sociedade & natureza

DOI: 10.14393/SN-v34-2022-64289
Received: January 18, 2022 | Accepted: June 06, 2022 | Published: June 30, 2022

Papers

What is the role of volunteer work in protected areas? A case study in Brazil

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Keywords:
Conservation
Public policies
Neoliberal conservation

Abstract
Currently, protected areas around the world have a demand for volunteer work. At the same time, people in several countries that house protected areas seek out these spaces to serve as volunteers. This process occurs in a scenario strongly influenced by the neoliberal economy, which is marked by cuts in environmental management budgets and increased protected areas visitation. Based on this context, the objective was to analyze the role of volunteer work in protected areas in the context of neoliberal paradigm predominance. For this purpose, it was established a current overview of volunteer activity through a case study in Brazil by collecting information from volunteers and managers, heads or managers of protected areas receptive to volunteer work in interviews using structured questionnaires. It was found that Parques Nacionais are the categories with the greatest demand for volunteer work. It was also found the most part of volunteers is between 20 and 30 years old, and their education level is higher education in undergraduate courses related to biological sciences. It was identified significant differences between the perceptions of managers and volunteers about volunteer work objectives. However, both groups indicated that "Environmental education/environmental interaction and interpretation" and "Support for visitation" are the most frequently performed activities, and the main form of support and trade-off for volunteer work is the offering of certificates. Thus, volunteer work seeks to contribute to the protected areas objectives by supporting the management of these areas during public use activities. However, in the current scenario, this work is palliative in the face of the impacts of the dismantling of environmental policy that affects most countries that have Protected areas and have surrendered to neoliberal conservation.

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INTRODUCTION

Volunteer work (VW), in its genesis, is related to humanitarian actions taken to help others, as the first Christian churches did through donations to the needy and sick (KISNERMAN, 1983; HUDSON, 1999). Currently, volunteering can be defined as an attitude to perform work that is unpaid and not mandatory that aims to benefit another person, group or organization, and the environment (PAGÈS; FISCHER; WAL, 2017). In Brazil, it is legally defined as "nonremunerated activity provided by an individual to a public entity of any nature or to a private nonprofit institution that has civic, cultural, educational, scientific, recreational or personal assistance objectives" (BRASIL, 1998).

Protected areas (PA), is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (DUDLEY; STOLTON, 2010). These areas have a growing demand for VW that may be related to two main factors: cuts in public budgets for conservation and increased visitation to protected natural areas (SILVEIRA-JUNIOR et al. 2019). The first one may put the natural areas of several countries, such as the United Kingdom (CARR, 2002), Canada (SAVAN et al., 2003), Australia (ABRAHAMS, 2005) and the United States of America (BRUYERE; RAPPE, 2007), at risk. Increased visitation requires greater attention from managers and a greater amount of human resources to support various activities, such as management, monitoring and public use – Environmental education and interpretation, tourism and research (RYAN; KAPLAN; GRESE 2001; SAVAN et al. 2003; BRUYERE; RAPPE 2007; MEASHAM; BARNETT, 2008). The two factors underlying the need for VW at Protected Areas (PAs) are related to trends imposed by the neoliberal economy to reduce the size of the state and outsource PA management functions (HOLMES; CAVANAGH, 2016), which makes the management of PAs unfeasible (SOARES et al. 2020).

Additionally, to create new markets and products, as many PAs are transformed, especially those that have tourist attractions (SEGI, 2014). In this scenario, neoliberal conservation emerges, which can be conceptualized as "a complex and multifaceted trend, characterized in large part by the emergence of practices and discourses of financialization, commodification, privatization, and decentralization of conservation governance" (HOLMES; CAVANAGH, 2016).

On the other hand, many people are mobilizing to perform VW in PAs; they are motivated by several factors, such as "caring for and saving the environment, learning from volunteer work" (BRUYERE; RAPPE, 2007); "affection for the place, willingness to contribute to the community, search for social interaction" (MEASHAM; BARNETT, 2008; HALPENNY; CAISSIE, 2015); "willingness to contribute to the prevention of global warming; to contribute to traditional cultures; and to the economic revitalization" (TAKASE et al., 2018).

In Brazil, the situation seems to be more serious, as the number of PAs has increased along with the increase in visitation and also with the cuts in the budget for environmental management. The federal resources allocated annually to Conservation Units – a type of Brazilian protected area that corresponds to the categories of the International Union for Conservation of Nature - IUCN (PELIZZARO et al., 2015) stabilized at approximately US$ 6.309.000.000,00 between 2001 and 2010. On the other hand, the number of PAs increased 83.5% during this period, which represents a 40% reduction in the amount of resources per federal protected hectare during this period (MEDEIROS et al., 2011). In 2019, the amount spent on conservation and preservation was reduced to US$ 30.92.793.912,80 (BRASIL, 2020). The aggravating factor is that the number of visitors to Brazilian PAs has increased every year, quadrupling in the last decade (MMA 2020).

In Brazil, there are two additional aggravating factors: the large territorial extent of the country and its PAs (ICMBio 2012; ICMBio 2014) and the large number of PAs – 1. 702 *uso sustentável* , where the sustainable use of natural resources is allowed (corresponding to categories IV, V and VI of the IUCN) and 798 *proteção integral*, where only indirect use of natural resources is allowed (corresponding to categories Ia, Ib, II, III of the IUCN) (MMA 2022).

In this context, in which the neoliberal economy influences the environmental public policies and environmental management budgets of countries that have PAs, with consequences that threaten worldwide conservation objectives, such as the lack of all types of resources associated with increasing visitation, and since VW is increasing in these scenarios, it is important to understand the role of VW in PAs. It is important to point out that budget cuts for conservation are opposed to the sustainable development goals (SDGs),

especially “SDG 13” and “SDG 15”, which were established by United Nations General Assembly resolution 70/1: "Transforming our world: the 2030 Agenda for Sustainable Development" (UNITED NATIONS 2015).

This study sought to answer this question through a case study in Brazil that gives voice to those who participate/participated directly in the activities; that is, by listening to volunteers who have worked in a Brazilian PA and experienced VW in practice and to the managers, heads and those responsible for the PA who plan volunteer activities and receive, train and monitor the volunteers at work.

This study stablished an overview of how VW in PA in Brazil is perceived by the social actors involved to evaluate the role of volunteer work in protected areas in the current scenario of neoliberal paradigm predominance. Based on this overview, this study had as objective to answer the following questions: In which types of protected area management categories is volunteering conducted in Brazil? What is the level of education of the volunteers? Which academic areas and courses motivate these volunteers? What are the main activities performed during VW? What trade-offs and support do the volunteers receive for their work? What are the objectives of the volunteer program in which the study participants are involved?

Another aspect that needs to be highlighted is that this study does not aim to assess the effectiveness of PA management, which has already been carried out by other researchers, using different approaches (BELOKUROV et al. 2009; JENKINS; JOPPA 2009; LEVERINGTON et al. 2010) A widely used technique is the Rapid Assessment and Prioritization of Protected Area Management (RAPPAM), which makes it possible to identify trends and aspects that should be considered to improve the management of a PA or PA system (ERVIN, 2003). Given the present context, in which VW is characterized as an activity of great importance for the conservation of biodiversity and geodiversity, supporting ecosystems, there is a hope from these analyses to obtain insights that can improve the efficiency of volunteer activities.

MATERIALS AND METHODS

Data collection

Data collection occurred between May and November 2019 through structured questionnaires administered to volunteers and former volunteers from PAs and to managers in federal PAs. The volunteers were contacted for participation through a campaign that publicized the research on social networks (Facebook, Instagram and WhatsApp) in pages, groups and communities related to conservation and volunteering. During this process, the volunteer contacted the research committee and was asked to answer a structured questionnaire containing questions related to the volunteer activity he or she performed. The questionnaire was sent by e-mail or other digital medium of the participant’s choice (supplementary material). At the end of the questionnaire, the participant was asked to indicate other people who had volunteered at federal PAs who could contribute to the research according to a heterogeneous sample composition strategy called snowball sampling (ALBUQUERQUE et al., 2014). Participant selection ended when no more new participants were recommended (saturation point). To select which federal PAs would comprise the study, was chose those that declared that they were open to VW on the institutional website of the *Instituto Chico Mendes de Conservação da Biodiversidade* (ICMBio 2022), which is the federal agency responsible for the management of Conservation Units in Brazil

To administer the questionnaire to managers, 102 PAs were selected and were sent a structured questionnaire through a Google digital form, with instructions that the questionnaire should be completed by the manager, head and/or person responsible for VW at the Conservation Unit. Thus, the federal PAs involved in this study were represented by both VWs and managers or by only one of the two groups.

The questionnaire that the volunteers and managers completed was divided into two parts. The first collected information on the socioeconomic profile of the volunteer, such as age, gender, and educational level. The choice of these variables influenced the methods and techniques at the *Instituto Brasileiro de Geografia e Estatística* (IBGE), which is the federal agency responsible for the analysis and dissemination of data and information about society, economy and living conditions of the Brazilian population.

In the second part, was investigated the VW, using the research of Silveira-Junior *et al.* (2019) as a reference for VW in Brazil; based on this reference, was determined a list of possible objectives, volunteer activities and trade-offs and support offered. So, there was asked the participants about the objectives of the volunteer activity by presenting a list of nine objectives that the respondents scored on a scale from 0 to 9, in higher values indicated greater relevance of the objective. This scale was used based on Saaty (2008) "Analytic Hierarchy Process" (AHP), in order to obtain significant differences between the two segments, since more items favor better discrimination and data analysis (COELHO; ESTEVES 2007). The objectives were "Obtain human resources", "Provide practical experience", "Support participatory PA management", "Environmental education and work interpretation", "Assistance in promoting the PA", "Assisting with PA visitation", "Help with management", "Support for scientific research" and "Firefighting".

In addition, the participants indicated the activities that they performed during their volunteer period at the PA on a list of 10 pre-established activities. The participants were able to indicate more than one activity, and there was also an "other" option to allow the participants to add activities other than those presented. There were suggested 10 activities: "Support for visitation", "Environmental education/environmental interaction and interpretation", "Monitoring", "Management", "Research support", "Administrative", "Infrastructure", "Fire support", "Firefighting" and "First aid". Finally, was performed the same procedure to determine the trade-offs offered to the volunteers by the PA teams. For this purpose, was offered a list of five trade-off options, on which the participants could select more than one option. The suggested trade-offs were "Obtaining a certificate", "Housing", "Food", "Capacitation", "Transportation" and "Personal protective equipment". An "other" option was included so that the participants could indicate trade-offs other than those suggested, and the option "None" was provided for situations in which no trade-off was offered by the PA team. The PA managers were asked to answer the same questions presented in the same manner that they were applied to the volunteers, except for the questions related to capacitation.

Analysis

From the data obtained from the two groups, initially was evaluated the characteristics of the places where the volunteer activity occurs, for example, by categorizing the activities according to the political regions of Brazil and according to the type and category (*proteção integral* or *uso sustentável*) of the PA, as predefined in the *Sistema Nacional de Conservação da Natureza* (SNUC), (BRASIL, 2000), management system responsible for the implementation of Brazilian conservation units. Next, was categorized the volunteers according to their age and educational level by group and evaluated their training in terms of categories of knowledge. To identify the major areas of knowledge, the classification criteria adopted by CAPES (in portuguese *Coordenação de Aperfeiçoamento de Pessoal de Nível Superior*), the federal public foundation that promotes and maintains the quality of human capital involved in scientific research and education (BARATA et al., 2014).

Next, it was evaluated the existence of differences in the perspectives of managers and volunteers regarding the relevance of each of the nine objectives. For this purpose, t was used ordinal logistic regressions (LIU; ESTEVES, 2012), in which the ordinal score of each objective was considered a response variable and the actor involved (manager vs. volunteer) was included as an explanatory variable. It was adopted the *logit* link function (BOLKER et al., 2009). The models were then subjected to a post-hoc least squares means test (LSmeans) (LENTH, 2018) to estimate mean scores and obtain the significance of the comparison, with 0.05 as the significance level. Finally, it was evaluated the frequency of citation of the activities and the presence of trade-offs from the perspective of volunteers and managers based on the total number of participating volunteers (% of total volunteers) and the number of managers (% of total managers).

RESULTS

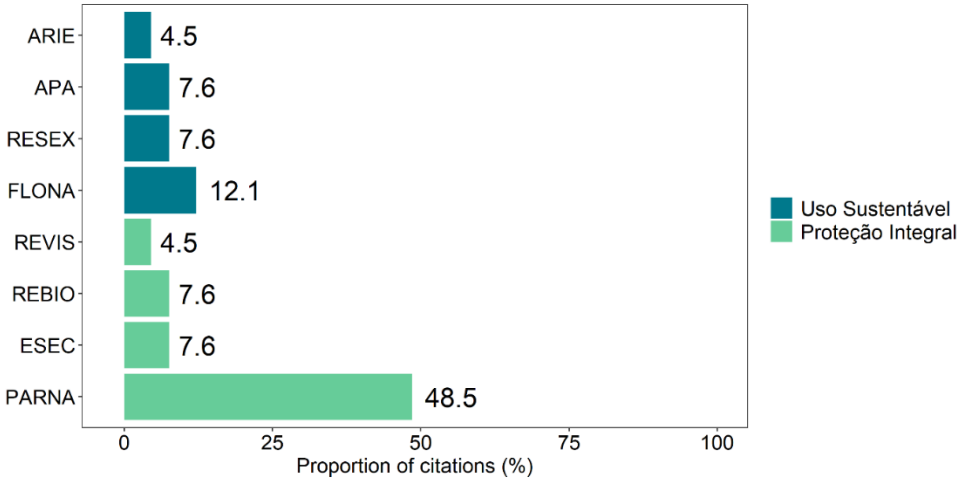
In total, there were 237 volunteers, and 40 managers representing the management of eight categories of PAs in the five regions of Brazil (Figure 1).

Figure 1 - Map of localization of protected areas cited by volunteers and managers in Brazilian states and political regions; 69 PAs.

Notes: Área de Relevante Interesse Ecológico (ARIE) – Area of Relevant Ecological Interest; Reserva Biológica (REBIO) – Biological Reserve; Área de Proteção Ambiental (APA) - Environmental Protection Area; Estação Ecológica (ESEC) – Ecological Station; Reserva Extrativista (RESEX) – Extractive Reserve; Floresta Nacional (FLONA) – National Forest; Parque – Park; Refúgio de Vida Silvestre – Wildlife Refuge; Brasil – Brazil.
Source: The authors (2022).

A total of 69 PAs were represented. Of these, parks accounted for most of the VW (48.5%), followed by national forests, with 12.1% (Figure 2); the other PA categories had considerably values lower than 10%. The four Parques Nacionais with the highest volunteer activity, Chapada dos Veadeiros (state of Goiáis), Caparaó (states of Espírito Santo and Minas Gerais), Itatiaia (state of Rio de Janeiro) and Chapada dos Guimarães (state of Bahia), corresponded to about half of all activities reported by the volunteers. This result indicates the predominance of *proteção integral* PAs (68.2%) over *uso sustentável* PAs (31.8%).

Figure 2 - Graph of proportion of protected areas (%) from each conservation unit category in Brazil.

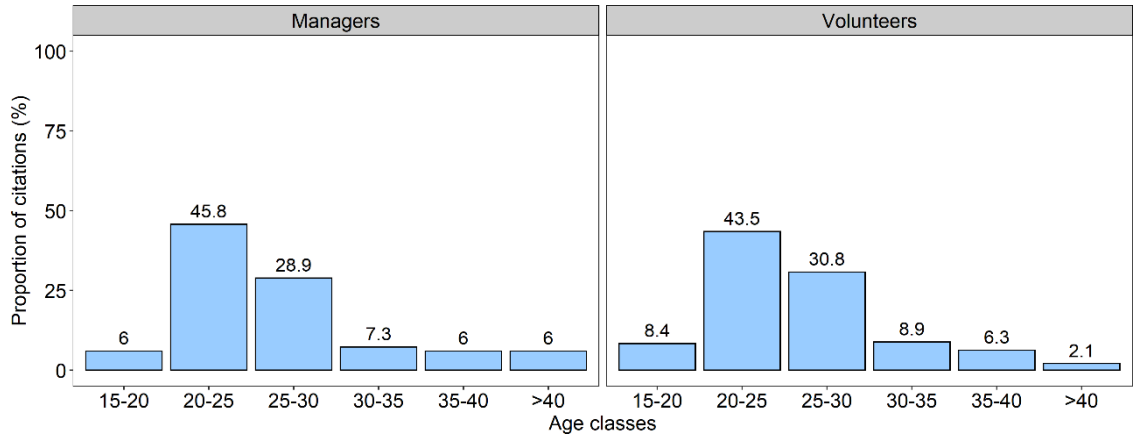


Notes: Uso Sustentável (Sustainable use) and Proteção Integral (Integral Protection)
Source: The authors (2022).

According to the two perspectives (volunteers and managers), more than 70% of the participants were been involved in volunteer activity at the ages of between 20 and 30 years

old, but 20 to 25 years old group predominated, with more than 40%, followed by the 25 to 30 years old group, with 30% (Figure 3).

Figure 3 - Graph of number of volunteers at Brazilian PAs sampled in this study according to age group, for the perspective of managers (left figure) and volunteers (right figure). N equals to 237 for volunteers and equals 40 for managers.



Source: The authors (2022).

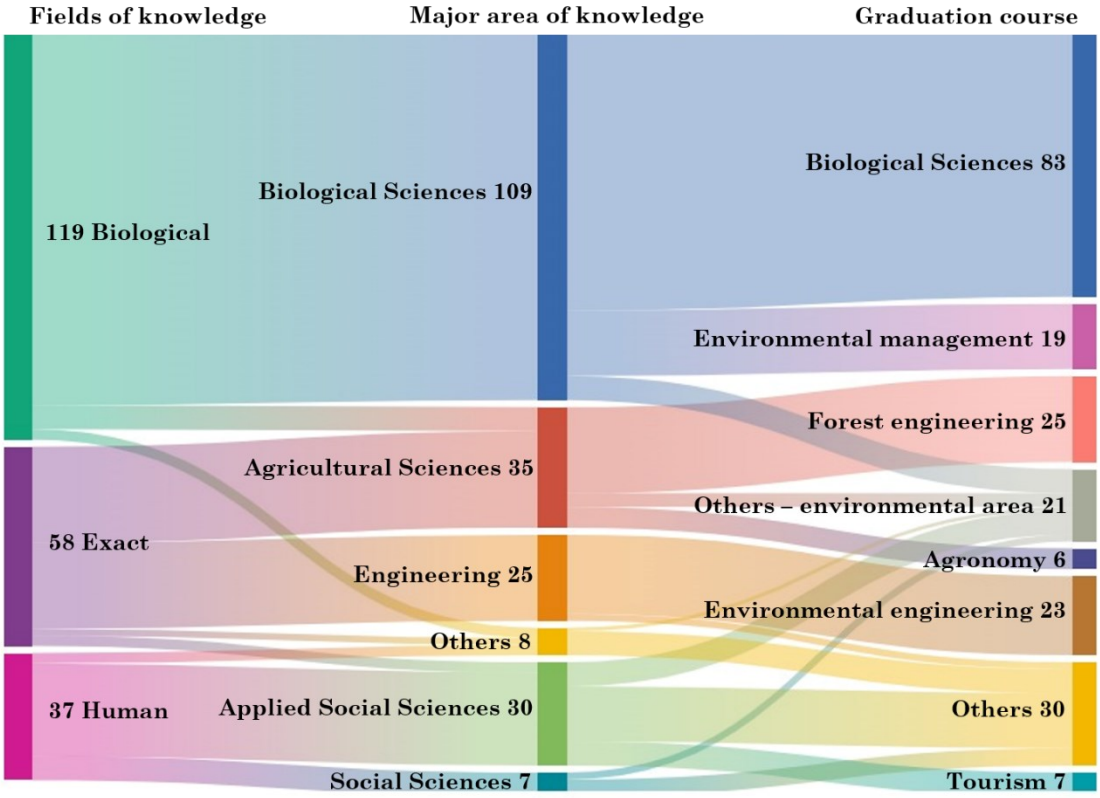
The 237 participants in volunteer activities in the PAs had educational levels ranging from elementary school to graduate school, but according to both the volunteers and the managers, undergraduate education predominated, comprising more than half of the total according to the managers and more than 80% according to the volunteers (Figure 4).

Figure 4 - Graph of volunteers in Brazilian PAs sampled in this study by education level, from the perspective of managers (left figure) and volunteers (right figure). N equals to 237 for volunteers and equals 40 for managers.

Source: The authors (2022).

Of the 237 volunteer activities performed by undergraduate and graduate students, 228 (96.2 %) corresponded to a course the participant was attending or had completed, and 77.6% (184, counting the volunteers that described the course) of these were undergraduate courses in areas that traditionally act directly in the conservation of natural areas. Most of the attended courses were in the area of biological sciences, as indicated by 35.02% (83) of volunteers. The most cited area of knowledge among the volunteers was biological sciences, with 55.6% (119) (Figure 5).

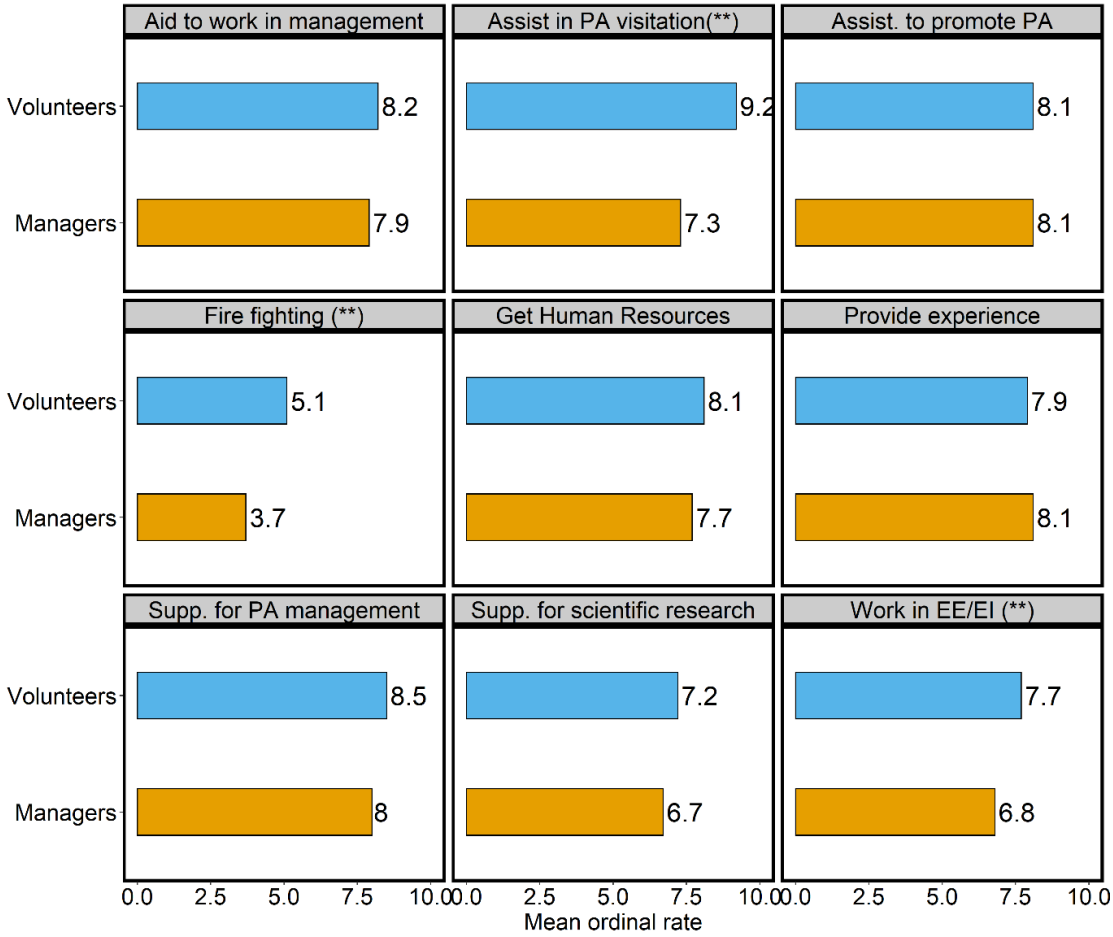
Figure 5 - Relationship between knowledge areas and undergraduate courses cited by volunteers.



Source: The authors (2022).

Regarding the objectives of VW, was observed significant differences ($p<0.01$) between the views of the managers and the volunteers (Figure 6). For the objectives "Assistance with visitation", "Firefighting" and "Environmental education/environmental interpretation", the volunteers indicated greater relevance than the managers did. For the other objectives, the two groups indicated similar relevance. However, the objectives "Assistance with visitation" and "Support for PA management" stood out because the sum of the values indicated by the two groups of social actors reached a high average of 8.25%. These two objectives also stood out because they obtained high scores; the first objective was indicated as the most important by the volunteers, and the second was indicated as most important by the managers.

Figure 6 - Mean relevance scores for each objective of volunteer activity from the perspectives of the volunteers and the managers.



Note: Objectives followed by (**) show significant differences between the two groups according to the LSmeans test at the 5% significance level. PA: Protected areas; Assist: Assistance; Supp: Supporting; EE/EI: Environmental Education/Environmental Interpretation. Although scores in questionaries are given from 0 to 9, means may be higher than 9 since may there be most values in the higher portion from the values range.
Source: The authors (2022).

The classification of the activities performed in VW in PAs showed that some were more frequently performed, as indicated by a large percentage of managers and volunteers. These frequently performed activities included “Environmental education/environmental interaction and interpretation”, “Support for visitation”, “Monitoring”, “Research support”, "Management" and "Administrative". However, there were disagreements between the two groups of social actors regarding the order of importance of the most mentioned activities: according to the volunteers, “Support for visitation” activities were the most frequently performed activities, while according to the managers, “Environmental education/environmental interaction and interpretation” were the most frequently performed activities, although the volunteers attributed higher values to this activity than the managers did. Was identified a greater balance of values among the four main activities in the responses of the PA managers than in the responses of the volunteers, who presented discrepant values for the two main activities, "Support to visitation" and "Environmental education/Environmental interaction and interpretation", compared to the other activities.

When was compared the classification of volunteer activities reported by the two groups of social actors, there was found that the managers reported that “Firefighting” is the most frequent activity, while the volunteers indicated “Support for visitation” as the most frequent activity.

Regarding the trade-offs and support offered to the volunteers, there were practically no discrepancies, especially in relation to the infrastructure. Only " capacitation", "Accommodation" and "Personal protective

equipment" showed considerable differences, with the first reported by more managers than volunteers and the last not indicated by any of the managers. The offer of certificates was the main trade-off reported by both the PAs managers and the volunteers.

DISCUSSION

Was identified significant differences between the perceptions of managers and volunteers regarding the objectives of VW in PAs, and "Assistance with visitation" and "Support for PA management" were identified as the main objectives. Both volunteers and managers indicated that the most frequently performed activities were those related to "Environmental education/environmental interaction and interpretation" and "Support for visitation" and that the main form of support and trade-off for VW was the offering of certificates, but there was divergence regarding the provision of capacitation, with managers indicating that they occurred more frequently.

Corroborating the findings of Silveira-Junior et al. (2019), which were based on the call notices of the PAs and the official documents of state volunteer programs, was found that *Parques Nacionais* (in the category of *proteção integral*) were the PAs with the highest demand for VW in Brazil.

Four additional factors justify the increased demand for volunteers at parks: two are related to visitation, one is related to budget cuts and one to the increase in the number of PAs. First, tourism is one of the main objectives of Parques Nacionais (BRASIL 2000; GOMES et al. 2021) and has been encouraged since the creation of Yellowstone, the first national park (DUDLEY; STOLTON, 2010). The second factor is related to the increasing visitation of protected areas worldwide, especially parks (RYAN; KAPLAN; GRESE, 2001; SAVAN et al., 2003; BRUYERE; RAPPE, 2007; MEASHAM; BARNETT, 2008). In Brazil, the increase in visitation to in federal PAs quadrupled over 12 years, from 2,902,010 million visitors in 2006 to 12,389,393 million in 2018. Among the ten PAs that contributed most to this increase, the top five are *Parques Nacionais* (MMA 2020). It should be noted that all four of these contributing factors are related to one of the objectives of neoliberal conservation, which is to create new demands and goods (DUFFY, 2015; VASAN, 2018). To this end, PAs are created in natural areas that conserve great scenic beauty motivated by the ecotourism market, or, when such attractive areas already exist, they are transformed into products to be consumed, thereby encouraging their visitation (SEGI, 2014; HOLMES; CAVANAGH, 2016).

The third factor concerns cuts in budgets for environmental management, specifically those for PAs in Brazil. In 2010, the environmental management budget was approximately US$ 6.309,000,000.00 and in 2019, it decreased to US$ 30,92,793,912.80 (BRASIL, 2020). As parks require more resources (MUANIS et al., 2009), budget cuts make it impossible to perform certain activities due to labor shortage, thus requiring more volunteers (SILVEIRA-JUNIOR et al., 2019). The last factor is related to the increase in the number of PAs; among these, parks comprised the *Proteção Integral* category with the greatest growth in Brazil, since 130 PAs were created between 2009 and 2019 alone, and these new ones comprise 27.37% of all existing parks in the country (MMA 2020).

There is an understanding that together, these four factors influence the increased demand for volunteers, especially in public use activities. As our results demonstrate, activities related to "Environmental education and interpretation" and "Support for visitation" present the greatest demand. For managers, the first type of activities is the most important, and for volunteers, it is the second most important.

The second most frequently performed type of activities among PA volunteers, "Environmental education and interpretation", is an important strategy for the conservation objectives of PAs that receive visitors. This strategy improves visitors' knowledge and understanding of the value of PAs, which justifies their existence; increases the public's satisfaction with the visit; minimizes or prevents the impact of visitors on the area; and favors the support and participation of the community living around the PA (SUREDA et al., 2010). We did not aim to evaluate the quality of the environmental education conducted in PAs, which could have been done through indicators (ZORRILLA-PUJANA; ROSSI 2016) if it had been our objective. However, was asked whether the volunteers had been trained to perform activities that require preparation, such as "environmental education and interpretation", or for the other activities they performed. Bonneau et al. (2009) noted that the training of volunteers with the Texas Master Naturalist program increased the participants' knowledge about ecology and wildlife management and their motivation to volunteer. The results of the presented study showed that less than half of the volunteers reported having participated in capacitation courses, which, to

our understanding, puts at risk the results of the volunteer-based activities, especially those related to environmental education and interpretation and misses an opportunity to sensitize visitors to conservation. In addition to threatening the results of volunteer-based activities, the lack of capacitation threatens the VW itself because people who have volunteered in the past name a lack training or capacity building as a factor that discourages them from volunteering again, according to Liarakou *et al.* (2011).

The results showed that there are two main objectives of volunteer activity: "Assistance with visitation" and "Support for PA management". This result differs from that indicated by the call notices and state programs for volunteers in Brazil, as verified by Silveira-Junior *et al.* (2019), who indicated that the main demand is to obtain human resources to work in PAs. Our results reinforce the need for capacitation courses to ensure that PA visitation is an enriching experience, because both objectives require specific knowledge (SUREDA et al., 2010). Human resources is one of the aspects considered by RAPPAM in the evaluation of the PAs effectiveness, which has revealed the current situation of Brazilian conservation management. As an example, an evaluation carried out in the Brazilian Amazon in 2015 showed that the local PAs only achieved average values of 55% in terms of human resources (WWF, 2017), while in the state of São Paulo, in 2004, the PAs reached values lower than 20% at the same level aspect (WWF-BRASIL; FUNDAÇÃO FLORESTAL, 2004).

Another factor that still needs to be considered is the fact that the PAs that composed this study are part of a select group that have infrastructure for activities for public use, as there are PAs that are "paper parks", created by the government, but not they do not have human and financial resources, nor basic infrastructure (PIERACCINI et al., 2017).

The present study found that among the nine main objectives, "Obtaining human resources" was the fifth most frequently reported by both managers and volunteers. Although these stakeholders did not assume that the main objective was to obtain human resources, the performance of volunteers in various activities reflects the demand for human resources among Brazilian PAs. As a comparison, each employee of the ICMBio, the Brazilian body responsible for federal Conservations Units, is responsible for 70,000 hectares (0,7 km²) of PA, while in countries that serve as references for *in situ* conservation, such as South Africa, the United States and Argentina, the proportion does not exceed 2,500 hectares per employee (MEDEIROS *et al.*, 2011).

Providing "Practical experience" was the fourth most frequently noted objective. This result is closely linked to another finding of this study, which is that the majority of volunteer students or people were educated in areas directly linked to nature conservation. The same result was found in Silveira-Junior *et al.* (2019), who analyzed notices and programs that revealed that the ideal volunteer profile is a student, preferably from an environmental area of study. This connection raises two questions: are more students and graduates linked to nature conservation areas due to the demands of PAs, which seek volunteers with high levels of academic knowledge about conservation? Or are students/graduates linked to nature conservation areas driven to volunteer in PAs in a search for practical experience related to their academic background? It cannot answered these questions with certainty; however, the results suggest that the answer to both questions is yes, as there may be an exchange between the two parties - the volunteers and the PAs. While volunteers receive practical experience in environmental conservation that they lacked in school and improve their education, the PAs receive volunteer workers to support the PA management in various activities, especially those related to public use. As described in Notice 01/2016 on the objectives of the volunteer program of the PA "*Área de Relevante Interesse Ecológico* Mata de Santa Genova", the volunteer program is fundamental for the implementation of several programs fixed in the management plan, that may add labor to the unit's team.

Volunteers can also enrich their resumes because they are awarded a certificate of participation, a benefit that was identified in this study as the most common type of trade-off and support for VW among the six listed. However, if the participation of volunteers is based only on the principles of neoliberalism, the tendency to volunteer to improve one's own skills and be more competitive in the labor market will prevail (DEAN, 2014). On the other hand, if VW is also based on altruistic principles and aims to benefit the community, it can believe that volunteers will collaborate to support the management of PAs. In this sense, work in PAs is similar to Voluntary Tourism, which is configured as a sustainable tourism alternative, in which tourists voluntarily participate in social projects seeking to contribute to local communities, scientific research or ecosystems (WEAVER 2015; BÁRCIA; DANTAS 2017).

However, even if there is some exchange of benefits, VW in PAs serves a palliative purpose, filling in the gaps that the neoliberal economy has created in conservation by encouraging increased visitation of legally protected tourist destinations (SEGI, 2014; HOLMES; CAVANAGH, 2016) that the state is responsible for managing but cannot afford to because it chose to reduce budgets (DEAN, 2015).

This study did not evaluate the quality of VW in PAs. However, there is a belief that if the activities are carried out without proper capacitaion, there is a possibility that the both sides will be frustrated with the results: neoliberal conservation will not support the management of PAs, even with the commitment of time and resources, and volunteers will not obtain practical knowledge of conservation. It is convinced that even if there is sufficient training for volunteers to perform the activities planned by PA managers, they will never replace the work of experienced and trained staff and experts. Volunteers are important and can contribute to conservation, but must do so in a scenario in which PAs have sufficient financial resources for their management activities and adequate staff to support the extent of their area and meet the objectives of their management category.

CONCLUSIONS

In conclusion, it is important to recall the question that guided this study: What is the role of VW in PAs? From our case study, it can point out that in a scenario in which a PA has sufficient human and financial resources, VW can contribute to the objectives of the PA by providing support for management in public use activities, especially by supporting visitation and environmental education and interpretation activities. Thus, the VW in PAs would be working as voluntary tourism, favoring the conservation of ecosystems and its volunteers, who would take advantage of the structures to acquire knowledge and leisure. However, in the current scenario, in which the effects of neoliberal conservation are evident, VW serves a palliative measure to reduce the impacts of the dismantling of environmental policy that has affected Brazil and many other countries of the global south that have PAs and are adopting the illusory ideals of neoliberal conservation.

It also reveals another important role of VW in PA that deserves further study. It consists of providing practical experience to university students in fields of study directly related to conservation, a service usually provided through internships. In this sense, studies that investigate the factors that motivate students to carry out VW in PAs and choose certain areas to the detriment of others also open to this work would be important. In this way, the participation of other research centers in this investigation and of the PAs that receive volunteers would be essential, which would also considerably increase the sampling.

Another emerging question that deserves attention in future studies is: how is volunteering developing with the advent of concessions for public use in PA? What is the world stage? In Brazil, a country where the privatization process is being carried out at an accelerated pace, such as the VW, is it being carried out in PAs in which public use has been granted for exploitation by the private sector?

ACKNOWLEDGMENTS

Authors would like to thank the Associate Editor and the anonymous reviewers for their comments, to the *Instituto Chico Mendes de Conservação da Biodiversidade* for the license (nº 70404-1) granted to carry out this research, to the managers of the Protected Areas, and to the volunteers for having dedicated time of their lives to nature conservation and for participating in this research.

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AUTHORS' CONTRIBUTION

Wanderley Jorge da Silveira Junior conceptualized and investigated the project, did the data curation, performed the methodology, administrated the project and wrote the text – reviewed & edited. Lucas Dezidério Santana performed the data curation, conceptualized and investigated the project. Cléber Rodrigo de Souza supervised and investigated the project and did the normal analysis. Renata Vichi Yaguinuma chased the resources and investigated the project. Carolina Ribeiro Gomes administrated and visualized the project. Marco Aurélio Leite Fontes validated and supervised the project.