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Review Article

Effects of wildlife tourism on human-wildlife conflict: a bibliometric analysis and scientific review

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Abstract

In this research, we systematically reviewed the impacts of wildlife tourism on human-wildlife conflict. Our findings of the four thematic areas provided significant insights about the previous research. They indicated that "wildlife management" and "disturbance" are emerging fields of research in this domain, and more recently, themes emerged around "human-wildlife conflict," "climate change," and "ethnoprimatology." Our literature showed that most of the wildlife tourism conflict involved wildlife behavior change (22.72%), crop riding (15.90%), and livestock depredation (9.09%), and few attempts have been made to explore the effects of wildlife tourism on other aspects of conflict such as attacks on human and negative attitudes towards wildlife. We provided significant insights about key areas of interest in wildlife tourism research, and it is expected that human-wildlife conflict will play a key role in generating future research on wildlife ecotourism research, which is necessary for human-wildlife coexistence.

Keywords: Conservation, Ecotourism, Human-wildlife conflict, Protected areas, Wildlife tourism

Introduction

Wildlife tourism enables people to enjoy wildlife. Moreover, it provides economic benefits and supports the conservation of biodiversity (Barnes et al., 1992; Ballantyne et al., 2009; Mustika et al., 2013; Smith et al., 2021). The market for wildlife tourism has expanded considerably in many

countries (Okello & Yerian, 2009; Curtin & Kragh, 2014). Currently, reliable figures for the economic impact of this type of tourism are not available; however, it is certain that the industry engages many people and generates considerable revenue (Higginbottom & Scott, 2004). Additionally, wildlife tourism boosts the economy of less-developed rural communities as wildlife tourism attractions are often located in remote areas (Higginbottom & Scott, 2004). This also opens up opportunities for new types of employment. For instance, safaris are reported to be significantly more profitable than animal farming in some areas in sub-equatorial Africa; as a result, wildlife tourism has become the primary source of income for the local communities (Higginbottom & Scott, 2004).

The increased popularity of wildlife tourism stems from the demand for interaction with wildlife, particularly with charismatic species (Rodger et al., 2007; Semeniuk et al., 2010; Cong et al., 2014), which has given rise to several forms of wildlife tourism (Semeniuk et al., 2010). This upward trend calls for research into the impacts of tourism and strategies for sustainable management (Reynolds & Braithwaite, 2001). Expanding research and scientific knowledge about wildlife tourism can promote conservation, foster more effective education, and prevent potential negative impacts. Researchers have explored a variety of topics in wildlife tourism, including how wildlife is affected by tourism (e.g., Green and Higginbottom, 2000; Higginbottom et al., 2001; Meyer et al., 2020), application of geographic information systems (GIS) in wildlife tourism management (e.g., Magige et al., 2020; Asadi et al., 2022), wildlife-tourist behavior (e.g., Hughes et al., 2011; Packer et al., 2014; Ballantyne et al., 2018), and management of sites for wildlife tourism (e.g., Curtin, 2013; Newsome et al., 2019). Since the most attractive sites for wildlife tourists are often located in undisturbed habitats in developing countries, it is necessary to assess how wildlife tourism affects destinations before effective approaches to management can be formulated.

The persistence of wildlife in human-dominated landscapes represents a formidable conservation challenge as a result of real or perceived effects on humans and their livelihoods (Mohammadi et al., 2019; Mohammadi et al., 2021ab; Mohammadi et al., 2022; Nayeri et al., 2022; Rezaei et al., 2022; Almasieh et al., 2023; Almasieh & Mohammadi, 2023). Wildlife tourism has been partially developed to lessen conflicts between humans and animals (Treves et al., 2009; Frank, 2016). Several studies have shown that the benefits of wildlife tourism will increase the environmental awareness of villagers and reduce their hostile attitude towards wildlife (Frank, 2016; Cui et al., 2021). For instance, Mbaiwa and Stronza (2010) showed that local communities participating in tourism had stopped hunting in the Okavango Delta. In Uganda and Rwanda, sharing the profits from gorilla tourism with the local population has positively impacted the

livelihoods of people living adjacent to national parks (Archabald & Naughton-Treves, 2001). Also, Stronza and Pêgas (2008) showed that the revenue derived from ecotourism in Brazil contributed to the conservation of sea turtles despite local communities not being involved in decision-making and management. This finding demonstrates that revenue sharing can contribute to conservation.

At the same time, other studies have cast doubt on the advantages of wildlife tourism for nearby communities and conservation efforts (Coria & Calfucura, 2012; Sabuhoro et al., 2021). This issue has mainly been approached from a socio-economic perspective, with most studies concluding that the benefits of wildlife tourism are not equally distributed. While wildlife tourism positively influences people's attitudes towards conservation, its effectiveness is limited since the benefits are received unevenly by the local communities (Krüger, 2005; Coria & Calfucura, 2012). The benefits of tourism are often spent on developing local infrastructure, such as roads and bridges, rather than compensating for the damage caused by wildlife (e.g., crop raiding and livestock depredation; Munanura et al., 2016). Therefore, wildlife tourism can escalate the human-wildlife conflict. For instance, Matseketsa et al. (2018, 2019) showed that its negative side effects affect communities living near wildlife tourism activity. In contrast, Tortato et al. (2017) showed that revenue from jaguar tourism is much higher than the costs incurred by livestock depredation; the income from tourism was enough to cover the damage caused by jaguars entirely. Wildlife guides and tour operators often use food to attract wildlife to areas with human presence (Cui et al., 2021). For instance, in areas where people interact with macaques, the food subsidies provided by humans have contributed to an increase in the population of the animals and have triggered aggressive behaviors between troupes. Moreover, contact with humans has habituated the animals to human presence, causing an expansion of macaque territories into human settlements, leading to human-wildlife conflicts (Cui et al., 2021).

Given the popularity and projected growth of wildlife tourism and its controversial nature, examining the academic literature on the topic is necessary for understanding the status quo of research. In this study, we utilized bibliometric methods to (1) identify the leading countries, authors, and universities on the topic, (2) determine the trends of past and present research, and (4) determine the thematic map and evolution in the field. In the second section, we performed a systematic review using the most important papers published on human-wildlife conflict in the context of tourism. The results of this study can help researchers better understand current research hotpots and common methods in the field and determine the direction of future research.

This study can help policymakers identify effective management strategies to mitigate the adverse effects of wildlife tourism.

Material and methods

Bibliometric analyses have shown great promise as tools for quantifying patterns and trends in the literature (Raneng et al., 2022; Mohammadi et al., 2024) and have thus been applied in fields such as medical science (Chen et al., 2020), biomaterials science (Hou et al., 2019), business (Bretas & Alon, 2021), and environmental science (Jiang et al., 2019). This study aimed to review research on wildlife tourism. The Scopus database was accessed for works published between 1964 and 2022 using the following string ("wildlife tourism" OR "wildlife+tour"). In total, 2804 publications were found in the literature. Complete records and their references were extracted to be used as the bibliometric data. The research process involved five steps: (1) gathering data, (2) selecting the appropriate software, (3) analyzing the data, (4) visualizing the results, and (5) interpreting the results.

Data was collected in three stages: (1) extraction data from the Scopus database, which yielded 2804 records, including original research manuscripts, reviews, conference proceedings, chapters in books, and complete books published between 1964 and 2022; (2) importing the records into R to be analyzed using the Bibliometrix package, and (3) quality assessment to check for redundant records, spelling errors, and incomplete records. Publications that failed quality assessment were excluded from the study. The data was analyzed and visualized using Excel 2019, VOSviewer version 1.6.16, and the Bibliometrix package for R (Aria & Cuccurullo, 2017). For each record, author, country, and year of publication were directly accessed from the Scopus database (www.scopus.com/sources), and maps were created in Excel. VOSviewer was utilized to create the network of countries, journals, and keywords, including author and index keywords (van Eck & Waltman, 2010; Gao et al., 2018; Mohammadi et al., 2024).

Thematic map and evolution

Four clusters can be identified in the thematic map:

(1): Low density and centrality (emerging themes): The topics in the bottom left quadrant need further exploration due to underdevelopment or emerging subjects. These subjects enjoy limited significance across the network, and their development is slow; however, they present attractive opportunities for future research. (2) High density and low centrality (basic themes): The topics in the top right quadrant constitute the primary axes in the body of research and are central to the developments in the field. These topics enjoy high relevance across and inside networks. By

identifying and developing these topics, bibliometric studies highlight the opportunities for further investigation. (3): High density and low centrality (niche themes): Topics in the top left quadrant are internally well-connected but have limited external connections, indicating their limited significance under current circumstances. (4): High density and centrality (motor themes): Topics in the top right quadrant represent the major trends in the field and are central to the literature. They have high relevance and connectivity within and across the network. Given their centrality, bibliometric studies can shed light on their exact nature and guide future research. The thematic map determines the bubble sizes by the number of publications in which the keyword appeared (García-Lillo et al., 2023). Sankey diagrams illustrate themes and their development over time (Xiao et al., 2022). In the Sankey plot, each box corresponds to a theme, with the size of the boxes indicating frequency (Xiao et al., 2022). The lines connecting the boxes show the evolution of a theme with line thickness corresponding to link strength.

Wildlife tourism effects on human-wildlife conflict

The Scopus database was searched for records published from 1960 to 15 June 2023 using the following string: ("wildlife tourism" OR "wildlife tour" OR "wildlife ecotourism") AND ("negative effects" OR "positive effects") AND ("wildlife conservation"). With these keywords, a total of 89 relevant papers were retrieved in the form of full records and cited references. We just focused on English papers. Among the downloaded papers, only studies were used that directly addressed the human-wildlife tourism conflict. We extracted some vital information from the articles, including author/year, species name, class, level of conflict (increase/ decrease), and key findings. We defined a broad concept of conflict that covered a variety of types, including crop riding, livestock depredation, human attack, roadkill, negative attitude toward wildlife, habituation, animal stress, behavioral change, and adverse effects on habitat.

We conducted a co-occurrence analysis to determine trend topics in the human-wildlife tourism conflict. This analysis creates clusters of keywords with a high degree of co-occurrence. Keywords were considered the primary unit of analysis as they encapsulate the main themes of a publication (Verrall & Pickering, 2020). In the co-occurrence graph, node size represents frequency, and line thickness corresponds to the number of related keywords (Neff & Corley, 2009).

Results

The number of publications increased exponentially between 1964 and 2022. The number of "wildlife tourism" publications first exceeded 50 in 2003 (Fig. S1). The number of publications

grew on average by close to 10% from 1964 to 2022 (Fig. S1). The least active years were 1966 to 1969, 1971, and 1976 to 1977, while the peak occurred in 2021 with 263 papers. The average number of citations per document is 21.13, highlighting the upward trend in the significance of this field. As shown in Table 1, 2804 studies were extracted from Scopus across 1071 sources between 1964 to 2022. Overall, 7001 authors contributed to the literature on the topic. The majority of the documents were empirical research articles (n = 2124), followed by book chapters (n = 264), and reviews (n = 145). The vast majority of the records were in English (95.70), with a small minority in Chinese (29), German (29), Spanish (24), Russian (8), French (7), Persian (6), Polish (6), Portuguese (4), Japanese (1), Italian (1), Croatian (1), Swedish (1), Slovenian (1), and Ukrainian (1).

Table 1. List of 10 top countries (in terms of total link strength) publishing on wildlife tourism, as per the bibliometric analysis of 'wildlife tourism' (1964–2022).

Country	Documents	Citations	Total link strength*
USA	676	1829	599
United Kingdom	333	10205	395
Australia	445	12853	337
South Africa	215	3574	260
Canada	195	5865	199
Germany	102	2217	167
New Zealand	116	3235	124
Netherland	68	1293	100
Kenya	100	2753	95
China	107	1344	86

*Total link strength: The cumulative strength of the links of an item with other items.

The highest value for all parameters belonged to the United States (Table 1); the number of publications from the US and citations for works published by US-based researchers is considerably larger than those of any other country (Table 1). Sixty countries are represented in the collaboration network (Fig. 1).

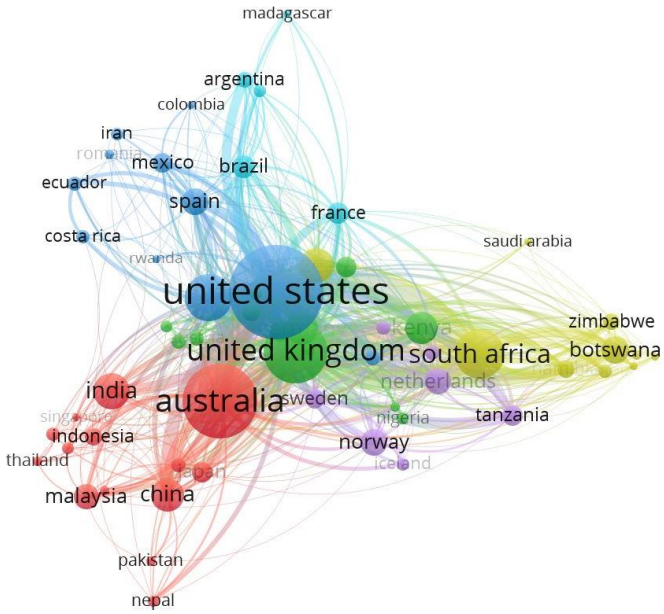

Figure 1. Co-authorship network for countries, as per bibliometric analysis of 'wildlife tourism' (1964–2022). Collaboration was identified among 60 countries/territories. The frequency of collaboration between countries is represented through the line thickness.

The colors indicate average normalized citation and work network. We found 6 significant clusters in our analysis of country networks, each containing countries that exhibited high levels of collaboration. Circle size represents the weight calculated according to total link strength. In descending order of strength, the strongest cooperation networks belong to the US, UK, Australia, and South Africa. The results also indicated that cooperation networks often involve neighboring countries. Figure 2 shows the countries with the most significant number of publications. Except for the US, UK, and Australia, the research in other countries seems to be done independently in most cases, i.e., without international collaboration. A greater number of works were published through domestic than international collaboration. Table 2 shows the 10 top researchers and institutions concerning total citations. Newsome D. (n = 22), Huveneers C. (n = 18), Deraden P. (n = 15), and Cong I. (n = 15) have published the largest number of works in this field. The most productive universities based on publications on wildlife tourism were James Cook University (n = 80), Murdoch University (n = 76), and Griffith University (n = 62; Table 2), all of which are located in Australia where the Cooperative Research Center for Sustainable Tourism was active for multiple years.

Table 2. List of 10 top researchers and universities in terms of citations, as per bibliometric analysis of 'wildlife tourism' (1964–2022).

Author	Document	Citations	Total link strength	University Name	Articles
Newsome D.	22	309	103	James Cook University	80
Huveneers C.	18	323	278	Murdoch University	76
Deraden P.	15	395	205	Griffith University	62
Cong I.	13	144	58	University of Otago	55
Ballantyne R.	10	967	145	University of Oxford	54
Packer J.	10	967	145	Wageningen University	54
Barnett A.	9	240	127	University of Botswana	52
Hughes K.	9	305	88	Beijing Forestry University	47
Rollins R.	8	233	169	University of Queensland	43
Gallagher A.G.	8	304	165	Flinders University	42

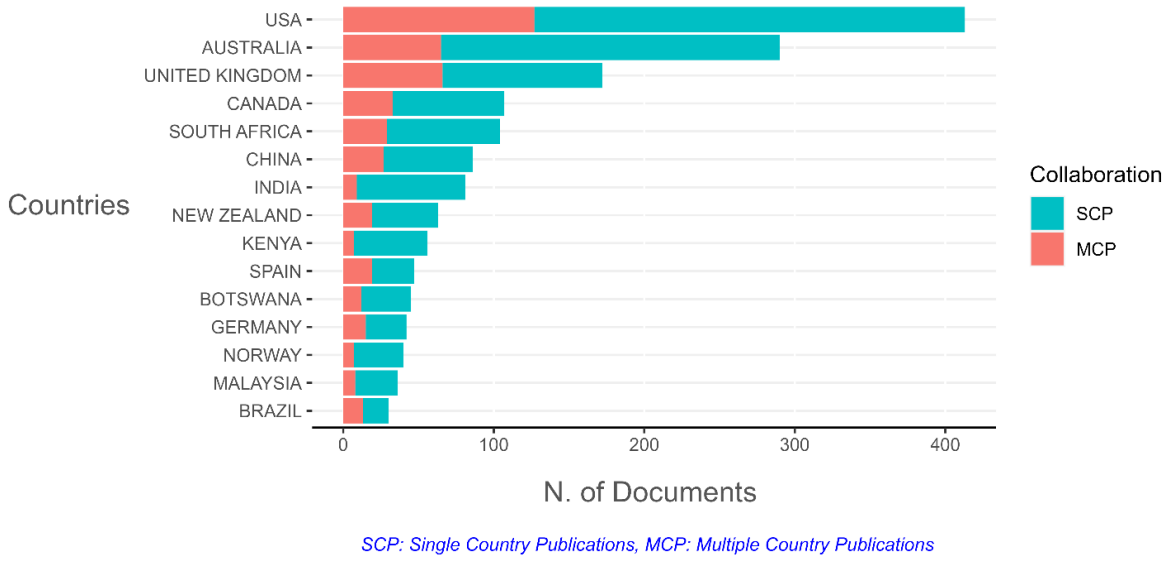

Figure 2. Nationality of the corresponding author for records in 15 top journals, as per the bibliometric analysis of 'wildlife tourism' (1964–2022). The colors red and blue, respectively, indicate multi-national and single-country authorship.

Tables S1 and S2 present a list of the most frequently used keywords in the articles' title, author, and index keywords. From 1985–2005 and 2006–2010, "tourism," "wildlife," and "ecotourism" were the most frequent keywords, while between 2011–2015 and 2016–2022, "tourism," "wildlife tourism," "wildlife," and "conservation" were the top keywords (Tables S3, S4). According to the results of the thematic map, tourism, conservation, and wildlife are the motor themes. Moreover, wildlife tourism, management, and disturbance are emerging themes that

require further development (Fig. 3). From a general perspective, "wildlife tourism" is always present. The terms "human-wildlife conflict" and "climate change" were first used in 2012–2018. In the following four years, they were further developed, and interest was sustained in the final time period of 2019–2022. Some themes, such as "ethnoprimatology" and "whale watching," have only emerged recently (Fig. 4).

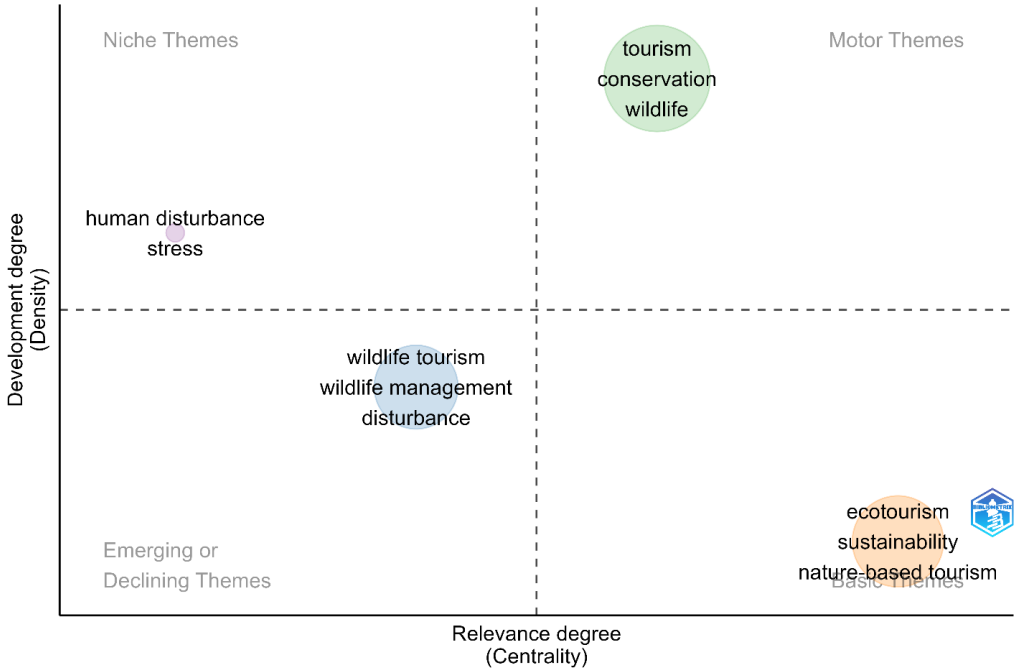

Figure 3. Thematic map in wildlife tourism research.

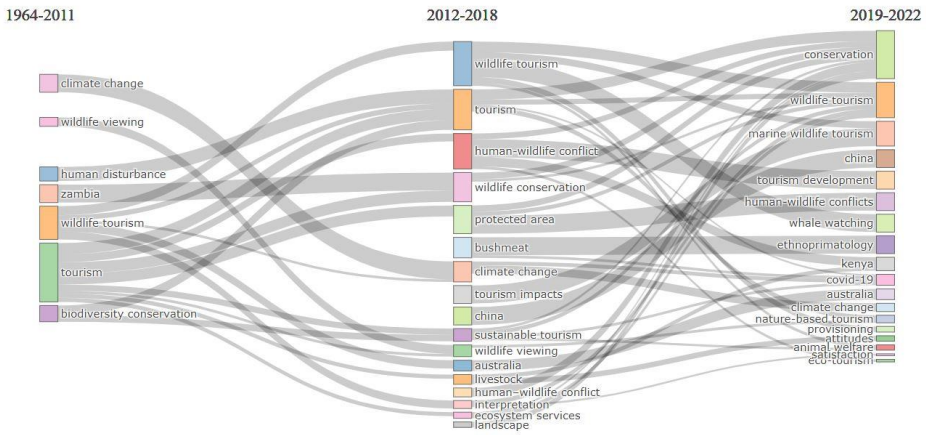

Figure 4. Thematic evolution in wildlife tourism research.

Effects of wildlife tourism on wildlife

Between 1979-2022, there are 982 articles that directly or indirectly investigated the positive or negative effects of tourist activities on wildlife. Most of these articles were published in

Biological Conservation (n = 39), Journal of Sustainable Tourism (n=32), and Tourism Management (n=30). The frequency of themes relating to "tourism", "wildlife tourism", "conservation", "ecotourism", "wildlife", "protected areas", "sustainability", "management" and, "sustainable tourism" have increased significantly, as inferred from author keywords stated between 1990 to 2022. Most of the 20 top papers (based on total citations) surveyed the negative effects of tourist activities on wildlife (Table S5).

Human-wildlife tourism conflict

We found 89 articles regarding human-wildlife tourism conflict, but only 44 published articles directly related to human-wildlife tourism conflict. Our literature showed that 54.54%, 2.27%, and 2.27% of the species studied belonged to the Mammalia, Aves, and Fish classes, respectively (Table S6). The rest of the studies were general and did not mention a specific species. Regarding the type of conflict, among the studies, behavior change (22.72%), crop riding (15.90%), livestock depredation (9.09%), habitat degradation (9.09%), attacks on humans (6.81%), and negative attitude toward species (4.54%) were investigated more. Most behavioral changes include effects on diurnal activity patterns, reproductive success, habitat use, nest success, nest predation, and foraging behavior. Africa (36.36%), Asia (27.27%), America (25%), and Europe (11.36%) have published a more significant number of studies on this topic. Most studies (56.81%) indicate that human-wildlife conflict has escalated due to wildlife tourism (Table S6).

Trend topics in the human-wildlife tourism conflict

We found annual variation in the most common keywords. "Attitude" was the most common keyword, followed by "management" in 2011, "livelihood" and "protected area" in 2014, "tourism" in 2015, "human-wildlife conflict" and "livestock" in 2017, "ecotourism" and "conflict" in 2018, "compensation" in 2019, and "wildlife tourism" and " human-wildlife conflict" in 2020 (Fig. 5). We found four research foci in the literature which also represent hot-spots in the research including (1) the attitude of local communities toward wildlife (2), wildlife tourism and human-wildlife conflict, (3) compensation and local communities' livelihoods (Fig. 6).

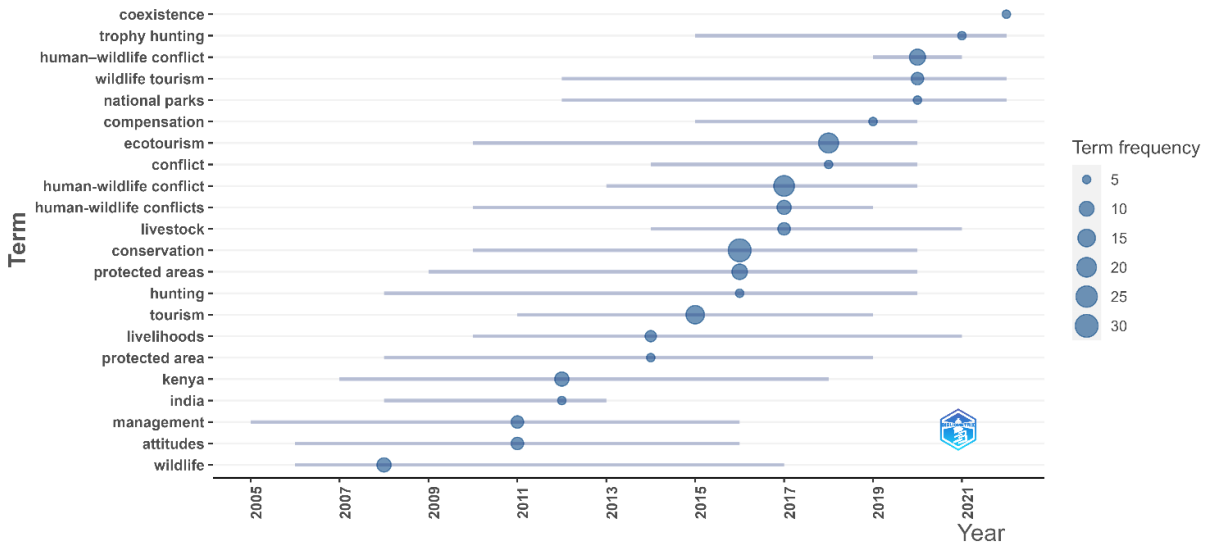

Figure 5. Trends of the most frequently used author keywords in the field of human- wildlife tourism conflict.

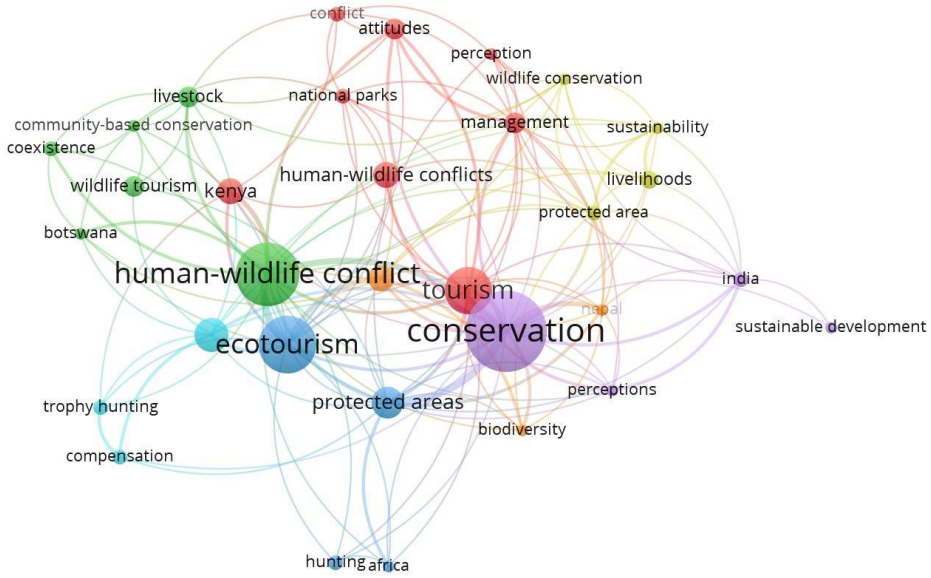

Figure 6. Three major themes in the literature are based on the 50 top research topics as defined by author keywords.

Discussion

Previous works have outlined the direction of research in wildlife tourism. Weaver and Lawton (2007) used the main themes in ecotourism to identify the main areas in ecotourism research. However, the study was conducted 16 years ago and, therefore, cannot reflect the direction of current research efforts. Ardoin et al. (2015) reviewed the literature on residential environmental education, including wildlife tourism. Other works have also utilized bibliometric methods to study ecotourism (e.g., Shasha et al., 2020; Khanra et al., 2021). However, the current study is

the only work that specifically focuses on wildlife tourism. Moreover, we have surveyed the literature published in 1964-2022, which gives our results more relevance concerning the field's status quo. The literature on the topic has grown enormously over the past 58 years, confirming the importance of wildlife tourism (Schänzel & McIntosh, 2000; Higginbottom et al., 2001; Buckley et al., 2012; Steven et al., 2013).

The term 'wildlife tourism' was introduced in the 1980s as a tool to facilitate the co-existence of humans and wildlife inside and outside of conservation areas by creating benefits for all stakeholders (i.e., local people, conservationists, tourism operators, government authorities, and wildlife; Sekhar, 2003). Although nature-based tourism has been considered an effective way to mitigate conflict among the stakeholders mentioned above, unsustainable tourism has increased concern about potential negative impacts on conflicts between stakeholders (Duffus & Deardon, 1990; Sorice et al., 2006; Larkin, 2014).

In recent years, researchers have addressed the negative effects of tourism on wildlife; however, few comprehensive studies have been dedicated to the impact of wildlife tourism on human-wildlife conflict. In order to create effective plans that maximize the benefits of wildlife tourism and minimize the risk of conflict, it is important to understand how wildlife tourism impacts conflicts between humans and animals (Kubo & Shoji, 2014). Considering the issue's importance, we examined the effects of wildlife tourism on human-wildlife conflict based on a review of 44 publications from 1983 to 2023. The discussion is presented in two main parts: Firstly, we discuss vital contributors, top journals, and research directions in the field according to bibliometric analyses. Secondly, we discuss the main impacts of wildlife tourism on human-wildlife conflict and possible strategies to mitigate these negative impacts. The frequency of themes relating to "tourism," "wildlife tourism," "conservation," "ecotourism," "wildlife," "protected areas," "sustainability," "management," and "nature-based tourism" has increased significantly, as inferred from author keywords used between 1985 and 2022 (Table S4).

Between 1964 and 2011, researchers investigating the theme of "wildlife tourism" mainly published papers on "tourism" and "wildlife tourism". However, "human-wildlife conflict" emerged as another important theme in 2012-2018. In the past four years (2019-2022), themes of "conservation" and "marine wildlife tourism" have attracted the most attention from researchers. Research on "whale watching" and "ethnoprimatology" has also flourished in recent years. In the thematic map generated by clustering, centrality, and density represent the significance of a topic, which is itself a predictor of future trends (Fig. 3). Four themes can be recognized in the thematic map, corresponding to the most relevant issues in the field. We found that "tourism", "wildlife", and "conservation" are the motor themes, indicating the contribution

of these keywords to the development of the field. “Wildlife tourism,” “wildlife management," and “disturbance” were identified as emerging fields and therefore warrant further development, especially considering that the majority of the 20 most-cited papers on the effects of tourism report that tourism negatively affects wildlife (Table S5).

Impacts of wildlife-tourism on human-wildlife conflict

We defined a broad concept of conflict that covers various conflict types, including damage to property, attacks on humans, negative attitudes toward species, road mortality, and changes in wildlife behavior, ecology, and habitats due to anthropogenic pressures. The positive impacts mainly encompassed the provision of financial resources for the conservation and sustainable management of animals and their habitats (Fennell, 1999; Goodwin et al., 1998; Wilson & Tisdell, 2001; Buckley, 2002; Zeppel & Muloin, 2007), encouraging tourists to engage in environmental activism and ambassadorship (Powell & Ham, 2008), incentivizing conservation (Higginbottom et al., 2001; Schänzel & McIntosh, 2000), and altering visitors’ behavior towards conservation and environmental ambassadorship (Medio et al., 1997; Orams & Hill, 1998). Although there is evidence that wildlife tourism has positive effects on all stakeholders (e.g., Durbin, 1999; Kiss, 2004; Kruuk, 2006; Recharte et al., 2015; Tortato et al., 2021), it could trigger human–wildlife conflict by altering animal behavior (e.g., Zhao and Deng, 1992; Buckingham et al., 1999; Heckel et al., 2003; King & Heinen, 2004; Shamir et al., 2019), food ecology (Leseberg et al., 2000; Teampanpong, 2021; Déaux et al., 2018), habitat availability and structure (e.g., Ruhlen et al. 2003; Weston & Elgar, 2005; Yasué & Dearden, 2006; Plieninger et al., 2018; Aleksandrova et al., 2021), reproductive success (Kuwaczka et al., 2023; Eagles & Haynes, 2002), energy expenditure (e.g., Abernathy; 1995), predation risk (Pampush & Anthony, 1993; Liley, 1999; Bolduc & Guillemette, 2003; Manzer & Hannon, 2005; Kuwaczka et al., 2023), thermal stress (Weston & Elgar, 2005), and species interactions (Hsu et al., 2009). Tourism might also increase retaliatory killings (Larkin, 2014), mortality due to infections and the spread of contagious diseases (Larkin, 2014), wildlife-vehicle collisions (Naciri et al., 2023), attacks on local people (Hsu et al., 2009; Barnett et al., 2022), negative attitudes toward wildlife (Onchwati et al., 2010; Larkin, 2014) and property damage (MacKenzie et al., 2017; Tortato et al., 2017; Dore et al., 2018; Aastrup et al., 2021; Braczkowski et al., 2020; Suresh et al., 2022; Matlhola et al., 2022).

Based on the literature, habituation of wildlife to anthropogenic pressures, changes in foraging behavior, and damage to property are the three main types of conflict arising from wildlife tourism. For example, Hutschenreiter et al. (2022) showed a positive correlation between

anthropogenic pressures and the number of spider monkeys (Ateles geoffroyi). Teampanpong (2021) found a direct relationship between the amount of available food waste and the number of tourists, the total number of animals, and species richness, which may make human-wildlife conflicts more likely. Déaux et al. (2018) showed that dingoes (Canis lupus dingo) exhibit greater food-related movement in the absence of fishing activity. In areas where people interact with macaques, the food subsidies provided by humans have increased the abundance of the animals and triggered aggressive behaviors. Moreover, contact with humans has habituated the animals to human presence, causing an expansion of macaque territory into human settlements, leading to human-wildlife conflicts (Cui et al., 2021). Food provisioning may make aggression among species more likely and increase the length of aggressive episodes (e.g., Hsu et al., 2009). Regarding local attitudes, several studies have assessed the effects of tourism on the attitudes of local people toward wildlife (e.g., Arjunan et al., 2006; Zimmermann et al., 2005; Bauer, 2003; Recharte et al., 2015; Weladji & Tchamba, 2003; Ohl-Schacherer et al., 2008; Stronza & Pêgas, 2008; Torres-Sovero et al., 2012).

Bateman and Fleming (2017) caution against the over-reporting of the adverse effects of tourism on wildlife, given the greater focus on the more easily measured immediate responses in the literature (especially avoidance responses). This prompts questions about the degree to which negative impacts translate from short-term reactions to more concerning long-term reactions, such as a decline in population sizes or changes in community composition. Buckley et al. (2016) lend their support to the idea that the negative effects of tourism on wildlife may have been overstated, emphasizing that the positives can overshadow the negatives in balance, particularly given that some endangered species are not threatened with extinction despite tourism in their habitats. They argue that even if tourism has detrimental effects on wildlife, the net impact can be positive due to providing financial support for species and habitat protection. Consequently, more attention must be paid to the unbiased evaluation of impacts. The development and deployment of accurate assessment methods, along with long-term monitoring, are essential to conservation. Such efforts will also enable future comparisons. Finally, wildlife tourism has been suggested as a tool to manage human-wildlife conflict (Treves et al., 2009; Watson et al., 2014), and a means to improve living conditions for local communities and to sustain livelihoods. Recent research on the topic asks whether tourism truly benefits local communities and questions the impact of tourism on perceptions and livelihoods (Coria & Calfucura, 2012). The socio-ecological impacts of wildlife tourism constitute an interesting albeit complex field for more in-depth investigation in the future.

Community-based tourism and tourist revenue sharing

According to Articles 10 and 11 of the Convention on Biological Diversity (CBD), economically and socially sound tools such as nature-based tourism can be considered sustainable incentives to local communities to support biodiversity conservation. There are some successful examples of community-based participatory ecotourism, sustainable use of wildlife resources, and conservation (Stronza & Pêgas, 2008; Kiss, 2004; MacMillan & Philip, 2008; Ohl-Schacherer et al., 2008; Torres-Sovero et al., 2012). However, in certain regions, it has been shown that tourism does not necessarily lead to increased benefits to local people and support for conservation (Bookbinder et al., 1998; Ohl-Schacherer et al., 2008; Recharte et al., 2015).

It should be noted that the success of community-based wildlife tourism depends on the direct and indirect benefits of this industry to local people and compensatory mechanisms for the costs of tourism (Kiss, 1990; Hemson et al., 2009; Larkin, 2014). Damage to local properties is one of the main triggers of human-wildlife conflict arising from nature-based tourism. Some studies have shown an increase in crop raiding or livestock depredation in areas with tourism pressure (e.g., Aastrup et al., 2021; Braczkowski et al., 2020; Suresh et al., 2022; Matlhola et al., 2022). Tourist revenue sharing (TRS) has been proposed to compensate for the damages. The contribution of TRS to local economies is one of conservationists' main hopes to increase local communities' willingness to sustainably manage wildlife (Giannecchini, 1993; Hackel, 1999; Kiss, 1990; Shogren et al., 1999). The effects of TRS on human-wildlife conflict are a matter of debate. While some studies have suggested that even limited benefit sharing can mitigate conflict (e.g. Archabald and Treves, 2001), others suggest that TRS increases tension between communities and management institutions and does not seem to lead to a significant change in how communities view wildlife (e.g., Onchwati et al., 2010). Some studies have shown that communities often do not receive benefits from TRS programs and are more likely to experience conflicts (Travers et al., 2019). According to Archabald and Treves (2001), TRS can improve local attitudes towards biodiversity conservation if successful programs' key components include sustained support by institutions, identification of target communities, transparency, accountability, and availability of sufficient financial resources. In addition, TRS programs should recognize that the local people experiencing the costs of human-wildlife coexistence are most likely to perceive conflicts. Therefore, if tourism is expected to mitigate conflicts, communities cannot be treated as homogenous groups with respect to benefit sharing. A combination of well-defined TRS policies and individual compensation programs, especially for adjacent communities, can help cover the costs of conservation and change attitudes (Archabald

& Treves, 2001; Kubo & Shoji, 2014; Recharte et al., 2015).

Strategies to mitigate the negative impact of wildlife tourism on human-wildlife conflict

The main aim of wildlife tourism is sustainability for all stakeholders. According to the literature, the relationships between tourism promoters, local people, conservationists, and wildlife can be changed from conflict to symbiosis through (1) close working relationships between all stakeholders to maximize benefits, (2) co-management and involvement of local people in wildlife-based tourism projects through information sharing, participation, revenue sharing, and local development projects, (3) expanding the current laws by defining roles, rights, responsibilities, and obligations for the stakeholders in human–wildlife conflicts, (4) development of a broad legal system that integrates international conservation frameworks, tourism, and indigenous rights, (5) building a relationship based on trust among stakeholders and decreasing bureaucratic and political problems to improve the effectiveness and continuity of local and national efforts to decrease conflict, (6) development of an independent multi-national framework to fill gaps in the existing regimes for tourism (e.g. UNWTO), human rights (e.g. ILO), and wildlife conservation (e.g. CBD), (7) facilitating private investment in areas with tourism potential in order to address the unequal distribution of benefits, (8) regulatory approaches to control the number of tourists and limit activities that attract wildlife, (9) enacting laws by government authorities to regulate or ban the provision of food to wildlife, (10) increasing the effectiveness of TRS programs by considering the most important lessons from past examples, including sustained support by institutions, identification of the target community, transparency and accountability, and adequate funding, and (11) understanding the risks associated with human-wildlife conflict to improve the management of recreation areas.

Conclusion

The current study was the first to assess the bibliometrics of wildlife tourism research using the Bibliometrix package in R and VOSviewer. It examined wildlife tourism and associated topics such as conservation, the role of communities, sustainability, tourism management, tourist behavior, protected areas, and ecology. The current study presents a comprehensive review of research on wildlife tourism. Our findings of the four thematic areas provided significant insights into previous research and indicated that “wildlife management” and “disturbance” are emerging research fields in this domain. More recently, themes emerged around “human-wildlife conflict,” “climate change,” and “ethnoprimatology.” Our literature showed that most of the wildlife tourism conflict involved wildlife behavior change, crop riding, and livestock depredation. Based

on the results, we recommend increasing interregional cooperation and using new analytical approaches to explore the interconnectivity of the aspects of wildlife tourism. Relatedly, and connected to the collaborative network analysis that we have presented earlier and the strong geographic bias towards US studies, there is a need to expand wildlife tourism research into other geographic realms and involve more research and collaborations, for instance, with developing countries where significant wildlife tourism destinations are located, and conflicts are reported. A great example is the human-elephant interactions reported in Malaysia (Sumanapala et al., 2021). These types of impacts and research are critical to be investigated more in the future. Some of the limitations in this research include: (1) This study used 2804 papers from only one database, which does not represent all of the papers published globally in this field. Therefore, the conclusion and the results should only be interpreted within the context of wildlife tourism research from this database. (2) Bibliometric analysis does not apply to literature published outside indexed journals (e.g., non-indexed journals and books) (3) Bibliometric analysis is also hampered by self-citation, inaccurate citation, and citation of second-rate works.

References

Aastrup, M. L., Sponarski, C. C., Bath, A. J., & Frenette, A. (2021). A national park in the making: Local perceptions and equity implications around a proposed national park in Romania. Society & Natural Resources, 34(10), 1358-1374.

Abernathy, B. E. (1995). Human presence and sexual activity of West Indian manatees (Trichechus manatus) at Crystal River, Florida. Unpublished master thesis, Department of Biology, Florida Atlantic University, Boca Raton, Florida.

Aleksandrova, A. Y., Bobylev, S. N., Solovyeva, S. V., & Khovavko, I. Y. (2021). Overtourism at Baikal: Problems and ways of addressing them. Geography and Natural Resources, 42, 248-257.

Almasieh, K., & Mohammadi, A. (2023). Assessing landscape suitability and connectivity for effective conservation of two semi-desert ungulates in Iran. Conservation Science and Practice, 5(12), e13047.

Almasieh, K., Zamani, N. and Piri, R. 2023. An ensemble modeling approach to predict spatial risk patches of the Persian leopard-livestock conflicts in Lorestan Province, Iran. Environmental Science and Pollution Research, 30: 93002–93013. https://doi.org/10.1007/s11356-023-28963-2 .

Archabald, K., & Naughton-Treves, L. (2001). Tourism revenue-sharing around national parks in Western Uganda: early efforts to identify and reward local communities. Environmental conservation, 28(2), 135–149.

Ardoin, N. M., Biedenweg, K., & O'Connor, K. (2015). Evaluation in residential environmental education: An applied literature review of intermediary outcomes. Applied Environmental Education & Communication, 14(1), 43-56.

Aria, M., & Cuccurullo, C. (2017). bibliometrix: An R-tool for comprehensive science mapping analysis. Journal of Informetrics, 11(4), 959-975.

Arjunan, M., Holmes, C., Puyravaud, J. P., & Davidar, P. (2006). Do developmental initiatives influence local attitudes toward conservation? A case study from the Kalakad–

Mundanthurai Tiger Reserve, India. *Journal of environmental management*, *79*(2), 188-197.

Asadi, H., Soffianian, A., Hemami, M. R., Fakheran, S., Akbari Feizabadi, H., & Corcoran, F. (2022). A hybrid GIS-OWA and DANP method for the identification and evaluation of ecotourism attractions: the case study of Abbas Abad Wildlife Refuge, Iran. GeoJournal, 87(6), 5179-5196.

Ballantyne, R., Hughes, K., Lee, J., Packer, J., & Sneddon, J. (2018). Visitors' values and environmental learning outcomes at wildlife attractions: Implications for interpretive practice. Tourism Management, 64, 190-201.

Ballantyne, R., Packer, J., & Falk, J. (2011). Visitors' learning for environmental sustainability: Testing short-and long-term impacts of wildlife tourism experiences using structural equation modelling. Tourism Management, 32(6), 1243-1252.

Ballantyne, R., Packer, J., & Hughes, K. (2009). Tourists' support for conservation messages and sustainable management practices in wildlife tourism experiences. Tourism Management, 30(5), 658–664.

Ballantyne, R., Packer, J., Hughes, K., & Dierking, L. (2007). Conservation learning in wildlife tourism settings: Lessons from research in zoos and aquariums. Environmental Education Research, 13(3), 367-383.

Barnes, J., Burgess, J., & Pearce, D. (1992). Wildlife Tourism. TM Swanson and EB Barbier (eds.). Economics for the Wilds: Wildlife, Wildlands, Diversity and Development London, UK.

Barnett, A., Fitzpatrick, R., Bradley, M., Miller, I., Sheaves, M., Chin, A., ... & Abrantes, K. (2022). Scientific response to a cluster of shark bites. People and Nature, 4(4), 963-982.

Bateman, P. W., & Fleming, P. A. (2017). Are negative effects of tourist activities on wildlife over-reported? A review of assessment methods and empirical results. Biological Conservation, 211, 10-19.

Bauer, H. (2003). Local perceptions of Waza National Park, northern Cameroon. Environmental conservation, 30(2), 175-181.

Bejder, L., Samuels, A. M. Y., Whitehead, H. A. L., Gales, N., Mann, J., Connor, R., ... & Krützen, M. (2006 a). Decline in relative abundance of bottlenose dolphins exposed to long-term disturbance. Conservation Biology, 20(6), 1791-1798.

Bejder, L., Samuels, A., Whitehead, H., & Gales, N. (2006 b). Interpreting short-term behavioural responses to disturbance within a longitudinal perspective. Animal Behaviour, 72(5), 1149-1158.

Bolduc, F., & Guillemette, M. (2003). Human disturbance and nesting success of Common Eiders: interaction between visitors and gulls. *Biological Conservation*, *110*(1), 77-83.

Bookbinder, M. P., Dinerstein, E., Rijal, A., Cauley, H., & Rajouria, A. (1998). Ecotourism's support of biodiversity conservation. Conservation Biology, *12*(6), 1399-1404.

Braczkowski, A., Fattebert, J., Schenk, R., O'Bryan, C., Biggs, D., & Maron, M. (2020). Evidence for increasing human-wildlife conflict despite a financial compensation scheme on the edge of a Ugandan National Park. Conservation Science and Practice, 2(12), e309.

Bretas, V. P., & Alon, I. (2021). Franchising research on emerging markets: Bibliometric and content analyses. Journal of Business Research, 133, 51-65.

Buckingham, C. A., Lefebvre, L. W., Schaefer, J. M., & Kochman, H. I. (1999). Manatee response to boating activity in a thermal refuge. Wildlife Society Bulletin, 514-522.

Buckley, R. (2002). Tourism and biodiversity in north and south. Tourism Recreation Research, 27(1), 43e51.

Buckley, R. C., Castley, J. G., Pegas, F. D. V., Mossaz, A. C., & Steven, R. (2012). A population accounting approach to assess tourism contributions to conservation of IUCN-redlisted mammal species.

Buckley, R. C., Morrison, C., & Castley, J. G. (2016). Net effects of ecotourism on threatened species survival. PloS one, 11(2), e0147988.

Chen, S., Lu, Q., Bai, J., Deng, C., Wang, Y., Zhao, Y., 2020. Global publications on stigma between 1998–2018: a bibliometric analysis. J. Affect. Disord. 274, 363–371.

Cong, L., Wu, B., Morrison, A. M., Shu, H., & Wang, M. (2014). Analysis of wildlife tourism experiences with endangered species: An exploratory study of encounters with giant pandas in Chengdu, China. Tourism management, pp. 40, 300–310.

Coria, J., & Calfucura, E. (2012). Ecotourism and the development of indigenous communities: The good, the bad, and the ugly. Ecological Economics, 73, 47-55.

Cui, Q., Ren, Y., & Xu, H. (2021). The escalating effects of wildlife tourism on human-wildlife conflict. Animals, 11(5), 1378.

Curtin, S. (2013). Lessons from Scotland: British wildlife tourism demand, product development and destination management. Journal of Destination Marketing & Management, 2(3), 196–211.

Curtin, S., & Kragh, G. (2014). Wildlife tourism: Reconnecting people with nature. Human dimensions of wildlife, 19(6), 545–554.

Déaux, E. C., Crowe, T., & Charrier, I. (2018). Recreational fishing alters dingo foraging behavior on Fraser Island. The Journal of Wildlife Management, 82(1), 85-92.

Dore, K. M., Eller, A. R., & Eller, J. L. (2018). Identity construction and symbolic association in farmer-vervet monkey (*Chlorocebus aethiops sabaeus*) interconnections in St. Kitts. Folia Primatologica, 89(1), 63-80.

Duffus, D. A., & Dearden, P. (1990). Non-consumptive wildlife-oriented recreation: A conceptual framework. Biological Conservation, *53*(3), 213–231.

Durbin, K. (1999). *Tongass:* Pulp politics and the fight for the Alaska rain forest. Oregon State University Press.

Eagles, P. F., McCool, S. F., & Haynes, C. D. (2002). *Sustainable tourism in protected areas:* Guidelines for planning and management (No. 8). Iucn.

Fennell, D. (1999). Ecotourism: An introduction. London: Routledge. Goodwin, H., Kent, I., Parker, K., & Walpole, M. (1998). Tourism, conservation and sustainable development. IIED wildlife and development series no 12.

Frank, B. (2016). Human-wildlife conflicts and the need to include tolerance and coexistence: An introductory comment. Society & Natural Resources, 29(6), 738–743.

GAO, Y., XU, Y., ZHU, Y., & ZHANG, J. (2018). An analysis of the hotspot and frontier of mine eco-environment restoration based on big data visualization of VOSviewer and CiteSpace. Geological Bulletin of China, 37(12), 2144–2153.

García-Lillo, F., Sánchez-García, E., Marco-Lajara, B., & Seva-Larrosa, P. (2023). Renewable Energies and Sustainable Development: A Bibliometric Overview. Energies, 16(3), 1211.

Geffroy, B., Samia, D. S., Bessa, E., & Blumstein, D. T. (2015). How nature-based tourism might increase prey vulnerability to predators. Trends in Ecology & Evolution, 30(12), 755-765.

Giannecchini, J. (1993). Ecotourism: new partners, new relationships. Conservation Biology, 7(2), 429-432.

Goodwin, H., Kent, I., Parker, K., & Walpole, M. (1998). Tourism, conservation and sustainable development. IIED wildlife and development series no 12.

Green, R. J., & Higginbottom, K. (2000). The effects of non-consumptive wildlife tourism on free-ranging wildlife: a review. Pacific Conservation Biology, 6(3), 183–197.

Hackel, J. D. (1999). Community conservation and the future of Africa's wildlife. Conservation Biology, *13*(4), 726-734.

Heckel, G., Espejel, I., & Fischer, D. W. (2003). Issue definition and planning for whale watching management strategies in Ensenada, Mexico. Coastal Management, 31(3), 277–296.

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

Higginbottom, K., & Scott, N. (2004). Wildlife Tourism: a strategic destination analysis. Wildlife Tourism: Planning, Impacts and Management, edited by K. Higginbottom. Melbourne: Common Ground and Cooperative Research Centre for Sustainable Tourism, pp. 253-77.

Higginbottom, K., Northrope, C. L., & Green, R. J. (2001). Positive effects of wildlife tourism on wildlife. Wildlife Tourism research report no. 6, Status assessment of wildlife tourism in Australia series. Gold Coast, Queensland: CRC for Sustainable Tourism.

Schänzel, H. A., & McIntosh, A. J. (2000). An insight into the personal and emotive context of wildlife viewing at the penguin place, Otago Peninsula, New Zealand. Journal of Sustainable Tourism, 8(1), 36e52.

Hou, D., Bi, X., Mao, Z., Fan, Y., Hu, X., & Li, X. (2019). Biomaterials research of China from 2013 to 2017 based on bibliometrics and visualization analysis. PeerJ, 7, e6859.

Hsu, M. J., Kao, C. C., & Agoramoorthy, G. (2009). Interactions between visitors and Formosan macaques (Macaca cyclopis) at Shou-Shan Nature Park, Taiwan. *American Journal of* Primatology: Official Journal of the American Society of Primatologists, *71*(3), 214–222.

Hughes, K., Packer, J., & Ballantyne, R. (2011). Using post-visit action resources to support family conservation learning following a wildlife tourism experience. Environmental Education Research, 17(3), 307-328.

Hutschenreiter, A., Kalan, A. K., Bonilla Moheno, M., Morales Mávil, J. E., Mandujano, S., Briseño Jaramillo, M., ... & Aureli, F. (2022). Spider monkeys (Ateles geoffroyi) habituate to anthropogenic pressure in a low-impact tourism area: insights from a multi-method approach. International Journal of Primatology, 43(5), 946-964.

Jiang, M., Huo, Y., Huang, K., & Li, M. (2019). Way forward for straw burning pollution research: a bibliometric analysis during 1972–2016. Environmental Science and Pollution Research, 26(14), 13948-13962.

Khanra, S., Dhir, A., Kaur, P., & Mäntymäki, M. (2021). Bibliometric analysis and literature review of ecotourism: Toward sustainable development. Tourism Management Perspectives, 37, 100777.

King, J. M., & Heinen, J. T. (2004). An assessment of the behaviors of overwintering manatees as influenced by interactions with tourists at two sites in central Florida. *Biological Conservation*, *117*(3), 227-234.

Kiss, A. (1990). Living with wildlife: wildlife resource management with local participation in Africa. *(No Title)*.

Kiss, A. (2004). Is community-based ecotourism a good use of biodiversity conservation funds?. *Trends in ecology & evolution*, *19*(5), 232-237.

Krüger, O. (2005). The role of ecotourism in conservation: panacea or Pandora's box?. Biodiversity & Conservation, pp. 14, 579-600.

Kruuk, H. (2006). Otters: ecology, behaviour and conservation. Oxford University Press, USA.

Kubo, T., & Shoji, Y. (2014). Spatial tradeoffs between residents' preferences for brown bear conservation and the mitigation of human–bear conflicts. Biological Conservation, *176*, 126-132.

Kuwaczka, L. F., Mitterwallner, V., Audorff, V., & Steinbauer, M. J. (2023). Ecological impacts of (electrically assisted) mountain biking. Global Ecology and Conservation, e02475.

Larkin, L. R. (2014). Human-Wildlife Conflict in Maasai Mara National Reserve: Demonstrating the Need for an International Framework on Wildlife-based Tourism. Journal of International Wildlife Law & Policy, 17(1), 1-31.

Leseberg, A., Hockey, P. A., & Loewenthal, D. (2000). Human disturbance and the chick-rearing ability of African black oystercatchers (Haematopus moquini): a geographical perspective. Biological Conservation, *96*(3), 379-385.

Liley, D. (1999). Predicting the consequences of human disturbance, predation and sea-level rise for Ringed Plover populations (Doctoral dissertation, Anglia Polytechnic University).

MacKenzie, C. A., Salerno, J., Hartter, J., Chapman, C. A., Reyna, R., Tumusiime, D. M., & Drake, M. (2017). Changing perceptions of protected area benefits and problems around Kibale National Park, Uganda. Journal of Environmental Management, 200, 217-228.

MacMillan, D. C., & Phillip, S. (2008). Consumptive and non-consumptive values of wild mammals in Britain. Mammal Review, *38*(2-3), 189-204.

Magige, J. M., Jepkosgei, C., & Onywere, S. M. (2020). Use of GIS and remote sensing in tourism. Handbook of e-Tourism, 1-27.

Manzer, D. L., & Hannon, S. J. (2005). Relating grouse nest success and corvid density to habitat: a multi-scale approach. The Journal of Wildlife Management, *69*(1), 110-123.

Martin, J. G., & Réale, D. (2008). Animal temperament and human disturbance: implications for the response of wildlife to tourism. Behavioural Processes, 77(1), 66-72.

Matlhola, D. M., Kgathi, D. L., & Mmopelwa, G. (2022). Tourists' perceptions and consumer surplus at a UNESCO World Heritage Site, the Okavango Delta, Botswana: Implications for rural development. Development Southern Africa, 39(2), 271-287.

Matseketsa, G., Chibememe, G., Muboko, N., Gandiwa, E., & Takarinda, K. (2018). Towards an understanding of conservation-based costs, benefits, and attitudes of local people living adjacent to Save Valley Conservancy, Zimbabwe. Scientifica, 2018.

Matseketsa, G., Muboko, N., Gandiwa, E., Kombora, D. M., & Chibememe, G. (2019). An assessment of human-wildlife conflicts in local communities bordering the western part of Save Valley Conservancy, Zimbabwe. Global Ecology and Conservation, 20, e00737.

Mbaiwa, J. E. (2003). The socio-economic and environmental impacts of tourism development on the Okavango Delta, north-western Botswana. Journal of Arid Environments, 54(2), 447-467.

Mbaiwa, J. E., & Stronza, A. L. (2010). The effects of tourism development on rural livelihoods in the Okavango Delta, Botswana. Journal of sustainable tourism, 18(5), 635-656.

McClung, M. R., Seddon, P. J., Massaro, M., & Setiawan, A. N. (2004). Nature-based tourism impacts on yellow-eyed penguins Megadyptes antipodes: Does unregulated visitor access affect fledging weight and juvenile survival? Biological Conservation, 119(2), 279-285.

Medio, D., Ormond, R. F. G., & Pearson, M. (1997). Effect of briefings on rates of damage to corals by SCUBA divers. Biological Conservation, 79, 91e95.

Meyer, L., Whitmarsh, S. K., Nichols, P. D., Revill, A. T., & Huveneers, C. (2020). The effects of wildlife tourism provisioning on non-target species. Biological Conservation, 241, 108317.

Mohammadi, A., Alambeigi, A., & Steven, R. (2024). A bibliometric analysis of 44 years of research on birdwatching tourism research: An exploration for emerging insights: A bibliometric analysis of 44 years of research on birdwatching tourism research. Journal of Wildlife and Biodiversity, 8(1), 213–232.

Mohammadi, A., Alambeigi, A., López-Bao, J. V., & Kaboli, M. (2021b). Fear of wolves in relation to attacks on people and livestock in Western Iran. Anthrozoös, 34(2), 303-319.

Mohammadi, A., Alambeigi, A., López-Bao, J. V., Taghavi, L., & Kaboli, M. (2022a). Living with Wolves: Lessons learned from Iran. Conservation Science and Practice, 4(5), e12667.

Mohammadi, A., Kaboli, M., Sazatornil, V., & López-Bao, J. V. (2019). Anthropogenic food resources sustain wolves in conflict scenarios of Western Iran. PloSone, 14(6), e0218345.

Mohammadi, A., Lunnon, C., Moll, R. J., Tan, C. K. W., Hobeali, K., Behnoud, P., ... & Farhadinia, M. S. (2021a). Contrasting responses of large carnivores to land use management across an Asian montane landscape in Iran. Biodiversity and Conservation, 30, 4023–4037.

Müllner, A., Linsenmair, K. E., & Wikelski, M. (2004). Exposure to ecotourism reduces survival and affects stress response in hoatzin chicks (*Opisthocomus hoazin*). Biological Conservation, 118(4), 549-558.

Munanura, I. E., Backman, K. F., Hallo, J. C., & Powell, R. B. (2016). Perceptions of tourism revenue sharing impacts on Volcanoes National Park, Rwanda: A Sustainable Livelihoods framework. Journal of Sustainable Tourism, 24(12), 1709-1726.

Murray, M. H., Becker, D. J., Hall, R. J., & Hernandez, S. M. (2016). Wildlife health and supplemental feeding: a review and management recommendations. Biological Conservation, pp. 204, 163–174.

Mustika, P. L. K., Birtles, A., Everingham, Y., & Marsh, H. (2013). The human dimensions of wildlife tourism in a developing country: watching spinner dolphins at Lovina, Bali, Indonesia. Journal of Sustainable Tourism, 21(2), 229–251.

Naciri, M., Planillo, A., Gicquel, M., East, M. L., Hofer, H., Metzger, S., & Benhaiem, S. (2023). Three decades of wildlife-vehicle collisions in a protected area: Main roads and long-distance commuting trips to migratory prey increase spotted hyena roadkills in the Serengeti. Biological Conservation, 279, 109950.

Nayeri, D., Mohammadi, A., Hysen, L., Hipólito, D., Huber, D., & Wan, H. Y. (2022). Identifying human-caused mortality hotspots to inform human-wildlife conflict mitigation. Global Ecology and Conservation, 38, e02241.

Neff, M., & Corley, E. (2009). 35 years and 160,000 articles: A bibliometric exploration of the evolution of ecology. Scientometrics, 80(3), 657–682.

Newsome, D., Rodger, K., Pearce, J., & Chan, K. L. J. (2019). Visitor satisfaction with a key wildlife tourism destination within the context of a damaged landscape. Current Issues in Tourism, 22(6), 729–746.

Ohl-Schacherer, J., Mannigel, E., Kirkby, C., Shepard, G. H., & Yu, D. W. (2008). Indigenous ecotourism in the Amazon: a case study of 'Casa Matsiguenka'in Manu National Park, Peru. *Environmental Conservation*, *35*(1), 14-25.

Okello, M. M., & Yerian, S. (2009). Tourist satisfaction in relation to attractions and implications for conservation in the protected areas of the Northern Circuit, Tanzania. Journal of sustainable tourism, 17(5), 605-625.

Onchwati, J., Sommerville, H., & Brockway, N. (2010). Sustainable Tourism Development in the Masai Mara National Reserve, Kenya, East Africa. *WIT Trans. Ecol. Environ*, *139*, 319-330.

Orams, M. B. (2002). Feeding wildlife as a tourism attraction: a review of issues and impacts. Tourism Management, 23(3), 281–293.

Orams, M. B., & Hill, G. (1998). Controlling the ecotourist in a wild dolphin feeding program: is education the answer? The Journal of Environmental Education, 29(3), 33e38.

Packer, J., Ballantyne, R., & Hughes, K. (2014). Chinese and Australian tourists' attitudes to nature, animals and environmental issues: Implications for the design of nature-based tourism experiences. Tourism Management, 44, 101–107.

Pampush, G. J., & Anthony, R. G. (1993). Nest success, habitat utilization and nest-site selection of Long-billed Curlews in the Columbia Basin, Oregon. *The Condor*, *95*(4), 957-967.

Plieninger, T., av Rana, H. Á., Fagerholm, N., Ellingsgaard, G. F., Magnussen, E., Raymond, C. M., ... & Verbrugge, L. N. (2018). Identifying and assessing the potential for conflict

between landscape values and development preferences on the Faroe Islands. Global Environmental Change, 52, 162-180.

Powell, R. B., & Ham, S. H. (2008). Can ecotourism interpretation really lead to proconservation knowledge, attitudes and behavior? Evidence from the Galapagos Islands. Journal of Sustainable Tourism, 16(4), 467e489.

Raneng, J., Howes, M., & Pickering, C. M. (2023). Current and future directions in research on community gardens. Urban Forestry & Urban Greening, 79, 127814.

Recharte, M., Bride, I. G., & Bowler, M. (2015). A recovering flagship: giant otters, communities and tourism in northern Peru. Wildlife Research, 41(6), 490–498.

Reynolds, P. C., & Braithwaite, D. (2001). Towards a conceptual framework for wildlife tourism. Tourism Management, 22(1), 31–42.

Rezaei, S., Mohammadi, A., Bencini, R., Rooney, T., & Naderi, M. (2022). Identifying connectivity for two sympatric carnivores in human-dominated landscapes in central Iran. Plos one, 17(6), e0269179.

Rodger, K., Moore, S. A., & Newsome, D. (2007). Wildlife tours in Australia: Characteristics, the place of science and sustainable futures. Journal of Sustainable Tourism, 15(2), 160–179.

Ruhlen, T. D., Abbott, S., Stenzel, L. E., & Page, G. W. (2003). Evidence that human disturbance reduces Snowy Plover chick survival. *Journal of Field Ornithology*, *74*(3), 300-304.

Sabuhoro, E., Wright, B., Munanura, I. E., Nyakabwa, I. N., & Nibigira, C. (2021). The potential of ecotourism opportunities to generate support for mountain gorilla conservation among local communities neighboring Volcanoes National Park in Rwanda. Journal of Ecotourism, 20(1), 1-17.

Sekhar, N. U. (2003). Local people's attitudes towards conservation and wildlife tourism around Sariska Tiger Reserve, India. Journal of Environmental Management, 69(4), 339-347.

Semeniuk, C. A., Haider, W., Cooper, A., & Rothley, K. D. (2010). A linked model of animal ecology and human behavior for the management of wildlife tourism. Ecological Modelling, 221(22), 2699-2713.

Shamir, Z. Z., Shamir, S. Z., Becker, N., Scheinin, A., & Tchernov, D. (2019). Evidence of the impacts of emerging shark tourism in the Mediterranean. Ocean & Coastal Management, 178, 104847.

Shasha, Z. T., Geng, Y., Sun, H. P., Musakwa, W., & Sun, L. (2020). Past, current, and future perspectives on eco-tourism: A bibliometric review between 2001 and 2018. Environmental Science and Pollution Research, 27(19), 23514-23528.

Shogren, J. F., Tschirhart, J., Anderson, T., Ando, A. W., Beissinger, S. R., Brookshire, D., ... & Polasky, S. (1999). Why economics matters for endangered species protection. *Conservation biology*, *13*(6), 1257-1261.

Smith, J. R., Lindborg, R. J., Hernandez, V., Abney, E. A., & Witherington, B. E. (2021). Using behavior indices and vital rates to determine the conservation impact of wildlife tourism: Guided sea turtle watch programs in Florida. Global Ecology and Conservation, 27, e01537.

Sorice, M. G., Shafer, C. S., & Ditton, R. B. (2006). Managing endangered species within the use–preservation paradox: The Florida manatee (*Trichechus manatus latirostris*) as a tourism attraction. Environmental Management, 37, 69–83.

Steven, R., Castley, J. G., & Buckley, R. (2013). Tourism revenue as a conservation tool for threatened birds in protected areas. PloS one, 8(5), e62598.

Steven, R., Pickering, C., & Castley, J. G. (2011). A review of the impacts of nature-based recreation on birds. Journal of Environmental Management, 92(10), 2287–2294.

Stronza, A., & Pêgas, F. (2008). Ecotourism and conservation: Two cases from Brazil and Peru. *Human Dimensions of Wildlife*, *13*(4), 263-279.

Sumanapala, D., Galahitiiyawe, N. W., & Wolf, I. D. (2021). Conservation-Based Elephant Tourism: An Importance–Performance Analysis. In E. Laws, E. Scott, X. Font, & J. Koldowski (Eds.), The Elephant Tourism Business: International Problems and Progress: CABI Publishing.

Suresh, K., Wilson, C., Quayle, A., Managi, S., & Khanal, U. (2022). Can a tourist levy protect national park resources and compensate for wildlife crop damage? An empirical investigation. Environmental Development, p. 42, 100697.

Teampanpong, J. (2021). Improper garbage management attracts vertebrates in a Thai national park. Écoscience, 28(2), 107-113.

Thiel, D., Jenni-Eiermann, S., Braunisch, V., Palme, R., & Jenni, L. (2008). Ski tourism affects habitat use and evokes a physiological stress response in capercaillie Tetrao urogallus: a new methodological approach. Journal of Applied Ecology, 45(3), 845-853.

Torres-Sovero, C., González, J. A., Martín-López, B., & Kirkby, C. A. (2012). Social-ecological factors influencing tourist satisfaction in three ecotourism lodges in the southeastern Peruvian Amazon. Tourism Management, *33*(3), 545-552.

Tortato, F. R., Hoogesteijn, R., Devlin, A. L., Quigley, H. B., Bolzan, F., Izzo, T. J., ... & Peres, C. A. (2021). Reconciling biome-wide conservation of an apex carnivore with land-use economics in the increasingly threatened Pantanal wetlands. Scientific Reports, *11*(1), 22808.

Tortato, F. R., Izzo, T. J., Hoogesteijn, R., & Peres, C. A. (2017). The numbers of the beast: Valuation of jaguar (Panthera onca) tourism and cattle depredation in the Brazilian Pantanal. Global ecology and conservation, 11, 106-114.

Travers, H., Archer, L. J., Mwedde, G., Roe, D., Baker, J., Plumptre, A. J., ... & Milner-Gulland, E. J. (2019). Understanding complex drivers of wildlife crime to design effective conservation interventions. Conservation Biology, 33(6), 1296-1306.

Treves, A., Wallace, R. B., & White, S. (2009). Participatory planning of interventions to mitigate human-wildlife conflicts. Conservation biology, 23(6), 1577-1587.

Van Eck, N., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. scientometrics, 84(2), 523-538.

Verrall, B., & Pickering, C. M. (2020). Alpine vegetation in the context of climate change: A global review of past research and future directions. Science of the Total Environment, 748, 141344.

Walker, B. G., Dee Boersma, P., & Wingfield, J. C. (2006). Habituation of adult Magellanic penguins to human visitation as expressed through behavior and corticosterone secretion. Conservation Biology, 20(1), 146-154.

Walpole, M. J., & Thouless, C. R. (2005). Increasing the value of wildlife through non-consumptive use? Deconstructing the myths of ecotourism and community-based tourism in the tropics. Conservation Biology Series-Cambridge, pp. *9*, 122.

Watson, J. E., Dudley, N., Segan, D. B., & Hockings, M. (2014). The performance and potential of protected areas. Nature, 515(7525), 67–73.

Weaver, D. B., & Lawton, L. J. (2007). Twenty years on the state of contemporary ecotourism research. Tourism Management, 28(5), 1168–1179.

Weladji, R. B., & Tchamba, M. N. (2003). Conflict between people and protected areas within the Bénoué Wildlife Conservation Area, North Cameroon. Oryx, *37*(1), 72-79.

Weston, M. A., & Elgar, M. A. (2005). Disturbance to brood-rearing Hooded Plover *Thinornis rubricollis*: responses and consequences. Bird Conservation International, 15(2), 193-209.

Wilson, C., & Tisdell, C. (2001). Sea turtles as a non-consumptive tourism resource especially in Australia. Tourism Management, 22, 279e288.

Wilson, C., & Tisdell, C. (2003). Conservation and economic benefits of wildlife-based marine tourism: sea turtles and whales as case studies. Human Dimensions of Wildlife, 8(1), 49-58.

Wunder, S. (2000). Ecotourism and economic incentives—an empirical approach. Ecological Economics, 32(3), 465-479.

Xiao, Z., Qin, Y., Xu, Z., Antucheviciene, J., & Zavadskas, E. K. (2022). The journal Buildings: A bibliometric analysis (2011–2021). Buildings, 12(1), 37.

Yasué, M., & Dearden, P. (2006). The potential impact of tourism development on habitat availability and productivity of Malaysian plovers *Charadrius peronii*. Journal of Applied Ecology, *43*(5), 978-989.

Zeppel, H., & Muloin, S. (2007). Marine wildlife tours: benefits for participants. In J. Higham, & M. Lück (Eds.), Marine wildlife and tourism management: Insights from the natural and social sciences (pp. 19e48). Wallingford, Oxfordshire: CABI.

Zhao, Q. K., & Deng, Z. Y. (1992). Dramatic consequences of food handouts to *Macaca thibetana* at Mount Emei, China. Folia Primatologica, *58*(1), 24-31.

Zimmermann, A., Walpole, M. J., & Leader-Williams, N. (2005). Cattle ranchers' attitudes to conflicts with jaguar Panthera onca in the Pantanal of Brazil. Oryx, *39*(4), 406-412.