

Assessing contributions of volunteer tourism to ecosystem research and conservation in southern Africa



Kim G. Roques^{a,*}, Susan K. Jacobson^b, Robert A. McCleery^b

^aAll Out Africa Foundation, Roki Centre, Main Road, Ezulwini, PO Box 153, Lobamba, Swaziland

^bDepartment of Wildlife Ecology and Conservation, University of Florida, PO Box 110430, Gainesville, FL 32611, USA

1. Introduction

Determining if ecotourism can make a meaningful contribution to the conservation of ecosystems in a world of population expansion and biodiversity degradation is of pressing concern. Recreational use is a valuable service provided by ecosystems. Natural systems can provide spiritual, health, social and cultural benefits, and payment for these services can deliver large economic benefits. Ecotourism may be a livelihood alternative for communities that choose conservation of ecosystems over and above other more extractive land-uses (Honey, 1999; Stronza, 2007), but the extent to which ecotourism can deliver conservation benefits deserves further investigation (Cousins et al., 2009). Empirical case studies evaluating the conservation benefits from ecotourism programs are limited and a framework for such is needed.

One form of ecotourism that has shown rapid growth over the past two decades is volunteer tourism (Elliott, 2008), where travelers participate in voluntary work as an element of their experience (Wearing, 2001). Volunteer tourism has been positioned under the banners of 'alternative tourism' (e.g. Ellis, 2003), 'ecotourism' (Gray and Campbell, 2007), 'new tourism' (Poon, 1993), 'niche tourism' (Novelli, 2005), 'voluntourism' (Elliott, 2008) and 'moral tourism' or 'goodwill tourism' (Butcher, 2003). It is a form of tourism where participants seek a responsible, interactive experience that contributes direct financial, labour and intellectual resources to specific projects (McGehee, 2014) and allows for cultural exchange and transformative learning for the volunteers (Wearing et al., 2017). In 2008 an estimated 1.6 million people participated in volunteer tourism projects spending up to £1.3 bn per year (Tourism Research and Marketing, 2008). Since 2008 volunteer tourism has continued to grow at a rapid pace and is now widespread across the globe (Wearing et al., 2017). Volunteer tourism has been lauded as a great opportunity for meeting conservation and development needs (Brown, 2005; Keese, 2011; Ong et al., 2014). It has been promoted as contributing to an ethic of global citizenship where altruism and community are considered central to the experience (Wearing, 2001; Brown and Morrison, 2003). Alternatively, it has been criticized for having negative impacts on communities (Guttentag, 2009) and encouraging a false sense of self-satisfaction

among travelers (Caton and Santos, 2009; Cousins et al., 2009). Furthermore, some consider volunteer tourism a form of economic neo-liberalism and commodification of voluntary service (Lyons et al., 2012; Sin et al., 2015). However, volunteer tourism has only recently been rigorously assessed and there are few empirical evaluations of its positive and negative impacts (Wearing et al., 2017).

Research suggests that volunteer tourists who choose to participate in conservation projects may be personally motivated to help the environment or to develop their skills, knowledge and experience (Tomazos and Cooper, 2012). Many may choose projects because of their fondness for certain types of animals (Lorimer, 2010), or because of the location of the project (Grimm and Needham, 2011). Some studies suggest that conservation volunteer tourism can provide long term funding for conservation (Brightsmith et al., 2008; Brondo, 2015) whereas others argue that it is the unsustainable commodification of nature and that volunteer tourism organizations are overly profit driven (Smith and Font, 2014). Empirical assessments of the extent to which volunteer tourism has delivered conservation and scientific benefits are sorely needed not only to answer the question of how much conservation benefit it has, but also to recommend best practices for its future development. A framework for such would allow for useful comparison of the impacts of these programs and could guide the design of project activities.

Given the importance of ecosystems and the increasing demand for their services, investments in better understanding and conserving them are lacking (Waldron et al., 2013; Bennett et al., 2015). Furthermore, the skills and financial resources for ecosystem research and conservation tend to cluster in certain regions and are inadequate in others (Bonine et al., 2003; Waldron et al., 2013). Ironically these under-resourced regions are often where there is greatest imminent threat to biodiversity and socio-economic wellbeing (Bonine et al., 2003) and therefore greatest need for scientific research and conservation endeavor to curb threats that would diminish ecosystem services. In locations where traditional funding sources for research and conservation (such as government and international non-governmental funding) are lacking, alternative solutions are needed to support these activities. Swaziland and Mozambique are two such countries (CEPF, 2010). This study examines whether volunteer tourism can be a solution for meeting ecosystem research and conservation needs in countries like these. If so under what conditions? What scientific

* Corresponding author.

E-mail address: kim@alloutafrica.org (K.G. Roques).

and conservation outputs can be expected? At the same time, what recreational, educational and cultural opportunities attract and satisfy volunteer tourists? Elucidating answers to these questions is the purpose of this paper and will enable evaluation of whether volunteer tourism could be a win–win situation for both conservation and volunteers.

The socio-economic and environmental needs in southern Africa are vast given a burgeoning population, huge income disparity and pervasive disease prevalence (e.g. HIV AIDS, tuberculosis, malaria) (Leibbrandt et al., 2009; Sawers and Stillwaggon, 2010) in an area with high global biodiversity importance (Brooks et al., 2006) and high risk of climate change (Ringler et al., 2010). In addition to these challenges, southern Africa has many opportunities. It is a particularly attractive tourism destination (Keese, 2011), combining an impressive array of natural and cultural attractions with well-established infrastructure for tourism. In association with these attractions and needs, volunteer tourism has become a particularly popular activity in southern Africa (Stoddart and Rogerson, 2004; Alexander, 2012; Phelan, 2015; Van Tonder et al., 2017). South Africa has consistently been in the top ten most visited countries worldwide for volunteer tourists (Keese, 2011). We seek to evaluate the extent to which volunteer tourism can be a useful approach to meet the need for ecological research and conservation in southern African ecosystems, and if so under what conditions and how it can be better applied. We provide a case study to analyze demographic profiles of volunteer tourists visiting southern Africa and identify what motivates their participation and satisfaction. As ecosystem services provide opportunities for volunteer participation, we examined the specific project outputs and impacts that foster biodiversity conservation and contribute to capacity-building and socio-economic wellbeing.

2. Case study sites

2.1. Volunteer tourism at All Out Africa

We present results from case studies of a southern African volunteer tourism organization called All Out Africa. All Out Africa has been operating since January 2004 and was founded in Swaziland

but currently has established operations with permanent staff and premises in Swaziland, South Africa, Mozambique and Botswana. All Out Africa is a social-enterprise which includes both a business entity and a non-profit entity. The business focuses on marketing and providing responsible tourism experiences, the non-profit organization focuses on implementing social development and conservation projects. The social projects are largely education orientated and the conservation projects largely research orientated. The business started as a volunteer tourism business but has diversified and now receives customers on a range of responsible tourism experiences from volunteer projects to educational tours. The non-profit receives funding from various international and local donors including the business. The business employs 35 full-time staff and the non-profit employs 5 full-time staff.

Our case study has two elements: first, an analysis of the volunteer tourist demographics, motivations and satisfaction across the program. This is important since it adds to the body of knowledge of how to develop a viable volunteer tourism program and sheds light on some of the ecosystem services derived by these tourists. The second element of our case study is a comparison of the volunteer effort and conservation outputs from two ecosystem research and conservation projects run by All Out Africa: a marine conservation project in Mozambique and a savannah conservation project in Swaziland. This is important for understanding the scientific and conservation benefits provided by these volunteer projects of relevance for maintaining ecosystem services.

2.2. Swaziland savannah conservation site

The savannah conservation project site (Fig. 1) comprises approximately 3700 km² in the north eastern region of Swaziland, southern Africa (31°50"E, 26°10"S – 31°57"E, 26°23"S). The topography is undulating ranging from 50 to 300 m above sea level. The geology includes basalt lowlands with dolerite intrusions and rhyolite hills. Rain falls predominantly during the summer months (October–April) and averages between 550 and 725 mm annually (Matondo et al., 2005). The project site is a conservation area and includes three reserves that are managed separately but cooperate through a partnership called the Lubombo Conservancy: Mbuluzi Game Reserve (a private protected area owned and man-

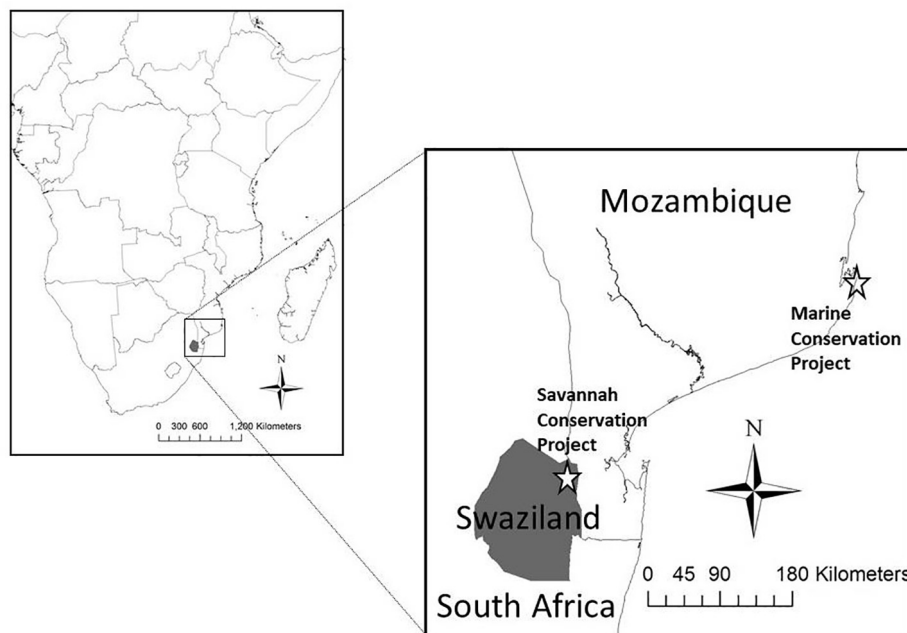


Fig. 1. Site map showing location of All Out Africa's Savannah Conservation Project in Swaziland and Marine Conservation Project in Mozambique.

aged by 30 shareholders); Mlawula Nature Reserve (a national protected area owned and managed by the parastatal Swaziland National Trust Commission); and Hlane Royal National Park (a national protected area owned by His Majesty King Mswati III and managed through royal decree by the private trust The Big Game Parks of Swaziland). These areas have experienced isolation and surrounding land-use change (Roques et al., 2001; Bailey et al., 2016) with associated threats to the maintenance of ecosystem services and conservation of biodiversity. These threats include habitat transformation, poaching, keystone species removal, alien species invasion and pollution, among others. Surrounding land-use includes intensive irrigated sugar cane agriculture, extensive rangeland cattle farming and communal subsistence farming with a mix of dryland cropping and pastoralism. The savannah conservation project has been a volunteer site run by All Out Africa since 2004 and since then it has had an ecologist (MSc graduated) and an assistant employed full-time based on-site conducting ecosystem monitoring and research. Since 2004 All Out Africa has been collaborating with the University of Swaziland, Mbuluzi Game Reserve, the Swaziland National Trust Commission and the Big Game Parks of Swaziland in order to conduct and share the outputs of the ecosystem monitoring and research. Since 2011 the University of Florida and University of Swaziland has been collaborating on this project to assist in the planning and implementation of ecosystem monitoring and research. In 2013 a permanent research centre was established for the project in Mbuluzi Game Reserve.

2.3. Mozambique marine conservation site

The marine conservation project site (Fig. 1) is based at Praia d Tofo (Tofo beach) (35°32'E, 23°51'S) a small seaside resort village in the Inhambane region of Mozambique about 400 km northeast of the capital, Maputo. The project site includes the in-shore zone and intertidal zone ranging approximately 10 km north and south of Tofo and extending to 1 km from shore. The sea depth in the project site ranges from zero to 30 m below sea level and the substrate is predominantly sandy with occasional coral reefs on rocky outcrops. The ocean-use is a mixture of scuba diving and snorkeling tourism, subsistence fishing and sport fishing. Human population growth and economic development in the region have accelerated rapidly since the end of the Mozambique civil war in 1992 which has resulted in increased threat to the maintenance of marine ecosystem services and biodiversity. These threats include overfishing, poaching, pollution and coral bleaching among others. Although not yet protected, the area has been proposed as a marine protected area (Haskell et al., 2014). Surrounding land-use includes subsistence farming with a mix of extensive relict coconut palm plantations, small scale dryland cropping and limited pastoralism. The marine conservation project has been a volunteer site run by All Out Africa since 2007 and since then it has had a marine biologist (MSc graduated) and an assistant employed full-time based on-site conducting ecosystem monitoring and research. Since 2007 All Out Africa has been collaborating with the Tofo based dive centres (in particular Tofo Scuba and Peri-peri Divers) and the Marine Megafauna Foundation (during 2007–2013) and has been an active member of the Mozambique Associação Tartarugas Marinhas (Association for the Conservation of Marine Turtles) to conduct and share the outputs of the ecosystem monitoring and research. Since 2017 the Louisiana State University has been collaborating on this project to assist in the planning and implementation of ecosystem monitoring and research.

2.4. Critical needs at case study sites

Key needs for addressing ecosystem threats at the case study sites include: (1) research and planning to identify mechanisms

and design suitable action plans to mitigate threats, and (2) education and awareness interventions to develop necessary skills and motivations for action. In both regions, there are significant human capacity and resource shortages in research, planning, education and awareness.

2.5. Volunteer project goals

Both projects have the dual goals of conducting ecological field research and monitoring for the conservation of biodiversity and ecosystem function and providing educational learning experiences to develop skills and conservation ethics. Both projects have field research centres which host short-term field-based volunteers and students and long-term researchers. Both are run by All Out Africa and have the necessary field equipment, infrastructure, facilities, transportation and budget to enable the successful collection of field data.

3. Methods

3.1. Data collection

We used the booking records of All Out Africa from 2009–2016 to compile data on the age, sex, type of project, and source country of volunteers. This included records for 2085 volunteers. We collected data on the satisfaction of volunteers from departure surveys received by All Out Africa from 2012 to 2016 that included completed surveys from 304 volunteers. We collected data on trip selection basis and motivation from an arrival survey questionnaire carried out by All Out Africa during 2016 that resulted in completed surveys from 61 volunteers. Volunteers were asked about their motivation to participate using a 5-point (–2 to 2), Likert-type scale (“strongly disagree”, “disagree”, “neutral”, “agree” or “strongly agree”). Averages were derived from summed scores for all respondents for each question. We collected data on the number of volunteer days spent on the Savannah Conservation project and Marine Conservation project from the booking records of All Out Africa from 2009 to 2016 which included a total of 15,154 volunteer days. We recorded the research and conservation outputs (e.g. number of peer reviewed publications) produced from the Swaziland savannah and Mozambique marine conservation projects respectively based on project records maintained by All Out Africa. These included 51 project outputs in 7 categories of conservation activity, based on the evaluation framework of Kapos et al. (2008). We used an 8 element framework adapted from GCSV (2007) to provide guidelines for successful volunteer tourism programs to help sustain ecosystems.

4. Results

4.1. Demographic background of volunteer tourists

Of the 2085 volunteer tourists that joined All Out Africa during 2009–2016, 77% were female and 43% were aged 20–22 years (Fig. 2). The gender discrepancy for volunteer tourists was greatest for 20–22 year olds (82% female) but decreased slightly (71%) for the oldest and youngest age brackets (<19 years and >46 years).

Of the 2085 volunteer tourists in the southern Africa program, 63% were from Europe, 21% from North America and 14% were from Australia (Table 1).

Of the 2085 volunteer tourists that joined All Out Africa the greatest proportion participated for 3–4 weeks (Fig. 3) followed by 2 weeks or less, then progressively fewer joined for periods of longer than 4 weeks.

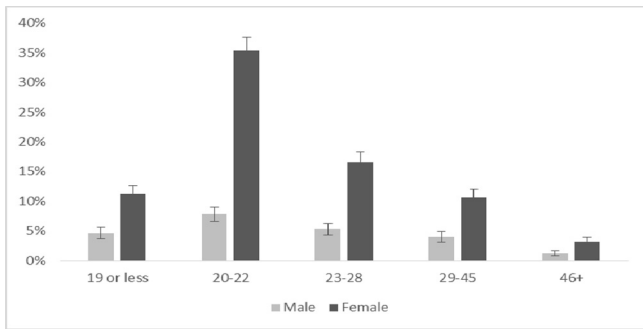


Fig. 2. Proportion of volunteers that participated according to age category (years) and gender.

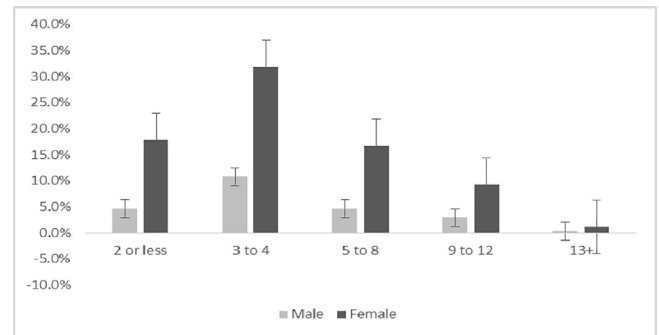


Fig. 3. Proportion of volunteers that participated according to duration of experience (number of weeks) separated by gender.

Forty-two percent of volunteer tourists chose to do projects focused on conservation, 57% focused on social benefits and 1% did both. The discrepancy between male and female participation was greatest in Child Care and Teaching projects (Table 2), which involved feeding and early developmental education at informal pre-schools. The discrepancy was lowest in building projects, which included building simple structures such as classrooms, kitchens, toilets and simple homes (Table 2). Child Care and Teaching was the most popular project, particularly for females. Marine Conservation was the most popular project among males.

For the sample of 61 volunteer tourists surveyed during 2016, 89% chose the trip based on the experience, 62% chose the trip based on the destination and 15% chose the trip based on a referral. The strongest motivation for the sample volunteers to participate was “gaining experience” then “enjoying new places and cultures” followed by “gaining new skills and knowledge,” and “helping people on a worthwhile project” (motivation scores Table 3). “Furthering my career” was the lowest reported motivation for participating.

For the sample of 304 volunteer tourists, 97% of respondents answered “agree” or “strongly agree” to the statement: “I would recommend the experience to friends”. There was some variation by destination with 98% of Swaziland volunteers and 78% of

Table 3

Volunteer motivations for participating in 2016.

Motivation	Positive response	SD	Motivation score
(a) Gaining new skills and knowledge	98%	0.035	98
(b) Developing my personal capacity outside of my comfort zone	90%	0.075	86
(c) Helping people on a worthwhile project	88%	0.079	88
(d) Helping the environment on a worthwhile project	74%	0.110	65
(e) Meeting people and making new friends	74%	0.110	72
(f) Enjoying new places and cultures	97%	0.043	103
(g) Having fun	89%	0.079	88
(h) Gaining experience	98%	0.035	106
(i) Furthering my career	58%	0.124	50

Mozambique volunteers answering positively. Satisfaction levels differed among different elements of the volunteer experience. Satisfaction was lowest for pre-arrival and arrival elements of the experience but this did not seem to dampen overall satisfaction. There was no significant gender difference in satisfaction level (C hi-squared = 0.64, *p*-value = 0.42).

Table 1

Proportion of volunteers that participated according to source country and continent.

Country	Europe	North America	Australasia	Africa	South America
UK	25%				
USA		16%			
Australia			13%		
Germany	11%				
Netherlands	9%				
Canada		6%			
Switzerland	5%				
Sweden	4%				
Norway	2%				
Other	6%		2%	1%	1%
Total	63%	21%	15%	1%	1%

Table 2

Proportion of volunteers that participated in different projects, by gender averaged across years.

Project	Female	SD	Male	SD
Child Care and/or Teaching	38%	0.021	7.9%	0.012
Marine Conservation	16%	0.016	8.2%	0.012
Savannah Conservation	16%	0.016	3.5%	0.007
Building	2.1%	0.006	2.0%	0.006
Sports	2.2%	0.006	1.2%	0.005
Entrepreneurship	2.3%	0.006	0.4%	0.003
Medical	0.5%	0.003	0.2%	0.002

4.2. Case study comparison of two conservation projects

All Out Africa volunteers contributed 15,154 volunteer days on ecosystem research and conservation projects during 2009–2016. Fifty-six percent were spent on the Mozambique marine conservation project and 44% were spent on the Swaziland savannah conservation project.

We modified the framework developed by the Cambridge Conservation Forum (Kapos et al., 2008) to list the outputs of these two volunteer tourism conservation projects (Table 4). See <http://www.cambridgeconservationforum.org.uk/initiative/harmonising-measures-conservation-success> to access the detailed framework.

5. Discussion

Volunteer tourists seek a responsible, interactive experience that contributes direct financial, labour and intellectual resources to specific projects (McGehee, 2014) and provides the participant with cultural exchange and transformative learning (Wearing et al., 2017). The extent to which volunteer tourism represents an opportunity for meeting conservation and development needs to sustain ecosystem services depends on the participants themselves, but to a larger extent on how the projects are designed and managed. The case studies provided here help us to gain an understanding of the participants of such programs, assess conservation outputs and suggest a framework for the future design and management of such programs. A better understanding of volunteer tourism programs can lead to improved experiences for participants and more positive impacts on the maintenance of ecosystem services that both attract volunteers and benefit from their actions.

5.1. Understanding volunteer tourists

All Out Africa hosted over 2085 volunteer tourists during this study. The predominance of participants from European and North American countries reflects a pattern similar to regular tourist visitation to southern Africa (UNWTO, 2016). A number of factors are likely to drive this, including the appeal of the destination and activities available and the ease of travel as well as the financial capability to travel abroad and participate. Our finding that 62% of volunteers chose their trip based on the destination, suggests that the recreational and aesthetic services provided by African ecosystems can help attract and expand these types of tourism programs. Southern Africa is a popular destination for volunteer tourism, however, if one considers the total international arrivals worldwide, two interesting points emerge: first Africa accounts for a mere 5% (UNWTO, 2016) of international arrivals; and second, the number of international arrivals worldwide is growing rapidly (UNWTO, 2016). This suggests that there is the potential for southern Africa to capture a larger proportion of a growing number of international arrivals which also represents a significant opportunity to expand volunteer tourism opportunities.

The predominance of female participants is a trend widely observed in educational travel experiences but has yet to be adequately explained (Salisbury et al., 2010). In this study 77% of the 2085 participants were female. Even for building and sports projects where the discrepancy was lowest, males were still outnumbered by females. Since there are equal opportunities for males and females to join such programs this discrepancy indicates preference of choice. One possible explanation is that females are more inclined to travel abroad for non-work related activities (Collins and Tisdell, 2002). Another possible explanation is that there may be a greater tendency for females to join organized volunteer tourism programs whereas males may be more inclined to travel independently and arrange their own activities either for reasons

of safety or preference. It is possible that the trend is a result of both of these explanations combined. This may inform marketing messages and the targeting of prospective participants by volunteer tourism programs and may inform the design of volunteer project activities. On the other hand, it may highlight an opportunity to encourage more male participation and thereby boost overall numbers.

The most prevalent age group of participants on this program is the 20- to 22-year old undergraduate aged participant. This is consistent with other studies of volunteer tourism in the region (Alexander, 2012; Van Tonder et al., 2017). This age group is well aligned with goals of education and awareness for creating a conservation ethic through such projects, however since they may be less experienced than older participants one may expect reduced project outputs per unit effort (Jacobson et al., 2012). These results leave one questioning why there are not more participants in the over 46 year old age group on such programs? Whether this is a result of preference or marketing targeted at younger prospects remains to be tested.

While a high proportion of respondents from this study selected 'helping people' and 'helping the environment' as reasons for participating in the experience (88% and 74% respectively), 'gaining new skills and knowledge' and 'gaining experience' were selected by an even greater proportion of respondents (98%). This is consistent with other studies of similar-aged participants (Wearing and McGehee, 2013) but contrasts with the results of Jacobson et al. (2012) who found that for older volunteers (63% of who were aged 40–64 years) 'help the environment' was the strongest motivation for participating. However, consistent with the results of Jacobson et al. (2012) 'furthering my career' was the weakest motivation for participating. Motivations are bound to vary between people and programs, but understanding these is important in selecting suitable volunteers for a particular program (Coghlan and Fennell, 2009) and in providing volunteer tourists with a rewarding experience. It can also help optimize the use of volunteers to help conserve natural resources and ecosystem services (Carlton and Jacobson, 2012).

5.2. Benefits of volunteer tourism for ecosystem research and conservation

As a result of the goals and design of the savannah conservation project in Swaziland and the marine conservation project in Mozambique many of the conservation outputs from these projects fall under the categories of 'education and awareness' and 'research and planning'. These were priority needs identified during the design of these two projects and are therefore consistent with meeting local conservation needs. 'Improving livelihoods' and 'capacity building' were other categories where important outputs were achieved for the benefit of conservation. While there were some significant outputs achieved under the categories of 'policy and legislation', 'managing sites' and 'managing species', these were fewer for this particular case study. Nevertheless, some important outputs were still achieved under these categories. For example, the consultancy services for planning and securing \$6 million of donor financing for Strengthening the National Protected Area System of Swaziland which will likely have a significant impact on future conservation activities across this small nation. While it may be argued that this particular output was not a direct result of volunteer tourism activities, it was staff of All Out Africa (who are employed through volunteer tourism) that provided the technical assistance that resulted in the output.

Whether or not volunteer tourism programs can deliver useful research outputs has been debated (Ellis, 2003; Cousins et al., 2009). Peer-reviewed publications require rigorous data collection, analysis and documentation of the results. As such, they are a fairly

Table 4

Outputs and impacts of the volunteer tourists at the Mozambique marine conservation project and Swaziland savannah conservation project (adapted from Kapos et al., 2008).

Conservation impact category	Mozambique project outputs	Swaziland project outputs
<p>1. Managing species Actions directly involving species themselves.</p>	4 years of turtle anti-poaching patrols	1 year of marabou stork (<i>Leptoptilos crumenifer</i>) chick supplementary feeding 1 year of white backed vulture (<i>Gyps africanus</i>) supplementary feeding 2 years of alien invasive plant species removal
<p>2. Managing sites Actions directly manipulating or managing a particular site</p>	6 years of occasional beach rubbish removal on Tofo beach	5 years of incidental anti-poaching observation and informing for Mbuluzi north
<p>3. Improving livelihoods Actions to improve the well-being of people having impacts on the species/habitats of conservation interest.</p>	2 permanent and 2 temporary conservation project jobs created on-site 11 classrooms and 2 toilet buildings built at 7 schools Revenue and jobs for organizational management, administration and support Revenue and jobs for accommodation, food and transport provision Revenue and jobs for scuba diving and boat launch activities Revenue and indirect jobs from volunteer secondary expenditure	2 permanent and 2 temporary conservation project jobs created on-site Revenue and jobs for organizational management, administration and support Revenue and jobs for accommodation, food and transport provision Revenue for conservation area rent and access Revenue and indirect jobs from volunteer secondary expenditure
<p>4. Policy and legislation Actions to establish frameworks within the processes of government, civil society or the private sector that make conservation goals official or facilitate their accomplishment.</p>	Data and advisory input for development of the Mozambique turtle conservation management policy Data and recommendations for development of the Mozambique whale shark tourism code of conduct	Consultancy services for planning and securing donor financing for a \$6 million national protected area strengthening and expansion program Participation in development of the Lubombo conservancy non-government organization Consultancy services for planning and securing donor financing for Swaziland's portion of a Critical Ecosystem Partnership Fund hotspot conservation program
<p>5. Education and awareness Actions directed at improving understanding and influencing behavior among people not necessarily directly involved in conservation action.</p>	475 international volunteer tourists trained in scuba diving and marine ecology 200 local residents trained in marine wildlife and ecology 600 local school children trained in marine wildlife 24 beach cleanup campaigns and recycling awareness events 2 popular magazine articles on marine conservation 7368 people aware of marine conservation through social media, blogs, videos and newsletters	386 international volunteer tourists trained in savannah ecology and field research 40 local residents trained in savannah wildlife and ecology 100 local school children trained in savannah wildlife 3 popular magazine articles on savannah conservation 7368 people aware of savannah conservation through social media, blogs, videos and newsletters
<p>6. Capacity building Actions to enhance specific skills among those directly involved in conservation, includes both building individual skills and improving the many components of organizational capacity.</p>	11 staff trained in ecological field research techniques and marine ecology 11 staff trained in project management and administration 8 presentations at national or international conferences based on volunteer data 2 swim instructors trained to coach kids to swim	11 staff trained in ecological field research techniques and savannah ecology 16 local university students trained in savannah ecology and field research 11 staff trained in project management and administration 16 presentations at national or international conferences based on volunteer data Free occasional ecological advisory services for conservation management
<p>7. Research and planning Actions aimed at improving the information base on which conservation decisions are made.</p>	8 peer reviewed scientific publications based on volunteer collected field data 9 years of whale shark (<i>Rhincodon typus</i>) population monitoring data 9 years of monitoring data for 60 selected species of coral reef fish 8 years of humpback whale (<i>Megaptera novaeangliae</i>) monitoring data 6 years of loggerhead turtle (<i>Caretta caretta</i>) and leatherback turtle (<i>Dermochelys coriacea</i>) nest and mortality monitoring data 9 years of incidental records of manta rays (<i>Mobulid birostris</i> , <i>Mobulid alfredi</i>) various threatened shark and ray species	44 peer reviewed scientific publications based on volunteer collected field data 11 years of breeding success monitoring data for marabou storks (<i>Leptoptilos crumenifer</i>) and white backed vultures (<i>Gyps africanus</i>) 2 years of spotted hyena (<i>Crocuta crocuta</i>) population and home range monitoring data 2 years of leopard tortoise (<i>Stigmochelys pardalis</i>) spatial ecology data 5 years of systematic savannah ecosystem monitoring data including small mammals, predators, ungulates, birds and vegetation

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Table 4 (continued)

Conservation impact category	Mozambique project outputs	Swaziland project outputs
	6 years of inshore bottle nosed dolphin (<i>Tursiops aduncus</i>) monitoring data	
	6 years of leopard shark (<i>Triakis semifasciata</i>) and smalleye stingray (<i>Dasyatis microps</i>) monitoring data	
	1 year of phytoplankton, eDNA and harmful algal bloom monitoring data	

Table 5

Elements of a successful volunteer tourism program, adapted from GCSV (2007) for All Out Africa activities for ecosystem research and conservation projects.

1: Planning and organization

Identified the purpose of All Out Africa and defined mission and vision.
 Assessed local conservation needs in line with mission and identified projects likely to be met through a volunteer tourism program.
 Conducted market research to identify similar programs, gaps and likely demand from volunteer tourists considering both destination and activities.
 Defined project goals (impact) and unique selling points (appeal).
 Developed a business plan with projected participation, revenue and expenditure.
 Contacted parks and local conservation authorities to establish co-operation.
 Contacted universities and NGOs to establish collaboration.

2: Policies and procedures

Defined the role of volunteers.
 Developed project briefs including destination and project information with task descriptions.
 Developed a volunteer code of conduct as a performance contract.
 Conducted risk assessments and developed safety policies and emergency procedures.

3: Volunteer tourist recruitment

Developed likely volunteer profiles based on market research.
 Identified target markets and communication strategies.
 Developed website, social media platforms and print marketing materials.
 Identified and initiated online and print advertising campaigns.
 Identified and attended relevant travel fairs and other marketing events.
 Contacted relevant travel agents to form co-operative partnerships.
 Developed volunteer application form with personal particulars and project details.
 Developed procedures for booking with terms and conditions.

4: Screening, interviewing and placement

Reviewed applicants based on their application forms.
 Identified special needs.
 Assessed applicants in relation to timing, project tasks and relevant skills.
 Conducted background checks where necessary and interviews where possible.

5: Orientation and training

Met volunteers on arrival.
 Introduced volunteers to other participants and the local team.
 Presented the purpose of All Out Africa, the project and the role of the volunteers.
 Clarified program expectations of the volunteer and vice versa.
 Carried out safety briefing, destination information and cultural awareness training.
 Conducted destination tour to familiarize the volunteer with the location, people and socio-economic norms.
 Conducted project orientation to familiarize the volunteer with the project site and activities.
 Conducted task and equipment training to enable the volunteer to carry out project tasks.

6: Supervision, guidance and support

Developed sensitivity to address volunteer personalities and motivational ability.
 Allocated tasks according to the interests and capabilities of the volunteers.
 Supervised tasks and corrected, trained or encouraged as needed.
 Met daily with volunteers as a group and at least twice weekly as individuals to discuss emotional, social or cultural challenges and addressed as needed.
 Maintained a reasonable work-load of volunteer tasks.

7: Volunteer performance evaluation

Developed indicators of good performance.
 Assessed volunteer performance and acted accordingly to maintain sufficient performance.
 Non-executive collaborators conducted occasional performance assessments.

8: Retention and recognition

Identified and facilitated volunteers that may be interested in staying longer or returning.
 Identified key motivators for volunteer participation and adjusted marketing information accordingly.
 Identified tasks that were a good match between volunteer satisfaction and conservation output and adjusted project design accordingly.
 Developed social media networks to maintain communication with past volunteers and share project and organizational progress.
 Developed newsletters for circulation to past volunteers to update them on project progress.
 Maintained direct communication with past volunteers where possible.

9: Measuring volunteer program effectiveness

Identified quantifiable and qualitative project outputs and established a system for monitoring these.
 Developed departure questionnaires to measure volunteer satisfaction and established response mechanisms.
 Conducted regular staff and organizational meetings to evaluate progress and established response mechanisms.
 Conducted staff strengths training and team collaboration workshops.
 Conducted organizational vision and legacy workshops with staff to evaluate organizational success.

stringent measure of successful field research. Outputs from this case study include 8 peer reviewed publications from All Out Africa's marine conservation project in Mozambique and 44 from the savannah conservation project in Swaziland during 2009–2016. It is possible that the Swaziland project has more publications than the Mozambique project because of greater collaboration with academic institutions with the capacity and motivation to analyze data and publish manuscripts. While volunteer tourists were not directly responsible for writing the manuscripts they were directly involved in the data collection and in most cases, staff of All Out Africa were involved in the analysis and writing of the manuscripts usually led by collaborating university faculty members. Conservation outputs are more broadly categorized, and included collecting species and habitat monitoring data, removing litter, anti-poaching observation, advising management policy, developing local organizational capacity, fund-raising and more. These outputs indicate that volunteer tourism programs can contribute to delivering important research outputs where volunteers are suitably managed, projects are effectively designed and where there is collaboration with institutional partners.

These results also inform the debate regarding whether, and under what conditions volunteers, as citizen scientists, can be successfully applied for ecosystem research (Dickinson et al., 2012). Citizen science has received growing attention over the past decade both as a means of gathering field data and engaging the public in research and conservation (Crain et al., 2014) and this study indicates that it can result in successful research outputs. It further shows that this is possible in countries such as Swaziland and Mozambique, which are not traditional global tourism destinations, where there are relatively few scientists and where there are limited governmental and international non-governmental organization resources dedicated to ecosystem research and conservation. This suggests a potentially important role for volunteer tourism in supporting research and conservation and improving livelihoods in other similar under-resourced regions, such as many parts of Africa.

5.3. A framework for developing effective volunteer tourism operations

The success with which volunteer tourism can be applied to meet conservation and livelihood needs in other locations will depend on many elements including the attractiveness of the destination and project activities for volunteer tourists and marketing. With any business, customer satisfaction is essential for sustainability and the same is true for volunteer tourism. Understanding the motivations of participants is an important starting point but a number of other elements are important in ensuring satisfied volunteers. Volunteer satisfaction levels in this study were high and we propose guidelines in order to achieve this for other programs (Table 5). Based on recommendations for nine key elements for a successful volunteer program (GCSV, 2007), we recommend that any volunteer tourism initiative pay attention to each of these elements in order to be successful from the perspective of volunteer participants and to maximize benefits from sustaining ecosystem services.

6. Conclusion

Given the shortage of skills and financial resources for ecosystem research and conservation (Bonine et al., 2003; Waldron et al., 2013) and the pressing need in regions such as southern Africa for maintaining ecosystem services (Sawers and Stillwaggon, 2010; Brooks et al., 2006), and particularly in under-resourced locations such as Mozambique and Swaziland, this case study demonstrates that volunteer tourism may deliver important

ecosystem research and conservation benefits. This study also demonstrates that ecosystems deliver important services to volunteer tourists. As evident from this study, the design and implementation of such programs is a key determinant of their success both from the perspective of ecosystems and volunteers. More empirical evaluations are needed in order to assess the effectiveness of volunteer tourism at providing scientific, social and conservation benefits. We recommend that the framework we applied for evaluating the scientific and conservation impacts on ecosystems be adopted by other volunteer tourism programs to assess project outputs and impacts. Further investigation is warranted given the importance of ecosystems and their services for sustaining human well-being (Bennett et al., 2015) and the potential of such programs to deliver benefits in regions that need it most.

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