned that operators would give whale-watching trips without the training and a flag. Nor did most of the local operators take an environmental guide with them or give the pre-departure talks to tourists. In La Barra, this is likely due to the fact that the environmental interpreter training began in 2015. In the same year, the flags and report about operators started to be recorded and delivered in La Barra by environmental interpreters. When park officials find an unauthorized boat, they can request the suspension of the whale-watching activity and ask them to go to the Juanchaco's tourism dock. Once on land, other park officials give the operator a small talk if he did not participate in the training workshops in order to provide him with a flag and an environmental interpreter. On the other hand, if a boat breaks a rule of whale-watching, the boat driver will receive a verbal warning by environmental authorities (NNP or CVC) and it is recorded as a note. After the whale-watching season ends, all recorded notes are discussed in the "Local Interinstitutional Committee of Whales" to consider whether sanction measures are necessary. The existence of unauthorized operators in the sea may derive from the characteristics of the humpback whale habitat that raise the costs of defining boundaries, monitoring and knowledge of the state of the resource (Wade, 1988; Ostrom, 2009) (1i,1ii, and 1iii, **Table 1**). Nonetheless, most of the boats leaving from Buenaventura, from areas surrounding the Park, and from the communities that are part of it, do whale-watching near of Juanchaco's tourism dock in Bajos de Negritos (**Figure 1**), where there is the highest probability of observing whales. This natural congregation facilitates monitoring and set boundaries (3v and 1ii, **Table 1**). Also, the profits are ensured every year by the high predictability of the arrival of humpback whales for their reproductive season (1v, **Table 1**).

Sanctions

According to testimonies from park authorities, there are not currently sanctions concerning whale-watching (3vi, **Table 1**). However, there were some inconsistences between the guidelines and testimonies from environmental authorities

and some boat drivers. The guidelines specify legal sanctions to those who do not comply with recommendations of whale-watching. These are considered as infractions to naval rules (DIMAR, 2001). Some boat drivers claimed the existence of sanctions such as suspensions of whale-watching for days or all season, economic fines, jail time, and retention or immobilization of the boat. Moreover, several key actors recognized the importance of establishing sanctions (3vi, **Table 1**) to enforce compliance "…because it would be good, because [then] people would always respect the rules …" (Boat driver, Juanchaco).

DISCUSSION

The aim of this study was to analyze the characteristics of humpback whale-watching in Uramba Bahía Malaga National Natural Park through Moore and Rodger (2010) 30 enabling conditions for sustainability of governance. Since only 16% of the conditions were met, current management of the whale-watching activity in the area could jeopardize sustainability of governance in the mid- and long-term. Conflict and competition among operators, the unwillingness to work together, the lack of a whale-watching operators' association, and the lack of support from government organizations appear as some of the main reasons for this lack of sustainability. These issues have also been identified in whale-watching industries in the Azores (Bentz et al., 2013; Silva, 2015). This suggests that some problems identified in this study could be occurring in different regions of the world. It is important to notice also that these problems have not hindered the informal agreements between different key actors and operators to share tourists or to share information about the location of whales. Interestingly, this has also been observed in other regions of the world (Silva, 2015).

Moreover, some recommendations arise from these analyses. To tackle these social problems and the perception of a lack of enforcement in humpback whale-watching at the Uramba Bahía Málaga NNP, it is necessary to have joint management support by involving stakeholders, local communities, operators, and government entities (Higham et al., 2009; Dimmock et al., 2014; New et al., 2015). Local operators could participate in the development of local guidelines. This could help to develop rules on specific behaviors that should be adapted when humpback whales are nearby (Ostrom, 1990; Gjerdalen and Williams, 2000). Local councils and individuals with previous experience in similar associations could assist in conflict resolution to promote trust and reciprocity among operators during activities by implementing regular meetings (Young, 1999; Heenehan et al., 2015). Several studies have also shown that it is possible to equally distribute benefits of whale-watching and to foster cooperation to resolve disagreements and consolidate competition by forming local associations (Young, 1999; Allen et al., 2007; Mustika et al., 2012). This could also help the operators to be recognized as a legitimate voice in whale-watching management (Lawrence et al., 1999).

It is important to empower environmental interpreters by bolstering their perceived low authority. This would improve surveillance mechanisms. Tourists could also monitor and report bad behaviors during whale watching. The most effective sanctions and monitoring methods applied by the authorities or by the operators themselves should also be identified. Furthermore, if the authorities seek to limit the number of operators in the future, the operators' opinion should be considered. Those who do not agree with limiting the number of operators state that officials "…cannot deny our right to work unless they have subsidies to carry out the activity…" (Boat driver, Juanchaco). In this way, limiting the number of operators should be complemented by policies to reduce poverty levels (Mustika et al., 2012).

CONCLUSIONS

The CPR analysis of humpback whale-watching based on enabling conditions for sustainability governance developed by Moore and Rodger (2010), revealed the complexity of the system. Only external entities define the boundaries and rules of local management of the resource system, user group and institutional arrangements. In addition, the high cost of surveillance, which derives from the characteristics of the resource system, prevents to adequately monitor the compliance of the rules. The analyses showed also that sustainability governance of the whale-watching activity may be in jeopardy in the mid- and long-term since only some of the conditions were met. Government and community authorities have the challenge to improve the relationships between stakeholders and to better control the local agreements and price of the activity. Regular meetings between operators may resolve social problems, and inconsistences in rules and sanctions. The creation of operator associations could lead to socioeconomic equality and enhance their participation in whale-watching management. Difficulties in monitoring could be reduced in the future if operators really considered environmental interpreters as authority officers. Through informative talks, tourists could also get involved in monitoring and could report bad behaviors during whale watching.

Moreover, in whale-watching areas in which only the biological approach has been prioritized, it is advisable to apply the methodology presented here. This could allow to deepen in other factors that may be affecting the sustainability of the whale-watching industry. Further researches on humpback whale-watching as a "tragedy of the commons" in Colombia and in other regions of the world are also needed. This will help to better understand the relationships between each of the conditions to enable sustainability governance and to identify cases of management failure but also of cooperation success between key actors.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was obtained by the Ministry of Interior with the record number 0FI15-000029149-DCP-2500 12 August, 2015 according to local legislation and institutional requirements. The participants provided recorded informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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