#OLDNEWS: DIFFUSION OF PRO-CONSERVATION BEHAVIORS AND SOCIAL MEDIA
IN WILDLIFE TOURISM

by

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Wildlife tourism, i.e., tourism that involves interactions with wildlife, is extremely popular and can occur in *in situ* (e.g., parks and protected areas) or *ex situ* (e.g., zoos and aquariums) settings. Annually, more than 12 million trips are taken for wildlife tourism purposes across the globe, and over 4 million people visit wildlife tourism venues in Eastern North Carolina alone. Wildlife tourism has been justified on the grounds that it produces a net-positive impact on wildlife conservation by encouraging tourists to participate in pro-conservation behaviors (PCB). Because tourists may hold unique feelings towards individual PCB, it is important to understand how wildlife tourists' perceived efficacy of PCB (PEPCB) varies amongst behaviors. It is also important to understand how experiential and personality factors influence the formation of PEPCB. However, empirical data on the factors that influence wildlife tourists' PEPCB are lacking. This study used the Diffusion of Innovations model to explore (a) how engagement with interpretation, attitudes, and past participation in PCB influence tourists' perceived efficacy of PCB , and (b) the role of social media as an emerging PCB. Tourists (N = 475) at seven wildlife tourism venues across North Carolina were surveyed. Engagement with interpretation, attitudes, and past participation in PCB were found to have no influence on perceived efficacy of PCB. Posting on social media emerged as a unique PCB in this study, and

past participation in this behavior significantly increased perceptions of its efficacy. Results indicate that PCB may be diffused throughout the community; the only exception are PCB related to social media, which may still be considered innovations and warrant further study.

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MEDIA IN WILDLIFE TOURISM

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by

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Chapter 1 – Introduction

BACKGROUND

Wildlife tourism is a highly popular activity, with over 4 million wildlife tourists annually visiting destinations in Eastern North Carolina alone. Wildlife tourism is a subset of nature-based tourism, which is tourism that focuses on interactions with wild natural resources (Fennell, 2015). Wildlife tourism can occur in a variety of settings, including *in situ* settings such as wildlife refuges and *ex situ* settings such as zoos and aquariums (Higginbottom, 2004) Some wildlife tourism experiences involve a sustainability component, such as educational programs and encouraging tourists to participate in pro-conservation behaviors (Kline, 2001).

In order to justify wildlife tourism experiences, it has been noted that positive impacts should outweigh negative impacts, creating a net positive impact for conservation. This is often achieved because wildlife tourism experiences encourage tourists to participate in proconservation behaviors (PCB). In fact, simply engaging with wildlife tourism has been linked with greater PCB participation (Apps et al., 2018; Dearden et al., 2007; Tisdell & Wilson, 2002). PCB represent specific actions tourists can perform either on-site or at home which benefit wildlife and the environment. Examples of tourist-based PCB include volunteering, philanthropy, making wildlife-friendly purchasing decisions, and advocating for wildlife (Apps et al., 2018; Dearden et al., 2007; Rattan et al., 2012). Although a variety of PCB are discussed in the literature, few articles discuss how tourists' perceived efficacy of PCB (PEPCB) vary.

A few characteristics of tourists may influence tourists' PEPCB. Past wildlife tourism experiences may influence PEPCB. Experiences with wildlife can influence psychological constructs of wildlife tourists (Skibins et al., 2013), increase PCB performance (Apps et al., 2018), and motive tourists' behavior change (Ardoin et al., 2015). Environmental Identity (EID)

scores measure respondents' connection to the natural world, and EID is a stable construct over time (Clayton, 2003; Clayton et al., 2011). A person's EID score has been shown to relate positively to environmental behaviors (Clayton, 2003), pro-conservation intentions (Clark et al., 2019), and PCB participation (Dresner et al., 2015).

Onsite experiences may influence tourists' PEPCB; specifically, interpretation may influence tourists' perceptions of efficacy. Engagement with interpretation onsite during a wildlife tourism experience has been shown to change tourists' behaviors (Orams, 1996), increase pro-conservation attitudes (Moscardo et al., 2004), and generally increase support for conservation (Higginbottom et al., 2003). Therefore, this study's primary objective is to investigate the role that past performance of PCB, attitudes (via EID), and engagement with interpretation play on wildlife tourists' PEPCB using a modified version of the Diffusion of Innovations model (Rogers, 2003).

Social media and other online platforms are a growing source of information for wildlife tourists. Social media can be used as a source of information for tourists prior to and during their visit (Del Chiappa, 2011; Fotis et al., 2010; Kim et al., 2015). It can also serve to keep tourists connected to the site after returning home (Ardoin et al., 2015; Ballantyne et al., 2011; Scott & Harmon, 2016). It has been noted that posting on social media either while onsite or after the visit can serve as a new way for tourists to share about their experiences and receive immediate feedback from others about their experiences (Boley et al., 2018; Munar & Jacobsen, 2014; Scott & Harmon, 2016). However, research on the impact of social media on wildlife tourism is in its infancy. This study investigates how social media functions as a PCB in relation to the wildlife tourism experience.

This study will utilize a modified version of Rogers' (Rogers, 2003) Diffusion of Innovation model (see Figure 2) to show factors that influence tourists' PEPCB. The model has three main stages: Knowledge, Persuasion, and Decision. In this study, Knowledge is influenced by tourists' attitudes as assessed by EID, a Receiver Variable, and engagement with onsite interpretation, a Social System Variable. Persuasion is assessed by past performance of PCB, a factor of Perceived Characteristics of Innovations. The Decision phase is assessed here by PEPCB.

Data for this study were collected via post-visit quantitative surveys administered to wildlife tourists at seven North Carolina wildlife venues. Study sites included both *in situ* and *ex situ* venues to provide comparisons and a systems-level view of wildlife tourism in North Carolina. *Ex situ* sites were the North Carolina Zoo, North Carolina Aquariums at Roanoke Island, Pine Knoll Shores, and Fort Fisher, and Sylvan Heights Bird Park. *In situ* surveys were collected at Pea Island National Wildlife Refuge and Alligator River National Wildlife Refuge. 450 total surveys were collected during July and August of 2019.

RESEARCH QUESTIONS

This study was designed to answer the following two main research questions:

1. What is the influence of wildlife tourists' attitudes (i.e., EID) (Receiver Variable: Personality Characteristics), engagement with onsite interpretation (Social System Variable: Communication Integration), and past performance of PCB (Perceived Characteristics of Innovations: Trialability) on PEPCB (Decisions III)?

2. How does social media function as a PCB within the context of a wildlife tourism experience?

    a. Specifically, when across their visit do tourists visit websites/social media to learn or post about their experiences?

    b. How does social media use relate to PCB participation?

PROBLEM STATEMENT

Sustainable wildlife tourism has been justified on the grounds that it has a net positive impact on conservation, in part because it encourages tourists' adoption of pro-conservation behaviors (PCB). Diffusion of Innovations Theory posits that tourists' perceived efficacy of PCB (PEPCB) can impact behavior adoption or rejection. However, few studies have explored tourists' PEPCB or how they are influenced by experiential factors.

Additionally, social media is emerging as a potential PCB, in that it provides a new way for wildlife tourism managers to connect with tourists and strengthen conservation outcomes. However, little is known as to how social media can function as a PCB. Exploring the role of social media as a PCB can improve our understanding of tourists' use of social media and managerial applications related to conservation outcomes.

PURPOSE STATEMENT

The purpose of this study is to explore how wildlife tourists' attitudes, past performance of PCB, and engagement with on-site interpretation influence PEPCB. Specifically, this study will utilize Diffusion of Innovations Theory to frame how these factors influence tourists' PEPCB. Secondarily, this study will collect baseline data on tourists' use of social media to address the role of social media use as a PCB within the context of a wildlife tourism experience.

CHAPTER 2 – MANUSCRIPT

To be submitted to Human Dimensions of Wildlife

ABSTRACT

Wildlife tourism is justified when it produces a net-positive impact to wildlife conservation, in part, by encouraging tourists to participate in pro-conservation behaviors (PCB). Diffusion theory proposes that one's perceived efficacy of a behavior will influence rates of behavior adoption. However, empirical data on the factors that influence wildlife tourists' perceived efficacy of PCB (PEPCB) are lacking. This study evaluated experiential elements' influence on tourists' PEPCB, and the role of social media as an emerging PCB. Data were collected from *in situ* and *ex situ* wildlife tourists (n=475), presenting a systems-level view of wildlife tourism. Engagement with interpretation, attitudes, and past PCB performance did not influence PEPCB. Data did support tourists' use of social media as an emerging PCB. Results indicate that PCB may already be diffused throughout the community; the only exception are PCB related to social media, which may still be considered innovations and warrant further study.

Keywords: pro-conservation behaviors, social media, tourists

INTRODUCTION

Wildlife Tourism and Pro-Conservation Behaviors

Wildlife tourism has been simply defined as all activities in which tourists experience wildlife (Reynolds & Braithwaite, 2001), and it is an immensely popular activity. A recent report noted that wildlife tourism is growing at a rate of 10% per year (*Towards Measuring the Economic Value of Wildlife Watching Tourism in Africa.*2015). The Association of Zoos and Aquariums reported that 200 million people annually visited accredited sites in 2020 (*Zoo and Aquarium Statistics.* 2020). The US Fish and Wildlife Service estimated that over 53 million visits to National Wildlife Refuges occur on an annual basis (Caudill & Carver, 2019).

As such a popular activity, wildlife tourism can occur in a variety of settings, including parks and protected areas, and zoos and aquariums (PPAZA). These wildlife tourism venues can be divided into two main categories: *in situ* (occurring in the animal's natural habitat, such

as wildlife refuges) and *ex situ* (occurring in captive settings, such as zoos and aquariums) (Higginbottom, 2004). Viewing wildlife tourism through the lens of *ex situ* and *in situ* experiences is important because, as Ballantyne et al. (2007) note, these different experiences impact tourists' knowledge, attitudes, and behaviors in different ways. Together, *in situ* and *ex situ* wildlife tourism venues create a system that can benefit wildlife, as this system is able to produce greater caring toward wildlife and higher PCB intentions among wildlife tourists (Skibins et al., 2013). However, these two venue types are not always viewed together; Bueddefeld (2020) noted a distinct lack of studies comparing *in situ* and *ex situ* venues. Therefore, this study views wildlife tourism at a systems-level while also comparing between *in situ* and *ex situ* venues.

At a systems level, it is important that wildlife tourism supports conservation instead of being detrimental to wildlife. Wildlife tourism has both positive (Apps et al., 2018; Higginbottom et al., 2001; Skibins et al., 2013) and negative (Budowski, 1976; Green & Giese, 2004; Herrero et al., 2005) impacts on wildlife. But wildlife tourism is justified overall if the positive impacts outweigh the negative impacts, thus creating a net positive impact on conservation (Higginbottom et al., 2003). Specifically, wildlife tourism has been shown to encourage pro-conservation behavior (PCB) participation in wildlife tourists (Apps et al., 2018; Ballantyne et al., 2009; Skibins et al., 2013). A variety of pro-conservation behaviors (PCB) are discussed in the literature; Table 1 shows some of these behaviors.

Although there are a wide variety of PCB described in the literature, wildlife tourists may have different perceptions of individual behaviors. Apps et al. (2018) found that, after a wildlife tourism experience, tourists did not increase their participation in financial donation, although all other behaviors increased. Similarly, Smith et al. (2010) found that wildlife tourists were split on

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how they felt about being asked for donations; while some indicated an interest in donations, others noted that they did not want to be asked for donations. These studies begin to explore the differences in wildlife tourists' perceptions of pro-conservation behaviors. Because individual PCB may be perceived differently between individuals, understanding how perceived efficacy of PCB (PEPCB) is formed is important; however, few studies have addressed the formation of this construct.

A variety of factors may influence the formation of tourists' PEPCB, including personality and experiential characteristics. Past studies have shown that a variety of factors – specifically engagement with interpretation during the onsite experience, tourists' attitudes as measured by Clayton's (2003) Environmental Identity (EID) score, and tourists' past performance of PCB – positively correlate with higher PCB intentions. EID has been linked to higher PCB intentions and participation (Clark et al., 2019; Clayton, 2003). Engagement with interpretation has been linked with higher pro-conservation attitudes and PCB (Marschall et al., 2017; Zeppel & Muloin, 2008). Because direct experiences with wildlife can influence psychological constructs such as caring towards wildlife (Skibins et al., 2013), increased PCB performance and concern for wildlife (Apps et al., 2018), and motivating tourists to make changes in long-term behaviors (Ardoin et al., 2015), it can be argued that wildlife tourism positively impacts tourists' participation in, perceptions of, and attitudes towards PCB. However, other studies have shown that wildlife tourism experiences raise PCB intentions, but that does not raise PCB participation (Ballantyne et al., 2011; Hughes, 2013).

Table 1

PCB Discussed in Past Studies

PCB Discussed	Study
Discuss conservation issues with others	(Apps et al., 2018; Ballantyne et al., 2011; Hughes, 2013; Jacobs & Harms, 2014; Kelly & Skibins, 2021)
Seek out conservation information	(Apps et al., 2018; Ballantyne et al., 2011; Hughes, 2013; Kelly & Skibins, 2021; Powell & Ham, 2008)
Volunteering for a conservation issue	(Ballantyne et al., 2011; Hughes, 2013; Jacobs & Harms, 2014; Kelly & Skibins, 2021; Rattan et al., 2012; Skibins et al., 2013)
Change purchasing decisions to support conservation	(Apps et al., 2018; Ballantyne et al., 2011; Hughes, 2013; Kelly & Skibins, 2021; Powell & Ham, 2008; Skibins & Powell, 2013; Smith et al., 2010)
Donate financially to conservation issues	(Hughes, 2013; Jacob & Harms, 2013; Kelly & Skibins, 2021; Powell & Ham, 2008; Skibins & Powell, 2013)
Sign up to receive additional information about conservation	(Apps et al., 2018; Skibins & Powell, 2013)
Support conservation policies/voting for conservation issues	(Apps et al., 2018; Kelly & Skibins, 2021; Powell & Ham, 2008; Skibins & Powell, 2013)
Join a conservation organization	(Powell & Ham, 2008; Skibins & Powell, 2013)

Social Media and Wildlife Tourism

Online resources, including social media, are a growing information sources that have helped today's PPAZA tourists to be "better informed than ever before" (Fatanti & Suyadnya, 2015, p. 1093). Social media is used by wildlife tourists in a variety of ways, including as an information source before and during their visit, a way to stay connected to wildlife tourism venues after the conclusion of the visit, and a mechanism for sharing with others about their experiences. Thus, within the context of wildlife tourism, social media is a growing innovation, allowing tourists to take on new behaviors; because of this, it has the potential to function as a PCB.

Social media and other online resources may help tourists stay connected to the site, even after they return home (Kim et al., 2015). Scott and Harmon (2016) say that online platforms allow for extended leisure experiences, which provide a context for thinking discussing, and reminiscing about events experienced during the tourism experience, which is consistent with information-based PCB such as "seeking out more conservation information" (Ballantyne et al., 2011).

Furthermore, it has been recommended that wildlife tourism experiences consider using web-based technologies and social networking to maintain contact with visitors after they leave (Ballantyne et al., 2011). Ardoin et al. (2015) describe technology as a means of lengthening the wildlife tourism experience, noting that "technology is now important for delivering interpretive opportunities that emphasize social interactions, facilitating community-building among visitors and guides and nurturing place loyalty – whether during or after the tour, face-to face, or virtually" (p. 854). These studies highlight the important role that platforms like websites and social media can play in the wildlife tourist experience and in engaging the public in PCB.

Posting on social media also helps tourists share about their experiences and function as a longitudinal PCB (Wilkins et al., 2018). Posting online may be done while tourists are at the site or after they leave (Munar & Jacobsen, 2014). Posting online may be altering the way that tourists share about their experiences with others after their visit; instead of sending a postcard or showing trip photos in person, tourists can post immediately about their visits to a wide variety of online users (Boley et al., 2018; Munar & Jacobsen, 2014).When tourists post to social media while still onsite, they may receive immediate feedback from others that can impact later parts of the visit (Scott & Harmon, 2016). Posting on social media allows tourists to move from a passive to an active role (Choe et al., 2017; Marine-Roig et al., 2017).

Although some work has been done to identify ways in which social media impacts tourist behaviors, some authors have called for more research on the impact of social media on these behaviors. Discussing the literature on online content and tourism, Zeng and Gerritsen (2014) note that little is known about how social media impacts tourist behaviors during the visit. Choe et al. (2017) suggest that future research should investigate how social media alters tourists' behaviors. Better understanding of wildlife tourists' use of social media and websites as a component of their experiences could provide baseline information to assist in future studies of the role these online resources play in tourists' behaviors both onsite and after the visit.

Theoretical Framework

This study is based on Rogers' (2003) Diffusion of Innovations Theory (Figure 1), which models how an innovation is communicated through certain channels over time among members of a social system, ultimately leading to behavior adoption. In this study, PCB are considered to be the confirmation state, and PEPCB are considered the antecedent predictor (Figure 2),

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consistent with previous studies (Lu et al., 2015; Smerecnik & Andersen, 2011; Taylor & Lamm, 2017). Other studies of sustainability, conservation, and tourism have utilized Diffusion of Innovations Theory in similar ways (Dabphet et al., 2012; Smerecnik & Andersen, 2011). This study therefore hypothesizes that PCB are not diffused throughout the population; instead, PCB are innovations for which wildlife tourists may not have been exposed.

This modified model for this study (Figure 2) contains three main stages that align to a wildlife tourism experience: knowledge, persuasion, and decision (Rogers, 2003). The knowledge phase refers to "when an individual…learns of the innovation's existence and gains some understanding of how it functions" (Rogers, 1995, p. 20). In this study, knowledge is a combination of personality characteristics, measured by attitudes (Environmental Identity, as discussed in Clayton, 2003), and communication integration, measured by engagement with interpretation.

The next step in the model is persuasion. Rogers (1995) refers to persuasion as "when an individual…forms a favorable or unfavorable attitude toward the innovation" (p. 20). In this study, persuasion is measured by trialability, or a person's ability to test out an innovation (Rogers, 2003) and leads to a higher innovation adoption rate (Sahin, 2006). Here, persuasion is influenced by trialability, which is measured by past performance of PCB.

The final stage of the model is the decision stage where the innovation has, or has not, been put into action. Rogers (1995) says that this is when the individual "engages in activities that lead to a choice to adopt or reject an innovation" (p. 20). In this study, perceived efficacy of PCB (PEPCB) represents the decision stage; when viewing PCB as innovations, the way tourists perceive these behaviors influences the behaviors' rates of adoption (Flight et al., 2011).

Perceived Innovation Characteristics is generally made up of the public's subjective assessment

of the innovation, rather than an objective assessment (Zhu & He, 2002). One component of

Perceived Innovation Characteristics is trialability, or individuals' ability to try out an innovation

(Warner et al., 2019).

However, within the wildlife tourism literature, few studies have addressed PEPCB.

Using a modified Diffusion of Innovations model, this study seeks to fill this gap by

investigating how wildlife tourists' PEPCB varies based on the following experiential elements:

attitudes (via the Environmental Identity scale), past participation in PCB, and engagement with

interpretation.

Figure 1

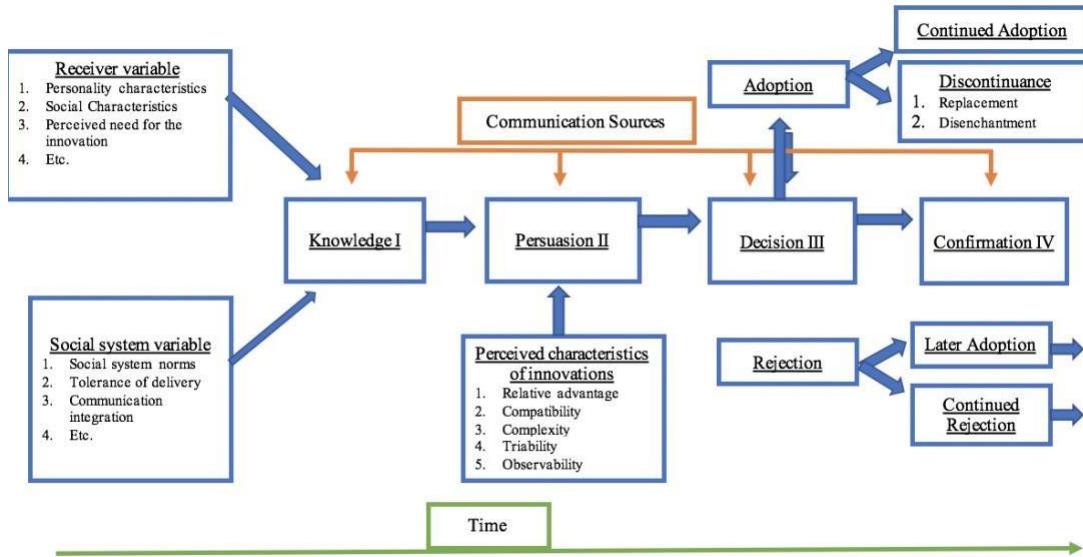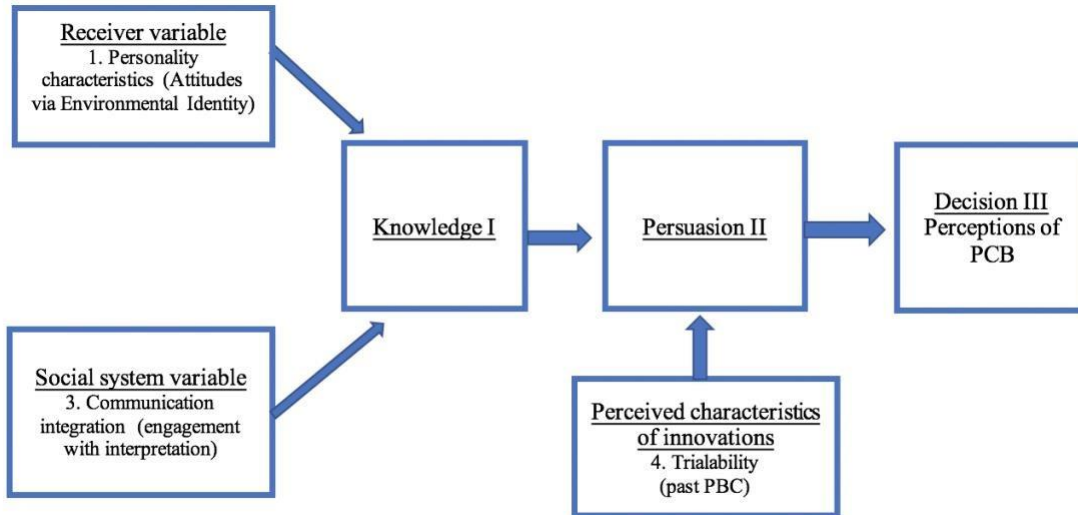*Rogers (2003) Diffusion of Innovations Model*

Figure 2

Modified version of Diffusion of Innovations Model, Based on Rogers (2003)

STUDY OBJECTIVES

This study has two key objectives. Firstly, this study explores how wildlife tourists' attitudes, past performance of PCB, and engagement with on-site interpretation influence PEPCB. A modified Diffusion of Innovations model is used to understand how these factors influence wildlife tourists' PEPCB. Secondly, this study will assess tourists' use of social media to address the role of social media use as a wildlife tourism PCB.

Study Site

Wildlife tourism in North Carolina draws in more than 4 million tourists annually and occurs in a wide variety of *in situ* and *ex situ* venues. For the purposes of this study, seven wildlife tourism venues were selected for data collection. Figure 3 provides a map of the locations of the study sites.

Pea Island National Wildlife Refuge and Alligator River National Wildlife Refuge, operated by the US Fish and Wildlife Service, served as *in situ* data collection sites. Pea Island is 4,655 acres, attracts 2.7 million tourists annually, and is a highly popular birding destination (*Pea Island National Wildlife Refuge.* n.d.). Alligator River is 153,000 acres in size, draws 62,000 tourists annually, and is popular for seeing species such as red wolves, black bears, American alligators, and a variety of birds (*Alligator River National Wildlife Refuge.* n.d.).

To represent *ex situ* wildlife tourism, the North Carolina Aquariums at Roanoke Island, Pine Knoll Shores, and Fort Fisher, as well as Sylvan Heights Bird Park and the North Carolina Zoo, served as study sites. The three North Carolina Aquariums serve nearly 1.2 million tourists annually and have a variety of conservation initiatives integrated into the visit experience (*Annual Report 2018.*2019). Sylvan Heights Bird Park is located in Scotland Neck, NC, hosts 55,000 tourists annually, and is home to over 2,000 birds (*Our History.* n.d.). The North Carolina

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Zoo in Asheboro, NC is accredited by the World Association of Zoos and Aquariums and the Association of Zoos and Aquarium. The Zoo hosts 860,000 tourists per year, is home to more than 1,800 animals and 250 species, and is the largest natural habitat zoo in the world (*North Carolina Zoo.* 2020).

Figure 1

Map of Study Sites
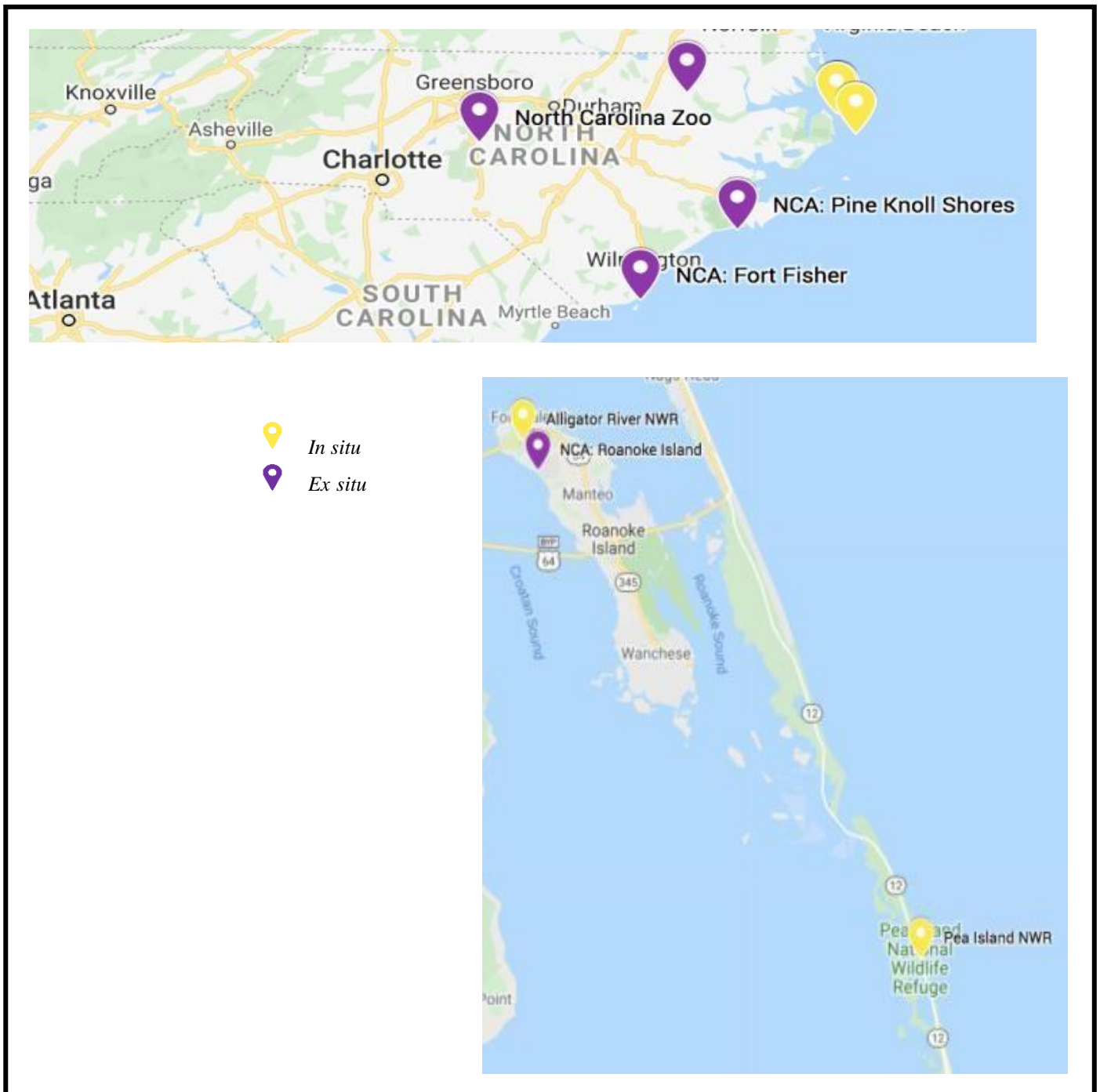
METHODS

Survey Instrument Administration & Analyses

Data for this study were collected via onsite sampling in July and August of 2019. These months were selected for sampling to align with peak summer visitation. Sampling days were distributed evenly between weekends and weekdays. Surveys were collected onsite using a systematic sampling design with a random intercept (Babbie, 2013). All individuals over the age of 18 were eligible to participate as they exited the facility. A total of 540 surveys were collected (68.1% response rate) (*ex situ* N = 360, 66.2% response rate; *in situ* N = 180, 73.5% response rate).

After screening the data for missingness, univariate and multivariate outliers, 65 cases were removed, producing a final sample of 475 valid responses (*ex situ* N = 312; *in situ* N = 163). All analyses were performed using SPSS software (Version 27). t-tests, linear regressions, and one-way ANOVAs were performed.

Variables

Independent Variables

- Engagement with Interpretation (Social Systems Variable: Communication Integration) – Studies have noted the role that interpretation can play in PCB change (Apps et al., 2018, Ballantyne et al., 2011; Powell & Ham, 2008) Respondents reported their participation (yes/no) in four onsite interpretive activities: speak with an interpreter/staff member/ranger, read panels/displays/signs, attend an educational program, and engage with an interpretive exhibit.

- Past Participation in PCB (Perceived Characteristics of Innovations: Trialability) – A variety of PCB related to wildlife tourism have been identified in the literature, including getting involved with wildlife tourism issues and making wildlife-friendly purchases (Powell & Ham, 2018), volunteering for a wildlife cause (Hughes, 2013), and taking political action for conservation (Apps et al., 2018). According to Diffusion of Innovations Theory, the innovation's trialability, or ability to be tested out by respondents, impacts its acceptance rate (Flight et al., 2010). Respondents were asked (yes/no) if they had ever participated in the following PCB: volunteered for a conservation event/issue, used/purchased items because they benefit wildlife, not used/purchased items because they harm wildlife, sought out information to learn more about a wildlife conservation issue, used social media to learn more about a wildlife conservation issue. This list of PCB was formed based on past studies (see Table 1 for list of PCB from past wildlife tourism studies).

- Attitudes (EID Score) (Receiver Variable: Personality Characteristics) – Previous studies have shown a relationship between EID and PCB participation and intentions (Clark et al., 2019; Clayton, 2003; Dresner et al., 2015). Respondents were asked to respond to 15 items from the EID scale. Items were scored on a 7-point Likert scale from 1(not at all true of me0 to 7 (completely true of me).

Dependent Variables

- Perceived Efficacy of PCB (PEPCB) (Decision III) – Empirical studies have noted that wildlife tourists may not perceive all PCB in the same way (Apps et al., 2018; Smith et al., 2010). Respondents were asked to assess the efficacy of eight PCB. The behaviors

were assessed on a 5-point Likert scale, with a neutral midpoint, from 1 (highly ineffective) to 5 (highly effective).

RESULTS

Sample Description

When asked about country of residence, 99% (468) of respondents were residents of the United States (*ex situ* = 99% (309), *in situ* = 98% (159)). Gender and age data were collected, and 42% (194) of the sample was male (mean age: 42.6 years old) (*ex situ* = 42% (129), 38.1 years old; *in situ* = 41% (65), 51.7 years old) and 58% (272) was female (41.7 years old) (*ex situ* = 58% (178), 38.4 years old; *in situ* = 59% (94), 47.8 years old). Education demographics revealed that 30% (134) of respondents were four-year college graduates (*ex situ* = 32% (95); *in situ* = 25% (39)). Another 34% (154) of respondents held graduate or professional degrees (*ex situ* = 28% (82); *in situ* = 46% (72)). Data on respondents' race showed that 89% (410) of the sample was white (*ex situ* = 86% (260), *in situ* = 94% (150)). When asked whether respondents were locals or vacationers, 70% (330) of total respondents were on vacation, and 48% (226) were repeat visitors to the site.

Perceived Efficacy of Pro-Conservation Behaviors (PEPCB)

Tourists were asked to assess the PEPCB on a Likert-type scale ranging from 1 (highly ineffective) to 5 (highly effective) with a neutral midpoint for eight individual behaviors. See Table 2 for complete list. Supporting pro-wildlife legislation had the highest perceived efficacy for the total sample (M ±S.D.) (4.09 ±1.20), *ex situ* sample (4.09 ±1.17), and *in situ* sample (4.09 ±1.25). Being an advocate for conservation on social media had the lowest perceived efficacy for the total sample (3.62 ±1.14), *ex situ* sample (3.61 ±1.13), and *in situ* sample (3.63 ±1.16).

T-tests were performed to assess differences in PEPCB for each behavior between the *in situ* and *ex situ* samples. A significant difference was identified for perceived efficacy of purchasing wildlife friendly-products ($t_{(469)} = 2.26$, $p = .02$) between *in situ* and *ex situ* samples; *ex situ* respondents had a higher mean perception of this behavior's efficacy (3.92 ± 1.08) than *in situ* respondents (3.69 ± 1.05). No significant mean differences were identified between *in situ* and *ex situ* samples for the following behaviors: making financial contributions to conservation organizations ($t_{(471)} = 1.83$, $p = .09$), being a volunteer for conservation organizations ($t_{(472)} = 1.05$, $p = .29$), avoiding products known to harm wildlife ($t_{(466)} = .73$, $p = .47$), changing lifestyle habits ($t_{(468)} = .03$, $p = .98$), learning more about wildlife conservation ($t_{(467)} = .72$, $p = .47$), being an advocate for wildlife on social media ($t_{(464)} = -1.81$, $p = .86$), and supporting pro-wildlife legislation and policies ($t_{(469)} = .06$, $p = .96$).

Reliability was assessed for PEPCB as a composite variable. The total sample had a Cronbach's Alpha of .94 ($M = 3.97 \pm .14$). The *ex situ* sample had a Cronbach's Alpha value of .94 ($M = 3.99 \pm .17$); the *in situ* sample had a Cronbach's Alpha value of .95 ($M = 3.93 \pm .17$). No improvements to Cronbach alpha scores were possible from the removal of any item for total, *in situ*, and *ex situ* samples. Therefore, all items were retained.

The mean and standard deviation composite PEPCB score for the total sample was 3.97 ±.94, 3.99 ±.92 for the *ex situ* sample, and 3.93 ±.97 for *in situ* sample. The mean PEPCB composite score was not significantly different for *in situ* versus *ex situ* venues ($t_{(444)} = .71$, $p = .48$). Whether the respondent was on vacation did not elicit a significant difference in PEPCB score for total sample ($t_{(441)} = -1.25$, $p = .21$), *ex situ* sample ($t_{(289)} = -.91$, $p = .36$), or *in situ* sample ($t_{(150)} = -.69$, $p = .49$). Based on status of first time or repeat visitor, there were no significant differences in PEPCB score for total sample ($t_{(435)} = .55$, $p = .58$), *ex situ* sample ($t_{(285)}$

= .73, p = .46), and *in situ* sample ($t_{(148)}$ = .21 , p = .83). There were also no differences in EID

scores based on first time or repeat visitor for total sample ($t_{(433)}$ = .77 , p = .44), *ex situ* sample

($t_{(282)}$ = -.18 , p = .86), or *in situ* sample ($t_{(149)}$ = .72, p = .48).

Table 2

Mean scores for perceived efficacy of pro-conservation behaviors

	Total Sample	Ex Situ	In Situ
PEPCB Composite Variable	3.97 ± .94	3.99 ±.92	3.93 ±.97
Purchasing wildlife friendly products	3.84 ±1.07	3.92 ±1.08*	3.69 ±1.05*
Making financial contributions to conservation organizations	3.96 ±1.07	4.03 ±1.03	3.84 ±1.14
Being a volunteer for a conservation organization	4.04 ±1.09	4.07 ±1.05	3.96 ±1.15
Avoiding products known to harm wildlife	4.05 ±1.15	4.07 ±1.12	3.99 ±1.20
Changing lifestyle habits	4.00 ±1.16	4.00 ±1.16	3.99 ±1.18
Learning more about wildlife conservation	4.00 ±1.16	4.03 ±1.15	3.94 ±1.19
Being an advocate for wildlife conservation on social media	3.62 ±1.14	3.6 ±1.13	3.63 ±1.16
Supporting pro-wildlife legislation and policies	4.09 ±1.20	4.09 ±1.17	4.09 ±1.25

Note. * $p < .05$; Perceived efficacy of each PCB was assessed on a five-point Likert-type scale, from 1 (highly ineffective) to 5 (highly effective).

Environmental Identity (EID) and PEPCB

Respondents' attitudes were assessed using the Environmental Identity (EID) scale; these items are presented on a 1 (Not at all true of me) -7 (Completely true of me) Likert-type scale. Mean and standard deviation EID scores were as follows: total sample = 6.16 ±0.69; *ex situ* tourists = 6.09 ±0.72; *in situ* tourists = 6.29 ±0.59. EID was not found to be a significant predictor of PEPCB for total sample (R^2 = .006, $F_{(1,418)}$ = 2.48, p = .12), *ex situ* sample (R^2 = .01, $F_{(1,270)}$ = 2.18, p = .14), and *in situ* sample (R^2 = .005, $F_{(1,146)}$ = .81, p = .37). Being on vacation did elicit a significant mean difference in EID score. For total sample, those who were not on vacation had a higher mean EID score (M = 6.31± .61) than those who were on vacation (M = 6.09 ± .71), $t_{(438)}$ = -3.02, p < .01, Cohen's d = -.32. For *ex situ* sample, those who were not on vacation also had a higher EID score (M = 6.24 ± .62) than vacationers (M = 5.99 ± .76), $t_{(255.53)}$ = -3.03, p < .01, Cohen's d = -.35. *In situ* sample respondents followed the same pattern; those not on vacation had a higher EID score (M = 6.58 ± .46) than vacationers (M = 6.23 ± .60), $t_{(150)}$ = -2.71, p = .01, Cohen's d = -.60).

Experiential Elements and PEPCB

For the total sample, respondents participated in a mean of 2.6 ±.93 interpretive activities out of 4. The most common interpretive activity for the total, *ex situ*, and *in situ* sample was reading panels, displays, or signs (total: 98% (465); *ex situ*: 98% (305); *in situ*: 98% (160)), while the least common was attending an educational program (total: 25% (119); *ex situ*: 34% (104); *in situ*: 9% (15)).

A one-way ANOVA was used to assess PEPCB scores based on the number of interpretive activities participated in (0-1, 2, 3, or 4 activities). There was no significant

difference in composite PEPCB scores across number of interpretive activities participated in for

the total sample ($F_{(3,442)} = 1.47$, $p = .22$), *ex situ* sample ($F_{(3,288)} = 2.62$, $p = .05$), and *in situ*

sample ($F_{(3,150)} = 1.01$, $p = .39$).

Figure 2

Total number of interpretive activities participated in based on sample

Sum of Interpretive Activities Participated In
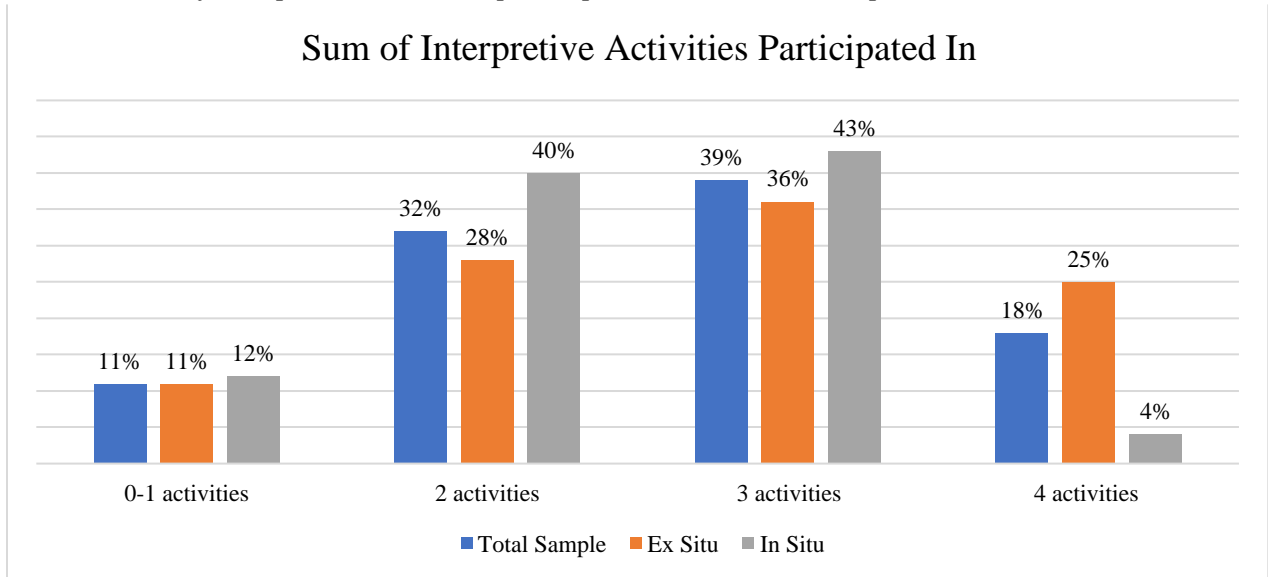
Note. Interpretive activities assessed included: speak with an interpreter/staff member/ranger, read any panels/signs/displays, attend an educational program, and engage with an interactive exhibit

Influence of Past Performance of PCB on PEPCB

Six PCB were assessed for past performance: 1) donated money to a conservation organization, 2) volunteered for a conservation event/issue, 3) used/purchased items because they benefi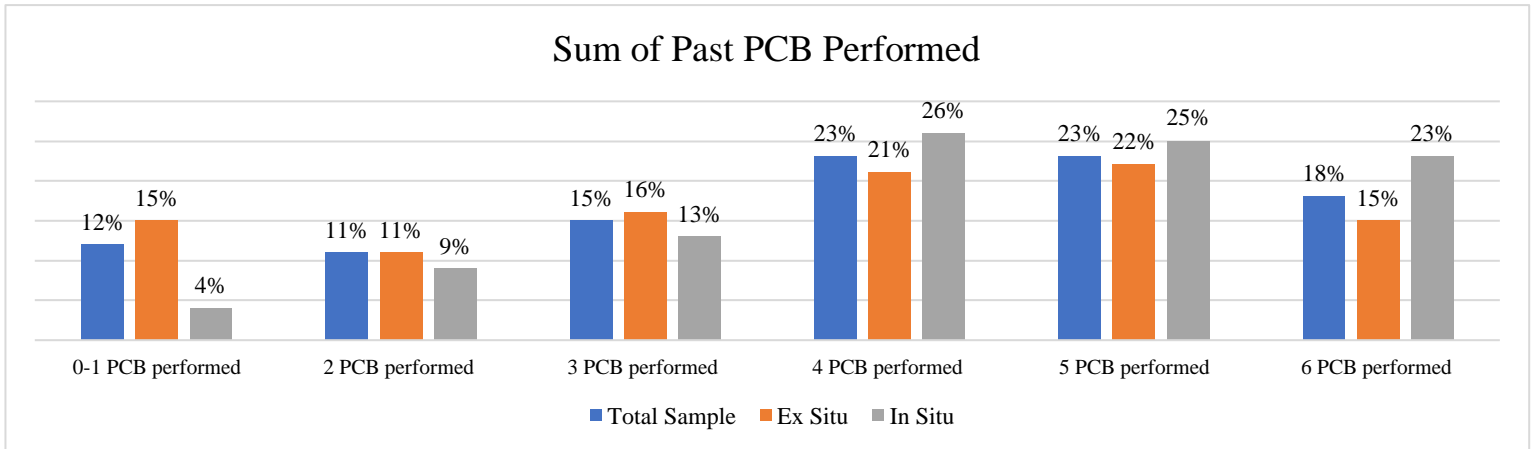t wildlife, 4) not used/purchased items because they harm wildlife, 5) sought out information to learn more about a wildlife conservation issue, and 6) used social media to communicate about wildlife conservation. The total number of PCB performed was calculated for each respondent, ranging from 0 to 6 behaviors: 12% (50) of the total sample performed 0-1 behaviors, 11% (48) participated in 2 behaviors, 15% (67) participated in 3 behaviors, 23% (103) participated in 4 behaviors, 23% (106) participated in 5 behaviors, and 18% (80) participated in all six behaviors (Figure 5). For *ex situ* respondents, 15% (44) or respondents performed 0-1 behaviors, 11% (34) performed 2 behaviors, 16% (47) participated in 3 behaviors, 21% (62) participated in 4 behaviors, 22% (67) performed 5 behaviors, and 15% (44) performed 6 behaviors. For *in situ* respondents, 4% (6) respondents performed 0-1 behaviors, 9% (14) performed 2 behaviors, 13% (20) performed 3 behaviors, 26% (41) performed 4 behaviors, 25% (39) performed 5 behaviors, and 23% (36) performed 6 behaviors. A one-way ANOVA found no significant difference in PEPCB score across number of past PCB performed for total sample ($F_{(5,425)} = .44$, $p = .82$), *ex situ* sample ($F_{(5,275)} = .67$, $p=.64$), and *in situ* sample ($F_{(5,144)} = 1.13$, $p = .35$).

Figure 3

Sum of Past PCB Performed by sample

Sum of Past PCB Performed

Bar chart with categories: 0-1 PCB performed, 2 PCB performed, 3 PCB performed, 4 PCB performed, 5 PCB performed, 6 PCB performed. Series: Total Sample, Ex Situ, In Situ.

- 0-1 PCB performed: 12%, 15%, 4%
- 2 PCB performed: 11%, 11%, 9%
- 3 PCB performed: 15%, 16%, 13%
- 4 PCB performed: 23%, 21%, 26%
- 5 PCB performed: 23%, 22%, 25%
- 6 PCB performed: 18%, 15%, 23%

Legend: ■ Total Sample ■ Ex Situ ■ In Situ

Note. PCB assessed were donated money to a conservation organization, volunteered for a conservation event/issue, used/purchased items because they benefit wildlife, not used/purchased items because they harm wildlife, sought out information to learn more about a wildlife conservation issue, and used social media to communicate about wildlife conservation. Respondents were asked whether they had participated in each PCB (yes/no), and total "yes" responses were counted

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Paired Assessment of Past PCB and PEPCB

As behaviors for PEPCB and past performance of PCB were aligned, t-tests were conducted to assess how PEPCB varied based on past performance of corresponding PCB (Table 3). Two groups were created based on yes/no answers to having performed a specific PCB. There were no significant differences in PEPCB based on past behavior performance for the following: donating money ($t_{(466)}$ = -.08, p = .93), volunteering ($t_{(467)}$ = -1.46, p = .15), using/purchasing wildlife-friendly products ($t_{(100.79)}$ = -1.05, p = .29), not using or purchasing products known to harm wildlife ($t_{(457)}$ = -.39, p = .70), and sought out information to learn more about a wildlife conservation issue ($t_{(461)}$ = -.59, p = .55). See below for results related to social media as a PCB.

Table 3

Mean PEPCB Scores based on Past Participation in Corresponding PCB

Past PCB Performed	Total Sample		*Ex situ*		*In situ*	
	yes	no	yes	no	yes	no
Used social media to communicate about wildlife conservation	3.78 ±1.17*	3.52 ±1.11*	3.84 ±1.13*	3.49 ±1.11*	3.68 ±1.24	3.59 ±1.12
Donated money to a conservation organization (excluding membership fees)?	3.97 ±1.07	3.96 ±1.07	4.01 ±1.07	4.07 ±.95	3.90 ±1.08	3.65 ±1.35
Volunteered for a conservation event/issue?	4.13 ±1.06	3.98 ±1.11	4.14 ±1.08	4.03 ±1.04	4.10 ±1.04	3.86 ±1.24
Used/purchased items because they benefit wildlife	3.86 ±1.05	3.70 ±1.19	3.96 ±1.03	3.69 ±1.24	3.68 ±1.06	3.73 ±1.03

Not used/purchased items because they harm wildlife	4.05 ±1.14	4.00 ±1.18	4.09 ±1.11	4.00 ±1.16	3.98 ±1.20	4.00 ±1.25
Sought out information to learn more about a wildlife conservation issue	4.01 ±1.17	3.93 ±1.16	4.05 ±1.15	3.94 ±1.17	3.93 ±1.20	3.91 ±1.15

Note. * p < .05; Perceived efficacy of each PCB was assessed on a five-point Likert-type scale, from 1 (highly ineffective) to 5 (highly effective).

EID and Past Performance of PCB

A linear regression was performed to assess whether EID was a significant predictor of past performance of PCB, as measured by cumulative past performance of PCB (see Table 4). EID was found to be a significant predictor of cumulative past performance of PCB for the total sample ($R^2 = .12$, $F_{(1,424)} = 59.93$, $p < .01$); the *ex situ* sample ($R^2 = .12$, $F_{(1,275)} = 37.22$, $p < .01$); and the *in situ* sample ($R^2 = .10$, $F_{(1,148)} = 16.45$, $p < .01$). One-way ANOVA tests found a significant difference in EID scores based on sum score of past behaviors (0-1 behaviors, 2 behaviors, 3 behaviors, 4 behaviors, 5 behaviors, or 6 behaviors) for total sample ($F_{(6,418)} = 10.50$, $p < .01$), *ex situ* sample ($F_{(6,269)} = 7.10$, $p < .01$), and *in situ* sample ($F_{(6,142)} = 4.01$, $p < .01$). For complete post hoc analysis results, see Table 4.

Table 4

Post-hoc analyses of EID Scores Based on Past Performance of PCB

# of PCB performed in the past	Total Sample	*Ex situ*	*In situ*
0-1	$5.58 \pm .83^{AC}$	$5.50 \pm .84^{A}$	$6.04 \pm .64^{ABCDEF}$
2	$5.98 \pm .76_{ACDE}$	$5.99 \pm .81_{BCDEF}$	$5.96 \pm .65^{ABCDE}$
3	$6.03 \pm .73_{BCDEF}$	$5.98 \pm .69_{BCDEF}$	$6.14 \pm .80^{ABCDEF}$
4	$6.15 \pm .61_{BCDEF}$	$6.15 \pm .64_{BCDEF}$	$6.16 \pm .56^{ABCDEF}$
5	$6.33 \pm .54_{BDEFG}$	$6.26 \pm .57^{BCDEF}$	$6.44 \pm .45^{ABCDEF}$
6	$6.46 \pm .52^{BFG}$	$6.40 \pm .59_{BCDEF}$	$6.53 \pm .42^{ACDEF}$

Note. Superscripts indicate results that are not significantly different from other rows; total sample, *ex situ,* and *in situ* samples were compared independently of each other.

Social Media as PCB

Of the total sample, 40% (190) visited the site's website or social media pages prior to visiting, 9% (44) visited during their visit, and 46% (214) intended to visit after returning home. Among *ex situ* respondents, 46% (141) visited the site's website or social media prior to vising, 9% (29) visited during their visit, and 42% (127) planned to visit after returning home. Among *in situ* respondents, 30% (49) visited the site's website or social media pages prior to visiting, 9% (15) visited during their visit, and 55% (87) intended to visit after returning home.

Of the total sample, 25% (118) shared information about their visit on social media while onsite, and 53% (252) intended to share about their visit on social media upon returning home. For the *ex situ* sample, 29% or respondents logged on to social media to share during their visit, while 44% planned to post on social media after returning home. For the *in situ* sample, 17% of respondents logged on to social media to post during their visit and 48% planned to post after their visit.

A series of independent sample T-tests were performed to look for significant differences in PEPCB between those who answered yes or no to certain uses of social media. No significant differences in PEPCB were found for the following uses of social media: visiting the site's website/social media pages prior to coming today (total: $t_{(440)} = -1.57$, $p = .12$; *ex situ*: $t_{(288)} = -1.60$, $p = .11$; *in situ*: $t_{(150)} = -.28$, $p = .78$), visiting the site's website/social media pages during the visit today (total: $t_{(437)} = .57$, $p = .57$; *ex situ*: $t_{(286)} = .22$, $p = .83$; *in situ*: $t_{(149)} = .64$, $p = .52$), will visit the site's website/social media pages after returning home (total: $t_{(431)} = .06$, $p = .95$; *ex situ*: $t_{(283)} = -.52$, $p = .60$; *in situ*: $t_{(146)} = .62$, $p = .54$), and having used social media to communicate about wildlife tourism in the past (total: $t_{(297.11)} = -.02$, $p = .98$; *ex situ*: $t_{(286)} = -.82$, $p = .41$; *in situ*: $t_{(150)} = .85$, $p = .40$).

For *in situ* tourists and total sample, there was a significant difference between use of social media after the visit and sum score of behavior participation. Specifically, for the total sample, those respondents who planned to use social media after the visit had participated in a greater number of PCB in the past ($M = 4.14 \pm 1.55$) versus those who did not plan to use social media or websites after the visit ($M = 3.69, \pm 1.54$), $t_{(440)} = 3.04, p < .01$. Additionally, *in situ* tourists who did plan to use social media after the visit had participated in a greater number of PCB in the past ($M = 4.43 \pm 1.35$) versus those who did not plan to use social media or websites after the visit ($M = 3.97 \pm 1.41$), $t_{(440)} = 2.97, p < .01$. For the *ex situ* sample, no significant difference was found ($t_{(289)} = 1.89, p = .06$).

The only PCB whose perceived efficacy varied based on past participation was posting on social media; for total sample, those who had posted on social media about wildlife issues in the past reported a significantly higher perceived efficacy of that behavior ($M = 3.78 \pm 1.17$) versus those who had not participated in this behavior ($M = 3.52 \pm 1.11$), $t_{(458)} = 2.36, p = .02$, Cohen's $d = .23$). For the *ex situ* sample, those who posted on social media about wildlife issues in the past also had a significantly higher perceived efficacy of that behavior ($M = 3.84 \pm 1.13$) versus those who had not participated in this behavior ($M = 3.49 \pm 1.11$), $t_{(300)} = .59, p = .01$, Cohen's $d = .32$). For the *in situ* sample, there was no significant difference $t_{(156)} = .52, p = .60$. See Table 5 for full results.

Table 5

Descriptive Statistics for Social Media Usage across Visit Stages

	Total Sample		*Ex situ*		*In situ*	
	Yes	No	Yes	No	Yes	No
Did you visit the site's website/social media prior to coming today?	40% (190)	60% (281)	46% (141)	54% (169)	30% (49)	70% (112)
Did you visit the site's website/social media during your visit today?	9% (44)	91% (424)	9% (29)	91% (279)	9% (15)	91% (145)
Did you visit the site's website/social media when your return home?	46% (214)	54% (248)	42% (127)	58% (178)	55% (87)	45% (70)
Did you log on to any social media websites during your visit today in order to share information about your visit?	25% (118)	75% (356)	29% (90)	71% (222)	17% (28)	83% (134)
Are you likely to post to social media about your visit today when you return home?	53% (252)	47% (220)	44% (135)	56% (174)	48% (78)	53% (85)

DISCUSSION

This study investigated the influence of various factors on wildlife tourists' PEPCB through a modified version of the Diffusion of Innovations model. Additionally, this study explored the role that social media plays as an emerging PCB. By assessing *in situ* and *ex situ* wildlife tourists, the findings of this study showed that although wildlife tourists' PEPCB was high, factors assessed did not influence it. Support was generated for the role of social media as a unique PCB. Furthermore, unlike the other PCB assessed in this study, the perceived efficacy of social media, as a PCB, was significantly influenced by tourists having performed the behavior in the past.

Overall, respondents perceived the PCB in this study to be effective, with a mean and standard deviation of PEPCB composite score of $3.97 \pm .94$ on a 5-point scale (1 = highly ineffective; 5 = highly effective). Scores greater than 3.0 (neither effective nor ineffective) were considered effective, while scores less than 3.0 were considered ineffective. No PCB were perceived to be ineffective. This is encouraging, as it shows that wildlife tourists hold generally positive perceptions of PCB efficacy, and extends previous work (Dabphet et al., 2012; Smerecnik & Andersen, 2011; Taylor & Lamm, 2017) that has used Diffusion Theory in a conservation and tourism context . However, as Ballantyne et al. (2011) and Hughes (2013) have shown, positive perceptions and behavioral intentions do not necessarily translate to behavior performance.

In order to address the gap in behavior performance, a modified Diffusion of Innovations Model (Figure 3) was used as a framework to model PCB, as it was hypothesized that wildlife tourists may consider PCB to be new and innovative behaviors. This model hypothesized that three variables would influence PEPCB through a modified version of the Diffusion of

Innovations model (Rogers, 2003): engagement with interpretation during the onsite experience, tourists' attitudes as measured by EID, and tourists' past performance of PCB.

However, EID, past participation in PCB, and engagement with interpretation activities were not found to have a meaningful influence on PEPCB in this study. This lack of relationships, coupled with respondents' high level of past participation in these behaviors and high PEPCB, may indicate that PCB are no longer innovations. Instead, these behaviors are saturated throughout the wildlife tourism community, and people believe that they are effective behaviors. Advocating for wildlife on social media was the only PCB that may not be fully diffused, which is supported by the significant difference in perceived efficacy of the behavior based on whether or not a respondent had done this behavior in the past.

Managers, therefore, may need to adjust how they promote PCB throughout the wildlife tourism experience. Many respondents indicated that they have performed PCB in the past and perceive the behavior to be effective. This confirmation by trialability is supported by the Diffusion Theory model. Furthermore, as tourists have already performed several PCB, and maintain high levels of perceived efficacy, it is likely they will continue to perform desired PCB. However, this relationship was not addressed in this study.

To motivate continued PCB participation, managers could encourage new or innovative PCB. Wildlife tourists may be excited to try something new and may participate in these new PCB. At a systems-level, this may require sites to work together to encourage explicit linkages between joint *in situ* and *ex situ* conservation programs. Additionally, managers could consider reframing the scope and scale of desired PCB.

If, as this study has shown, wildlife tourists are performing PCB and hold them in high regard, this brings into question why impacts are not greater. This study indicates that social

media-related behaviors may be a good new PCB to encourage. Future studies can explore these new PCB and can continue to elucidate what factors influence the formation of PCB.

Social Media as PCB

Although social media is highly popular and a growing means of communicating in our society, not all respondents in this study reported using social media in relation to their visit. The majority of respondents used social media to plan for trips in general, but less than half used social media prior to, during, or after their visit to this site. While 40% of the total sample visited website/social media pages prior to the visit and 46% of the total sample planned to visit these pages upon returning home, only 9% of the total sample visited these pages while onsite.

Therefore, PPAZA site managers should not assume that all tourists have accessed their social media or webpages as a component of their visit. Managers should instead focus on pushing tourists to visit the site's website after the visit. In addition, managers should encourage tourists to engage with social media pages through tools like following and friending the site or using a site-specific hashtag. This could facilitate the beginning of an extended leisure experience, which allows tourists to stay connected to their onsite experience after returning home (Scott & Harmon, 2016).

The least common phase of the visit wherein tourists accessed these resources was during the onsite portion of the experience. This is most likely due to poor WiFi reception and/or a lack of signal. While this study did not directly document tourists' ability to get online throughout their onsite experiences, WiFi and cellular service are known to be limited at some of these sites. This poses a new challenge for managers, in that, if social media use can be used as a PCB, then onsite access should become a priority.

As other studies of PCB have noted, onsite PCB intentions may not translate to offsite

PCB participation (Ballantyne et al., 2011; Hughes, 2013). Therefore, if social media is a viable

PCB, and if tourists have access to online resources while onsite, then they also have the ability

to participate in PCB such as advocating for conservation on social media, following or liking a

site's social media pages, or using a conservation-related hashtag while onsite. This could reduce

the loss of intentions upon returning home, extending the work of Ballantyne et al. (2011) and

Hughes (2013). Offering immediate opportunities to participating in PCB onsite have been

suggested in previous studies (Powell & Ham, 2008; Skibins et al., 2013); this study suggests

expanding this practice to social media behaviors. However, site managers must balance the

benefits of increased access with the logistical concerns of WiFi or cell signal infrastructure,

especially in remote areas.

On the basis of these results, site managers should create online content that can be

accessed prior to or after the visit. Alternatively, site managers could search for ways to engage

tourists onsite with online resources. By encouraging tourists to participate in an online PCB

such as following the site on social media (Miller & Freimund, 2017) or signing up for a listserv

(Apps et al., 2018) while still onsite, managers could begin the process of extended leisure

experiences as described by Scott and Harmon (2016) before the visit ends. This expands

previous work (Powell & Ham, 2008) which suggests providing immediate opportunities to

participate in other PCB while still onsite. Within the Diffusion of Innovations model, this would

allow tourists to engage with the element of trialability; in this study, trialability was assessed by

past participation in PCB, thereby showing whether or not respondents had past experience with

these behaviors. Tourists could practice accessing content via the site's webpage or social media

prior to participating in this behavior upon their return home. However, the limited access to

Wifi and cell coverage in some *in situ* locations may have influenced respondents' ability to visit websites/social media during the visit; wildlife tourism venues with reliable onsite access to Wifi or cell coverage may have different usage patterns.

Concerning posting about the visit on social media, respondents were likely to intend to post after their visit than while onsite. This supports past studies (Ardoin et al., 2015; Scott & Harmon, 2016), which have noted that online content has the ability to prolong the visit indefinitely, even after the tourist is no longer onsite; this extends the amount of exposure tourists have to pro-conservation messaging. Similarly, this study found that nearly half of respondents intended to post to social media about their visit after returning home, showing continued engagement with the site even after departing.

As social media has become a means of sharing about onsite experiences with family and friends (Boley et al., 2018; Munar & Jacobsen, 2014), these posts on social media can spread the site's conservation messaging further to those who have never been onsite: if a tourist posts on social media with content about the site's conservation messaging, this messaging is then amplified out to that tourist's social network. Managers should be encouraged by tourists' desire to post on social media after the visit, and they should encourage tourists to utilize social media features such as tagging the site, responsibly geotagging the post's location, or using hashtags to draw friends or family to further conservation messaging. These social media behaviors can serve as a souvenir of the visit (Boley et al., 2013), thereby extending the impact of the visit, as tourists can then reflect on their visit and stay engaged with the site after returning home.

In addition, respondents' high participation in interpretive activities in this study ($M = 2.6$ ±.93 out of 4 behaviors) indicate that wildlife tourists are interested in engaging with sites' interpretive content; therefore, managers should use social media sites to provide further

interpretive content. This would allow offsite tourists to engage with interpretive messaging indefinitely, regardless of whether they had the chance to visit the site in-person. This supports the work of Miller and Freimund (2017), who found that social media could help fulfill a protected area's interpretation goals.

Interestingly, posting on social media was the only PCB whose perceived efficacy was influenced by past participation. This distinguished posting on social media from other PCB in this study. However, the behavior did have the lowest PEPCB scores, albeit still positive. This may be due in part to the "newness" of this behavior; as a still-emerging PCB, the perceived efficacy of social media activities may evolve as social media continues to grow. This PCB is not yet well-established as having an impact on conservation efforts, and therefore wildlife tourists may not yet identify it as an effective PCB. The most popular social media platforms have been in existence for about two decades, and the earliest empirical literature surrounding social media and tourism emerged in 2007 (Zeng & Gerritsen, 2014). As use of social media and understanding of social media continue to grow, the relationship between tourist behavior and social media needs to be investigated further (Scott & Harmon, 2016). Although this was the lowest of behaviors assessed, tourists still perceived this behavior to be over 3 (the neutral midpoint), indicating that tourists do see advocating for social media as a generally effective behavior.

It is also important to note that the role of social media in tourism is often seen as negative. Pearce and Moscardo (2015) note that "A preliminary reading of media coverage of tourist selfies indicates that the practice has been associated with a range of negative outcomes for tourists and destinations places" (p. 60), showing the negative light that is often cast on social media. These negative views of social media come from a variety of sources. Tourists have been

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found to mimic behaviors seen on social media, which can lead to further participation in improper behaviors of protected area tourists (Huang & Sun, 2019). Social media posts may also cause tourists to flock to inaccessible areas, thereby creating over-tourism and resource degradation (Liu et al., 2019). These negative impacts of social media have been covered in main-stream news stories (Holson, 2018; Leasca, 2019; Mele, 2016), which are highly visible to tourists. This could influence tourists' perceptions of these behaviors, creating a negative perception. Managers therefore may need to highlight ways to positively and responsibly utilize social media.

If managers are to encourage tourists to participate in social media-related PCB such as tagging the site or using certain hashtags, these findings indicate that getting tourists to engage in these PCB for the first time may be the most difficult. As noted above, those who have not participated in social media advocacy had a significantly lower perception of this behavior's efficacy. Because trialability has been shown to increase acceptance rate of innovations in the Diffusion of Innovations model (Flight et al., 2011) and this study shows that trialability of social media behaviors was related to a higher perceived efficacy of this behavior, managers could create a "trialability" experience onsite, encouraging tourists to test out these social media-related PCB while still onsite. For those tourists who have previously engaged with social media advocacy, it may take less encouragement to participate in these PCB again.

A few factors limit the generalizability of these findings. Social desirability bias may have influenced results. In addition, there is a lack of long-term follow-up to this study, meaning there is no way to know whether these perceptions change over time or if perceptions influence future adoption or rejection of these PCB. As noted above, the lack to cell service or WiFi at

some of this study's sites may have influenced the data collected concerning social media use while onsite.

CONCLUSION

This study sought to understand experiential factors that influence wildlife tourists' perceived efficacy of pro-conservation behaviors (PEPCB). Using a modified version of Rogers' (2003) Diffusion of Innovations model, this study specifically looked at attitudes, engagement with interpretation, and past performance of PCB. None of these factors were found to significantly influence tourists' PEPCB. However, all PCB were perceived to be fairly effective. This study indicates that PCB are already diffused amongst wildlife tourists and are no longer considered innovations; this may explain tourists' lack of continued participation in these behaviors. Instead, site managers should look for ways to introduce new PCB or expand upon existing PCB to create new, innovative experiences for tourists.

Secondly this study investigated the way in which social media serves as an emerging PCB in the context of the wildlife tourism experience. Social media is used by many wildlife tourists. Posting on social media about wildlife tourism in the past is related to higher perceived efficacy of posting, and those who indicated that they planned to post on social media after their visit had participated in a higher number of PCB in the past. This shows the role that social media plays as an emerging PCB in the wildlife tourism context.

Future studies should investigate other experiential factors that may influence PEPCB, as this study did not link any specific factors to PEPCB. Future studies should also continue to investigate social media as an emerging PCB. They should continue to explore how social media use in the PPAZA context influences tourist behaviors and conservation attitudes.

CHAPTER 3 – CONCLUSION

This chapter provides a reflection of the cumulative thesis process and my final thoughts on the study's outcome. Although this thesis was not the study that I had originally planned, I am thankful for the experiences that it has provided and the knowledge that I have gained from this endeavor. I am incredibly thankful for Dr. Skibins' willingness to fund this study and for allowing me to use this study for my thesis. This study uniquely combined my interests in protected area management, visitor behavior, and social media. I began this process with a desire to learn more about the role of social media in the visitor experience. Because of social media's newness in the literature, I was excited about the opportunity to contribute to this growing body of knowledge through my thesis.

Overall, I was satisfied with the outcomes of this study. This study did begin to answer the two questions asked here, although the findings were very different than hypothesized. Firstly, the relationships shown in the modified Diffusion of Innovations model were found to be insignificant. Attitudes (EID score), past participation in PCB, and engagement with interpretation were all found to not be significant influences on PEPCB. This was an interesting finding in that it indicated factors that were not influential, but it left many questions unanswered. However, it is still unknown what factors do influence the formation of PEPCB. Although I do wish that there had been at least one significant relationship within the model, I have come to appreciate even the not significant results, as they still do provide new information. Secondly, the study provided some interesting baseline data on social media use amongst wildlife tourists. I found these outcomes to be most interesting, as they provide evidence that posting on social media can act as a PCB. This is an emerging concept, and being on the front edge of this research has been exciting for me. Optimally, I would have like to have dug more

deeply into social media data, incorporating more social media questions into the survey. However, I was satisfied with the social media data obtained, and I look forward to seeing how social media research in our discipline develops.

Despite the unique hurdles that I faced in the thesis process, I am overall incredibly thankful for the opportunity to complete my Master of Science at East Carolina University. This experience allowed me the opportunity to learn social science research processes that will be beneficial if I choose to pursue a PhD in the future, and I also refined professional skills that I can utilize as a practitioner in the field. I am especially grateful for the data collection experience that I received through the process of this study; This has truly been an unforgettable experience. I would like to express my sincerest gratitude for everyone in the Recreation Sciences department and the ECU graduate school who has helped me to complete this graduate school process.

CHAPTER 4 - REFERENCES

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APPENDIX A: SURVEY INSTRUMENT

ECU | Department of Recreation Sciences

East Carolina University is conducting a study of wildlife tourism. Your responses are confidential and anonymous. Thank you very much for participating.

Please tell us about your visit.

Q1. Are you on vacation?   ☐   ☐

Q2. Is this your first time visiting this site?   ☐ Yes   ☐ No

Yes   No

Q3. Do you use social media (for example, Facebook, Instagram) to help plan for your vacations?

☐ Yes   ☐ No

    Q3b. If 'yes', compared to other sources, how much do you rely on social media for your vacation?

    ☐ Very little   ☐ About the same as other sources   ☐ A great deal

Q4. Did you visit the wildlife refuge's website/social media pages prior to coming today?

    ☐ Yes   ☐ No

Q5. Did you visit the wildlife refuge's website/social media pages during your visit today?

    ☐ Yes   ☐ No

Q6. Will you visit the wildlife refuge's website/social media pages when you return home?

    ☐ Yes   ☐ No

Q7. Did you log on to any social media websites during your visit today in order to share information about your visit?

☐ Yes   ☐ No

    Q7b. If 'Yes' which website(s) did you visit?_____

Q8. Are you likely to post to social media about your visit today when you return home?

☐ Yes   ☐ No

    Q8b. If 'Yes' which site(s)?_____

During your visit today did you:

Q9. Speak with an interpreter/staff member/ranger?	☐ Yes	☐ No
Q10. Read any panels, displays, or signs?	☐ Yes	☐ No
Q11. Attend an educational program?	☐ Yes	☐ No
Q12. Engage with an interactive exhibit?	☐ Yes	☐ No
Q13. Participate in a self-guided tour?	☐ Yes	☐ No
Q14. Hike a self-guided trail/route?	Yes	No

Q15. Based on this visit, which action for wildlife conservation did you feel this site promoted the most? (*select one*)

- ❑ Make a financial donation
- ❑ Volunteer
- ❑ Promote this site on social media
- ❑ Use/purchase wildlife friendly items
- ❑ Don't use/purchase items because they harm wildlife
- ❑ Seek out information to learn more about wildlife conservation

Please tell us your thoughts about conservation activities.

Q16. Are you a member of a conservation organization?

❑ No   ❑ Yes: Q16b. how many organizations are you a member of?_____

Have you ever:

Q17. Donated money to a conservation organization (excluding membership fees)?
  ❑ Yes   ❑ No

Q18. Volunteered for a conservation event/issue?
  ❑ Yes   ❑ No

Q19. Used/purchased items because they benefit wildlife
  ❑ Yes   ❑ No

Q20. Not used/purchased items because they harm wildlife
  ❑ Yes   ❑ No

Q21. Sought out information to learn more about a wildlife conservation issue
  ❑ Yes   ❑ No

Q22. Used social media to communicate about wildlife conservation
  ❑ Yes   ❑ No

Q23. Do you visit zoos and aquariums near your home?
  ❑ Yes   ❑ No

Q24. Do you visit wildlife refuges near your home?
  ❑ Yes   ❑ No

Q25. Do you visit zoos and aquariums when you are on vacation?
  ❑ Yes   ❑ No

Q26. Do you visit wildlife refuges when you are on vacation?
  ❑ Yes   ❑ No

For each question, please select the <u>one</u> answer you think fits best	Education	Entertainment	Conservation
Q27. The main mission of zoos and aquariums is…			
Q28. The main mission of zoos and aquariums should be…			
Q29. The main mission of wildlife refuges is…			
Q30. The main mission of wildlife refuges should be…			

Please indicate how effective you think each action is for wildlife conservation	Highly ineffective		Neither effective nor ineffective		Highly effective
Q31.Making financial contributions to conservation organizations	1	2	3	4	5
Q32. Being a volunteer for a conservation organization	1	2	3	4	5
Q33. Purchasing wildlife friendly products	1	2	3	4	5
Q34. Avoiding products known to harm wildlife	1	2	3	4	5
Q35. Changing lifestyle habits	1	2	3	4	5
Q36. Learning more about wildlife conservation	1	2	3	4	5
Q37. Being an advocate for wildlife conservation on social media	1	2	3	4	5
Q38. Supporting pro-wildlife legislation and policies	1	2	3	4	5

Please indicate the extent to which each of the following statements describes you.	Not at all true of me			Neither true nor untrue		Completely true of me	
Q39. I like to spend time outdoors in natural settings (such as woods, local parks, lake or beach, or a leafy yard or garden).	1	2	3	4	5	6	7
Q40. I think of myself as a part of nature, not separate from it.	1	2	3	4	5	6	7
Q41. If I had enough resources such as time or money, I would spend some of them to protect the natural environment.	1	2	3	4	5	6	7
Q42. When I am upset or stressed, I can feel better by spending some time outdoors surrounded by nature.	1	2	3	4	5	6	7
Q43. I feel that I have a lot in common with wild animals.	1	2	3	4	5	6	7
Q44. Behaving responsibly toward nature -- living a sustainable lifestyle -- is important to who I am.	1	2	3	4	5	6	7
Q45. Learning about the natural world should be part of everyone's upbringing.	1	2	3	4	5	6	7
Q46. If I could choose, I would prefer to live where I can have a view of the natural environment, such as trees or fields.	1	2	3	4	5	6	7
Q47. An important part of my life would be missing if I was not able to get outside and enjoy nature from time to time.	1	2	3	4	5	6	7
Q48. I think elements of the natural world are more beautiful than any work of art.	1	2	3	4	5	6	7
Q49. I feel refreshed when I spend time in nature.	1	2	3	4	5	6	7
Q50. I consider myself a steward of our natural resources.	1	2	3	4	5	6	7

Q51. I feel comfortable out in nature.	1	2	3	4	5	6	7
Q52. I enjoy encountering elements of nature, like trees or grass, even when I am in a city setting.	1	2	3	4	5	6	7
Q53. I am concerned about the situation of the environment in general.	1	2	3	4	5	6	7

Please tell us a bit about yourself.

Q54. Are you a resident of the United States?

❑ Yes ❑No: Q54b. please list your country of residence_____

Q54c. If 'yes', what is your ZIP code?_____

Q55. In what year were you born? _____

Q56. What is your gender?

❑ Male ❑ Female

Q57. What is the highest level of school you have completed? *(select one)*

❑ Some high school ❑ High school graduate ❑ Trade School
❑ Some college ❑ Two-year college graduate ❑ Four-year college graduate
❑ Graduate/professional degree ❑ Do not wish to answer

Q58. What is your race?

❑ Asian ❑ Black/African American ❑ Hispanic/Latino
❑ White ❑ Do not wish to answer

Thank you for your help! If you have questions regarding this survey, please contact:
Jeffrey Skibins ❘ East Carolina University ❘ skibinsj18@ecu.edu

RESEARCHER USE ONLY

Location	Date	Time	Number

APPENDIX B: IRB APPROVAL

EAST CAROLINA UNIVERSITY

University & Medical Center Institutional Review Board

4N-64 Brody Medical Sciences Building· Mail Stop 682

600 Moye Boulevard · Greenville, NC 27834

Office **252-744-2914** · Fax **252-744-2284** ·

rede.ecu.edu/umcirb/

Notification of Exempt Certification

From: Social/Behavioral IRB

To: Jeffrey Skibins CC:

Date: 1/22/2020

Re: UMCIRB 19-001412

           Evaluation of wildlife tourists' pro-conservation behaviors

I am pleased to inform you that your research submission has been certified as exempt on 1/22/2020. This study is eligible for Exempt Certification under category # 2ab.

It is your responsibility to ensure that this research is conducted in the manner reported in your application and/or protocol, as well as being consistent with the ethical principles of the Belmont Report and your profession.

This research study does not require any additional interaction with the UMCIRB unless there are proposed changes to this study. Any change, prior to implementing that change, must be submitted to the UMCIRB for review and approval. The UMCIRB will determine if the change impacts the eligibility of the research for exempt status. If more substantive review is required, you will be notified within five business days.

Document	Description
consent form.doc(0.01)	Consent Forms
conservation behavior survey.docx(0.01)	Surveys and Questionnaires conservation behavior
survey.docx(0.01) Data Collection Sheet	
recruitment method.docx(0.01)	Recruitment Documents/Scripts
Skibins NRE research cluster proposal FINAL.docx(0.01)	Study Protocol or Grant Application

For research studies where a waiver of HIPAA Authorization has been approved, each of the waiver criteria in 45 CFR 164.512(i)(2)(ii) has been met. Additionally, the elements of PHI to be collected as described in items 1 and 2 of the Application for Waiver of Authorization have been determined to be the minimal necessary for the specified research.

The Chairperson (or designee) does not have a potential for conflict of interest on this study.

IRB00000705   East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781   East Carolina U IRB #2 (Behavioral/SS) IORG0000418