

**UNDERSTANDING SPINNER DOLPHIN MARINE TOURISM IN
HAWAI'I: A SOCIAL APPROACH TO ASSESSING UNDERWATER
INTERACTIONS**

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ABSTRACT

The popularity of wild spinner dolphin interactions in the Hawaiian Islands has led to the expansion of businesses that incorporate in-water experiences with the dolphins. The growth of dolphin-related commerce has spread so quickly that regulations have not been able to keep up. Subsequently, dolphin-swim tourism has redefined how local residents interact with their community and the dolphins. This dissertation attempts to cross traditional research boundaries by incorporating approaches from both biological and social disciplines, including phenomenology, narrative inquiry, ethology, and ecological economics. The research identifies social, economic, and cultural conditions that affect the dolphin-swim industry using an integrative, three-part research strategy. Methods included semi-structured interviews, dolphin-swim participant surveys, and video analysis of underwater footage documenting dolphin-human encounters. Data were collected for two popular dolphin-swim areas in Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island, which were used to compare and contrast community attitudes, commercial operations, economic value, and observed human behavior during dolphin-swims. This is the first known attempt to document and analyze in-water human behavior in the presence of wild dolphins. Statistically significant differences between the two dolphin-swim communities were observed in dolphin-swim experiences, community attitudes, and commercial value. These differences are currently not considered by management in dolphin-swim policy recommendations. By providing a comprehensive analysis of dolphin-swim participants and community and commercial changes, this research can help to inform new policy.

DEDICATION

This dissertation is dedicated to Dr. Lou Herman and Ruby Wiener, who although gone, left their mark on this planet. I feel very fortunate to have been able to share my progress with Lou, a pioneer in marine mammology and dolphin behavior. Dr. Herman was larger than life and inspired so many. Although my grandmother Ruby never got to hear about this work, her passion for the natural world and storytelling abilities fueled my zest for the ocean at an early age. I would also like to dedicate this work to my loving and supportive husband who now knows more about dolphin-human interactions than he ever thought he would.

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Chapter 1: Introduction

In 2008, thirteen million people worldwide used the services of marine tour companies to watch or interact with dolphins and/or whales, generating more revenue than aquaculture and fisheries combined (Higham, Bejder, Allen, Corkerton, and Lusseau, 2015; O'Connor et al., 2009). Both captive and wild swim programs are available and offer different types of opportunities. In particular, the growing demand for wild “swimming with dolphins” supports a global industry that, in some cases, has transformed previously unfrequented marine environments into popular destinations. These destinations serve as common-pool resources that can easily become overly exploited through dolphin tourism if not managed appropriately (Pirotta and Lusseau, 2015). Since human interest in dolphins shows no signs of abating, governments, communities, and natural resource managers must seek solutions for preserving animal well-being and managing conflict in communities affected by dolphin tourism.

In the Hawaiian Islands, the clash surrounding dolphin-centric tourism has transpired for over forty years. Tour boats offer both dolphin watching and swimming in the wild; however, the latter is more popular and will be the focus of this research. An entire industry composed of more than 50 companies revolves around the predictable behavior of the Hawaiian spinner dolphin (*Stenella longirostris*) that forage at night and rest during the day in the shallow, sandy bays (Lammers, 2004). This behavior makes the Hawaiian spinner dolphin uniquely and consistently accessible to shore-based operations, which in turn makes the species prime for marine tourism. The industry has a positive

economic impact on the host communities, but some community members and resource managers see the practice as a threat to cultural values and/or the dolphins themselves.

This dissertation presents an original case study of Hawaiian dolphin-swim tourism, including human perceptions, economics, and human-dolphin interactions that constitute this unique coupled human-environment system. While specific to the Hawaiian Islands, the results presented here reveal themes with broad application in the wider marine-mammal tourism industry.

The rise of dolphin-swim tourism

Marine mammals, especially dolphins, populate many imaginary and historic-cultural landscapes, representing a common, worldwide value (Onofri and Nunes, 2015). For example, ancient Greco-Roman literature and fables, such as Aesop's *The Monkey and the Dolphin*, commonly refer to dolphins and depict the animals as both wise and sacred (Montagu and Lilly, 1963; Sacks, 1995). Dolphin legends from cultures across the globe portray these marine mammals as mythic figures, friends to humans, hunted animals, and connectors to the natural world. Most of the historical interest in dolphins remained confined to maritime cultures; however, in the last forty years, the dolphin has emerged as an icon of popular culture with broad global appeal (Wiener, 2015).

Attitudes towards marine mammals began to shift in urban Western society in the late 20th Century as knowledge of personal relationships with dolphins began to surface (Silva, 2013). As opposed to the mythical and reverential quality of historical human

interest in dolphins, these revelations and subsequent reverberations in popular culture inspired human desire for more personal interaction. Media began to portray dolphins as several intelligent personas that reinforce human desire for interaction, including helpers, jesters, happy beings, and boundary-crossers (Wiener, 2015). These personas not only encouraged human engagement, but also spurred beliefs about medicinal powers and telepathy. The cultural emergence of dolphins also coincided with the advent of inexpensive and convenient air travel, prompting a boom in tourism to exotic coastal and island locations (Urry, 1990). The amplified interest in wildlife coupled with ever-increasing numbers of tourists near dolphin habitat created sufficient demand to support a competitive industry focused on providing tourists the opportunity to swim with dolphins in the wild (Lemelin, 2006).

The anthropomorphizing of dolphins in popular culture not only created demand for dolphin-centric tourism, but also shaped the human perceptions and expectations associated with the activity. Dolphins, viewed as ambassadors of the ocean and revered for their intelligence, were assumed by many people to possess independent agency and willingly participate in dolphin-tourism interactions (Taylor and Carter, 2013). Cloke and Perkins (2005) contend that these representations may not be accurate, as humans tend to divorce social associations from actual animal behaviors. Newsome et al. (2005) and Evernden (1992) argue that assigning human characteristics to animals results in the application of human values to treatment of wildlife.

According to Evernden (1992) there are three types of nature that influence human attitudes and how we behave towards non-human animals. These include “nature as object,” “nature as self,” and “nature as miracle” (Evernden, 1992). Nature as object approaches the natural world in an anthropocentric manner, treating non-human animals with no subjectivity, as an object to be explored and in existence to serve human desires (Evernden, 1992). Nature as self is rooted in a deeper individual moral obligation to the natural world with concern for non-human animals as an extension of the self (Evernden, 1992). Nature as miracle treats the natural environment as enigmatic, unpredictable, and wondrous (Evernden, 2008).

These assigned characteristics ultimately create a construction of dolphins as a resource for entertainment, as a peer of equal intelligence, or as a miracle with spiritual and superior qualities to humans (Evernden, 2008). Any one of these perceptions can motivate participation in dolphin-swim tourism, but each will result in a different set of expectations for the encounter. The act of imposing human-centered attitudes on the natural world impacts decision-making towards non-human species (Fawcett, 1989; Wilson, 1993). For example, some assume that dolphins are always happy because of their large permanent “smile,” but this is due to the structure of their jawline and is unrelated to their temperament. This perceived happiness affects human decisions to participate in dolphin-centric activities, as people assume that when dolphins are “smiling” they are enjoying and willingly participating in human interactions.

Depictions of animals in media often blur the real and simulated, which can influence moral boundaries in humans (Fudge, 2002). Anthropomorphic social representations of dolphins in literature, film, television, visual arts, and other cultural forms are created to fit human perceptions of dolphins as sentient beings. The perceived sentience is fundamental to human attitudes of care and concern towards these animals (Fudge, 2002). The wild dolphin-swim experience revolves around these attitudes, while expectations of dolphin performance gathered through popular culture perpetuate global dolphin-swim tourism.

Substantial debate surrounds the morality of captive and wild dolphin-swims (Warkentin, 2007); however, my research concentrates on wild interactions only. A considerable amount of literature surrounding wild dolphin-swims has expressed concern about the activity negatively impacting the dolphins (Bejder et al., 2006; Christiansen, Lusseau, Stensland, and Berggren, 2010; Constantine 2001; Courbis and Timmel 2009; Donaldson, Finn, Bejder, Lusseau, and Calver, 2012). In particular, continued expansion of swim tourism may bring harm to wild dolphins by directly modifying their behavior (Cloke and Perkins, 2005). Opposing values between those who seek out dolphins to participate in swimming activities and those who work on regulating human interactions with dolphins have led to community conflicts near many dolphin-swim sites. As scientists seek to define the ecological impact of tourism on a case-by-case basis, regulation and management continues to be framed by capitalist discourses on a localized level (Higham et al., 2015). These conflicts extend beyond the morality of swimming

with dolphins and include long-term community dynamics that can be exacerbated by discord between government and indigenous populations.

Dolphin-swim tourism in Hawai‘i

Dolphin-swim tourism in Hawai‘i is centered on the Hawaiian spinner dolphin, a small marine mammal known for their aerial spinning and jumping behavior. In the 1970s, some residents began swimming with the dolphins and reported an ecstatic feeling after participating in the swims (Ocean, 1989). This recreational activity slowly evolved into guided tours with specialized groups looking to connect with the dolphins on a spiritual level. As the number of spiritual swimmers grew, the activity expanded to the commercial sector with a few tour boats devoting their business to swimming with dolphins. As their success grew, so did the number of boats and the popularity of this activity.

Although dolphin populations remain fairly static, spinner dolphin pods between the Hawaiian Islands are genetically distinct, which has implications for management that traditionally viewed the population as a whole (Andrews, 2010). Regardless of site and population, all spinner dolphins hunt cooperatively at night and are most playful during early morning hours while winding down from evening activities (Lammers, 2004). During mid-morning, the dolphins enter a resting state during which the pod moves closer together and swims in unison along the sea floor (see Figure 1). The pods wake in the late afternoon before heading back offshore to hunt in the evening (Lammers, 2004). During critical mid-morning resting periods, the spinner dolphins move slowly in tight

formations, which makes it easy for tourist vessels to locate the pods and place swim participants in the dolphins' path.



Figure 1. Hawaiian spinner dolphins in rest formation grouped closely together. Image credit A. Ward.

Several biological studies have examined the effects of boats on various spinner populations in Hawai'i (see Appendix A). These studies document concerns that tourist activities directed at dolphins may have population effects (such as habitat shifts, compressed resting times resulting in reduced reproduction, and shifting energy budgets). Uncertainty in the population estimates, however, makes it difficult to assess the potential effects of tourism activities on the dolphin populations. One study estimates a total Hawaiian spinner dolphin population of around 3,300 individuals (Barlow, 2006), but recent research has demonstrated that this number is a gross overestimate of the current numbers (Tyne, Pollock, Johnston, and Bejder, 2014).

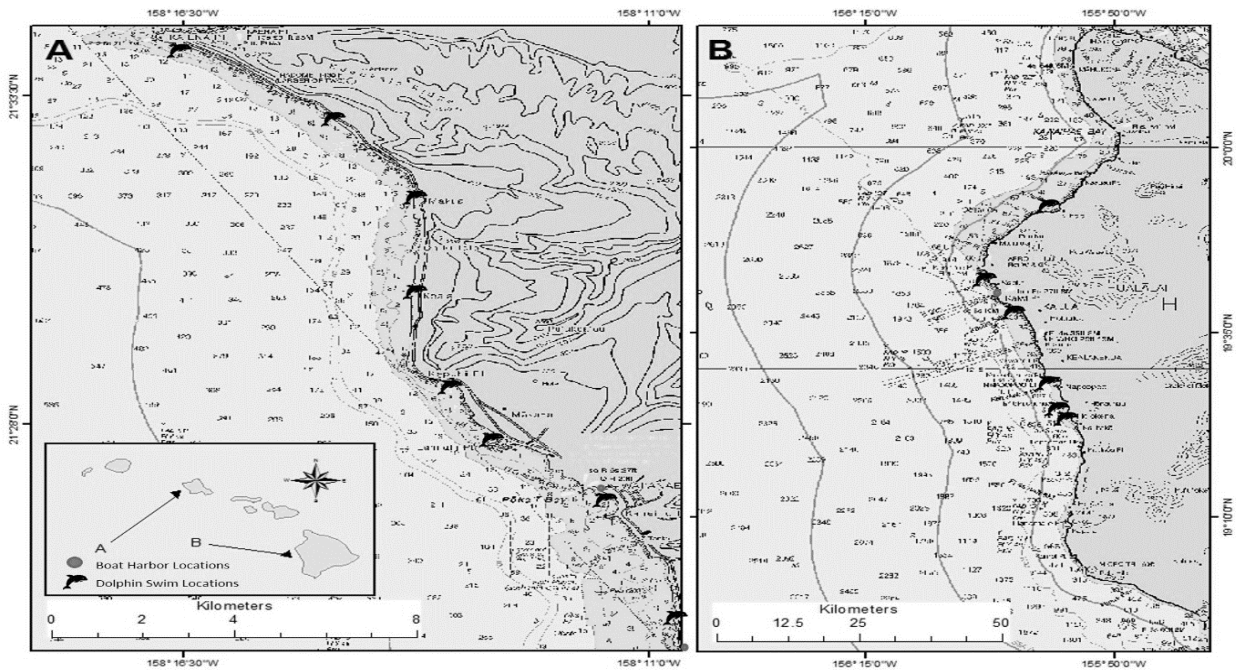


Figure 2. Map of dolphin-swim locations on Kailua-Kona, Hawai'i Island

Hawaiian spinner dolphins can be found in locations throughout the Hawaiian Archipelago, but there are only two locations (as of 2016) where visitors can participate in wild dolphin-swim tours. The first location is along the west coast of O'ahu in the waters surrounding the Wai'anae and Ko'olina boat harbors (Figure 2A). The sites frequently visited by operators pursuing dolphin-swim activities on O'ahu include Yokohama Bay, Mākua Valley, Mākaha, Pōkai Bay, and Kahe Point (Electric Beach). Four bays and the surrounding area along the Kona coast of Hawai'i Island is the second location (Figure 2B). The largest tourist town on the island, Kailua-Kona, is found on the Kona coast and extends for approximately 70 miles (NOAA Fisheries, 2007). Honokōhau harbor, located just outside the town, serves as the largest departing point for dolphin-swim tours targeting Mākako Bay and the nearby waters. It should be noted that bays farther south, including Kealakekua, Hōnaunau, and Ho'okena, are important historical

and cultural sites for Native Hawaiians and are used by unguided shore swimmers to access dolphins, as well as by some tour operators and kayak companies. These areas were also once rich fishing grounds for traditional ʻōpelu (Mackerel scad) and akule (Bigeye scad) fishing (NOAA Fisheries, 2007).

Dolphin-swims and community conflict

As the popularity of dolphin-swims expand, disagreement grows in communities that participate in or are located near the industry. The conflict spans a spectrum of stakeholders (e.g., swimmers, residents, operators, and government) and topics (e.g., fishing ground disputes, ethical/legal debates, and economic interests). Members of the communities living near the bays are increasingly worried about growth in land and ocean traffic, responsible use of the area, and impact on the dolphins. Government workers charged with managing local marine resources echo these concerns. On the other hand, dolphin tourism in Hawai‘i is a profitable business and many people are dependent on the industry. Dolphin-swim tourism is also viewed by some as a positive tool for education, conservation, and economic growth, while others feel that these positive impacts do not outweigh the potentially negative impacts on the dolphin population (Bejder et al., 2006; Courbis and Timmel, 2009; Danil et al., 2005; Delfour, 2007; Östman-Lind, Driscoll-Lind, and Rickards, 2004; Russell, 2001; Wursig, 1996).

Different types of dolphin swimmers contribute to the conflict, because each type of swimmer diverges from others in attitude, reasoning, and frequency of dolphin-swims.

Each group adheres to a distinct set of values and opinions regarding best practices for dolphin-swims. A 2012 study of visitors to Hawai‘i showed that those participating in wildlife tours with high levels of species concern were the same people most likely to harass wildlife (Bernstein, Courbis, Herman, Watson, and Reiser, 2012). The conflict between people, while focused on the dolphins, mostly revolves around competing interests. It is important to note that, like many other human-animal conflicts, underlying and unrelated sources of tension between community groups such as cultural rights, fisheries management, and long-standing land abuses exacerbate the struggle over dolphin tourism in Hawai‘i.

The conflict surrounding spinner dolphins includes four primary issues related to: governance of common resources, tourism contributions to economic sustainability, cultural identity, and social relationships (Silva, 2013). The role of spinner dolphins in the community and the value of dolphins to each person are central to the ethical division amongst involved parties. A division exists between humans based on how they conceptualize their relationships and behavior towards dolphins. Some view the dolphins as superior to humans, affording agency to dolphins to make their own decisions about swimming with humans. Others argue that the dolphin-swims should not occur out of respect for people’s indigenous values and for the safety of the species. Conflict also exists between community members and those specifically profiting from dolphin-swims; the latter arguing that they contribute to the local economy.

History of management

At the time of writing, a pending increase in United States federally-enforced regulation threatens to limit/control access to commercial and recreational interactions with dolphins. The history of such legislation is the political manifestation of the ongoing discord discussed above. Dolphin-swim management must consider all factors related to the industry, including physical and spatial measures, economics, history, legal actions/enforcement, and the social and cultural needs of stakeholders. Each group is passionate about their position, because all individuals involved have a different experience with the dolphins. As Livingston (1994) says, “nature is entirely subjective



and value-laden” and it is for this reason that all parties must feel heard and valued through an iterative process of dialogue and decision-making.

In December 2005, the advance notice of proposed rule changes pertaining to dolphin-swim tourism was released followed by public scoping meetings in October and

Figure 3. NOAA signage posted in south bays on Hawai‘i Island. Image credit C. Wiener.

November of 2006 and a public

comment period. Initiated by the United States National Oceanic and Atmospheric Administration (NOAA) (see Figure 3) in conjunction with the State of Hawai‘i Division of Aquatic Resources, economic data pertaining to dolphin tourism was considered in 2007 along with the initiation of an Environmental Impact Assessment in 2011. In late 2011, NOAA introduced Dolphin SMART¹ in Hawai‘i, which was an attempt to promote responsible behavior by dolphin tour operators. NOAA previously implemented Dolphin SMART in Florida with some success (Powell, Engleby, and Farmer, 2013). Another standards-based certification was introduced in 2010 by the Coral Reef Alliance, a non-profit company working with operators in the Kona region to develop self-regulating guidelines. This latter certification is no longer in use, while the Dolphin SMART program has acknowledged its own shortcomings (Powell, Engleby, and Farmer, 2013). These outcomes are not surprising, as self-regulatory measures implemented in other locations did not end successfully (Higham et al., 2015). NOAA has been developing federally-enforced rules since 2014 and will distribute them for public comment with plans to enact the new regulations by 2017.

Motivation and purpose

The research presented here aims to assess the social implications and effects of dolphin-based tourism on the nearby communities, tourists, and dolphins, providing a baseline of

¹ Dolphin SMART: **S**tay back 50 yards from dolphins; **M**ove away cautiously if dolphins show signs of disturbance; **A**lways put your engine in neutral when dolphins are near; **R**efrain from touching or swimming with wild dolphins; and **T**each others to be Dolphin SMART (<http://sanctuaries.noaa.gov/dolphinSMART/>).

human attitudes and in-water interactions between swimmers and Hawaiian spinner dolphins. By articulating the existing disagreements between humans and the attitudes and behaviors of dolphin-swim participants, this study identifies human-use conflicts in dolphin tourism and develops an integrated analysis of the problems related to dolphin tourism in Hawai‘i. Five over-arching questions motivate this work:

- I. What are the attitudes in dolphin-swim tourism amongst critical commercial and non-commercial groups, including operators, swimmers, and residents; and do these attitudes vary by island in Hawai‘i?
- II. How many tourists and residents are participating in dolphin-swims and what is the direct revenue generated by dolphin-swim tourism?
- III. What behavioral influences and interactions occur during a human-dolphin swim experience?
- IV. What makes a dolphin-swim a successful experience from a human participant’s perspective, and how do these perceptions affect how regulation might impact the industry?
- V. What actions, if any, does the experience of swimming with dolphins initiate for swimmers? Does this experience influence other relationships that swimmers have with the natural world or actions towards marine conservation?

This study also takes proposed management actions into consideration, while looking at the effects of dolphin tourism on the communities, tourists, and dolphin populations. Understanding both the biological and social effects of swim activities on local communities and ecosystems helps to inform governmental policy-making. The results presented here are particularly relevant given the pending implementation of new regulations pertaining to dolphin-swim activities. To answer the questions above and provide a comprehensive understanding of dolphin-swim tourism in Hawai‘i, the research utilizes a theoretical framework rooted in inter-disciplinary traditions.

Theoretical framework

The work presented attempts to cross traditional research boundaries by incorporating approaches from both biological and social disciplines, including phenomenology, narrative inquiry, ethology, and ecological economics. Integrating these varying practices generates a gradient of insights across the spectrum of stakeholders including policymakers, dolphin-swim participants, the public, and the dolphins themselves. Including dolphins as stakeholders is important for creating a holistic and inclusive study that provides an opportunity to ask questions on their behalf. This work follows a self-reflective process recognizing *a priori* knowledge and assumptions, but keeping an open mind to participants' accounts (Starks and Trinidad, 2007).

A phenomenological analysis

Phenomenology and narrative inquiry (oral history) both investigate from the premise that people achieve understanding and find meaning through lived experiences and stories (Starks and Trinidad, 2007; Traher, 2009). Humans interpret and understand their world by formulating their own biographical stories into a form that makes sense to them (Brocki and Wearden, 2006). Experientially-based research pulls from phenomenology's most prominent philosophers, such as Merleau-Ponty and Heidegger, who encourage "being in the world." Grounded in phenomenology, narrative inquiry also supports experiential learning by gathering narratives (both oral and visual) that focus on shared

insights through the complexity with which a story is constructed and the cultural discourses on which it draws (Traher, 2009).

Through close examination of individual experiences, phenomenological analysis in this study attempts to capture meaning and common features of an encounter (Starks and Trinidad, 2007). These experiences are considered subjective and individual meaning is created through participation in both space and time (Starks and Trinidad, 2007). This orientation is evident in the work of Husserl (2002) who uses highly detailed recollection of real-life examples and comparative examination as a form of interpretation. According to Van Manen (2014), Husserl describes phenomenology as a rigorous human science because it investigates the assumptions upon which human understanding is grounded. Phenomenology is therefore an intentional analysis that provides an explication of how meanings are created from the experience (Husserl, 2002; Van Manen, 2014). The phenomenological inquiry presented here concentrates on what it means to experience the underwater world by reflecting on the physical and emotional aspects of wild dolphin swimmers.

Interdisciplinary research

The approach to marine tourism research described above differs from previous work because it incorporates interdisciplinary reading and analyses that are rooted in both a social and biological-based observation practice. My formal training and experience allow for the straddling of disciplinary lines, bringing a relativist perspective to this work.

The multi-disciplinary approach acknowledges the existence of multiple views of equal validity rather than setting varying perspectives in competition.

Barriers to interdisciplinary research often fall between the natural and social sciences, particularly with the complexity of ecological phenomena (Lau and Pasquini, 2008; Lele and Norgaard, 2005). These barriers include differences in values regarding inquiry and research questions, explanatory models and underlying assumptions, and notions of adequate proof (Lau and Pasquini, 2008; Lele and Norgaard, 2005). How researchers determine their ontological and epistemological viewpoint contributes to their pursuit of quantitative or qualitative inquiry (Chase, 2011). The attitude still exists amongst natural science researchers that social science is qualitative and lacking rigor (Lau and Pasquini, 2008; Lele and Norgaard, 2005). Conversely, quantitative research is criticized by social scientists for failing to capture the true nature of human social behavior (Denzin and Lincoln, 1998). As interdisciplinary research becomes more commonplace, academics are beginning to recognize that environmental dilemmas are inextricably linked to both human and biophysical systems (MacMynowski, 2007). This work challenges interdisciplinary barriers by categorizing dolphin-swim tourism in multiple ways, using an ecosystem-based approach that explores community conflict and relationship history, economic valuations, participant attitudes, and human and dolphin behavior.

Interdisciplinary, ecosystem-based work offers a holistic process where both humans and the environment are valued equally because they are interdependent on each other. The underpinning concept is that humans are the major drivers of change in many ecological

systems. While this is true, human actions in this research are considered interactive and reciprocal with the natural world, implying that human behavior can be shaped by perceived changes in the ecosystem state (Phillipson, Lowe, and Bullock, 2009). The ecosystem approach also allows for the translation of ecological data into economic or cultural values (Phillipson et al., 2009). The importance of interdisciplinary collaboration using integrated methods is recognized by both social scientists and ecologists as an effective way to inform policy in the management of socio-ecological systems (Cooke et al., 2009). This allows managers to better grasp complex interactions that affect ecosystem health, factor economic costs into conservation planning, and estimate the effects of conservation policy on human wellbeing (Cooke et al., 2009).

Overview

The inquiry presented here answers a call for research addressing visitor attitudes and behaviors of wildlife experiences and a valuation of the marine tourism industry (Heenehan, 2015; Higham, Bejder, and Lusseau, 2009; Hu, Boehle, Cox, and Pan, 2009). Each chapter uses methods that encourage participant-based formulation of knowledge and addresses the social environment surrounding dolphin-swims. To date, none of the previous spinner dolphin research has been paired with social science inquiry (see Appendix A). Focusing both on the physical distance and sensual influence of the experience, the data collected extract how this experience shapes the attitudes and behaviors of dolphin-swim participants. While there is an existing body of research exploring social aspects of marine tourism (e.g., Cater and Cater, 2007; Garrod and

Wilson, 2003; Buckley, 1994), it provides only a theoretical context and does not integrate with ecosystem-based or biology/ethology-focused work. The research shared in the following chapters addresses current knowledge gaps pertaining to dolphin-swim tourism by integrating important social and biological components. Perhaps most importantly, the results serve as a much needed baseline prior to the implementation of new regulations currently being proposed by natural resource management.

The research was divided into four distinct stages providing space to implement the theoretical framework discussed above.

Chapter 2, *Friendly or dangerous waters? Understanding dolphin-swim tourism encounters*, and Chapter 3, *Dolphin tourism and human perceptions: Social considerations to assessing the human-dolphin interface*, offer an assessment of the current knowledge within dolphin-swim tourism, looking at previous marine mammal encounter research and extrapolating trends and meanings produced through dolphin-swim experiences. Chapter 2 summarizes a small literature study of academic papers that were published over a period of 16 years spanning from 1995 to 2011. Papers were divided into natural and social science research and then reviewed by theme and content. Chapter 3 provides a broader overview of the literature exploring how marine tourism has perpetuated dolphin-swim activities for leisure, and addresses some of the issues in the context of previous tourism work.

Chapter 4, *Fins over feet: Commercial and community attitudes towards wild Hawaiian spinner dolphin-swim tourism*, delivers a comparative analysis of the commercial and community interviews showing significant differences between the Kailua-Kona, Hawai‘i Island and Wai‘anae, O‘ahu locations. The discussion in this chapter explores themes of community and commercial changes, human-dolphin connections, community conflict, and regulation initiatives, which demonstrates the need for location-specific management of the dolphin-swim industry.

Chapter 5, *Cashing in on spinners: Economic estimates for wild dolphin-swim tourism in the Hawaiian Islands*, combines data collected from commercial participant interviews with market research sourced online to quantify the local financial impact of the dolphin-swim industry. The assembly of economic data provides a platform for estimating the number of dolphin tour participants and direct revenue generated from dolphin-swim and viewing tours. Considerable differences exist between businesses in Kailua-Kona, Hawai‘i Island and Wai‘anae, O‘ahu, and this trend extends into the participant behavior discussed in the following chapter.

Chapter 6, *Diving deep: A first in-water assessment of spinner dolphin-swim tourism in Hawai‘i*, offers a unique in-water perspective of the relational space and interactions between dolphin-swim participants and the Hawaiian spinner dolphins. The analysis emphasizes swimmer behaviors and how their experiences influence their perspectives, as well as dolphin behavior. Results show that swimmers with more experience tend to exhibit aggressive behaviors such as diving with the dolphins, chasing, and deliberate

approaches towards dolphins. These behaviors result in altered behaviors exhibited by the dolphins such as increased breath at the surface and a reduction in slow travel.

The chapters build on each other and act as stand-alone manuscripts for journal submission, expanding knowledge pertaining to different aspects of dolphin-swim tourism in the Hawaiian Islands. While each chapter relates to one another, they should be treated as stand-alone studies and papers that contribute to the building of knowledge surround the two sites of commercial dolphin-swim tourism, Kailua-Kona, Hawai'i Island and Wai'anae, O'ahu.

Chapter 2: Dolphin tourism and human perceptions: Social considerations to assessing the human-dolphin interface

Preface

The previous chapter provides a broad overview of what will be discussed within this dissertation. This chapter, *Dolphin tourism & human perceptions: Social considerations to assessing the human-dolphin interface*, is the first of two literature chapters that sets the stage for the research conducted. This paper was published in 2015 as a stand-alone chapter in *Birds, Beasts and Tourists: Human-Animal Relations in Tourism*. The literature review was placed in the second part of the book, *Conflict, Contradiction, and Contestation*, which focuses on non-human animals and how they inhabit contemporary tourism spaces and experiences. The book looks at a spectrum of roles that nonhuman animals play in these encounters- alive, dead, wild, captive, and symbolic. This chapter emphasizes the varied relationships and tensions between dolphins, humans, and the tourism industry, while discussing the great appeal that dolphins have. A detailed look at the specific literature produced in dolphin tourism work will be explored in the following chapter, *Friendly or Dangerous Waters? Understanding Dolphin-Swim Tourism Encounters*.

Introduction

The allure of dolphins reflects a long standing relationship with humans shaped by cultural, social, and scientific perspectives (Wiener, 2013). In the past twenty years, swim-with-dolphin activities have dramatically grown in popularity, leading to the development of globally distributed hot-beds of dolphin tourism. The stereotypical dolphin ‘personality’ fashioned in pop-culture plays an important role in understanding the drive for dolphin tourism that relies on a fused portrayal of dolphins as exotic, wild, intelligent, and human-like. Dolphins spark an intense desire in people to cross human-animal boundaries, which motivates the pursuit of dolphin interactions.

A long history of the dolphin-human interface ranges from early contact with lone, sociable individuals to more recent commercial swim-with-dolphin tours (Constantine, 2001). Dolphin tourism can vary dramatically depending on the type of activity pursued; there are differences between feeding, swimming, and watching programs either in captivity or in the wild (Bulbeck, 2005). The majority of dolphin-swim programs involve coastal dolphin species; however, there are a few exceptions where swimming with whales also occurs. Dolphin tourism represents single-purpose recreation where emphasis is placed on the viewing and/or interacting with one particular species. Those who partake in dolphin tourism are a subgroup of wildlife tourists who differ in their involvement, familiarity, and goals. Wild dolphin tourism can occur from different platforms: land-based (from the beach), boat-based (off-shore), and air-based

(helicopter/small plane) (Finkler and Higham, 2004). Boat-based viewing offers swimming and snorkeling experiences, with a few rare scuba diving with dolphin options.

Dolphin interactions as part of a broader marine tourism industry can provide psychological, economic, environmental, physiological, social, and educational benefits; however, a more detailed evaluation of the tourist experience is needed to identify approaches that promote attitude and lifestyle changes amongst tourists (Zeppel and Mulion, 2008). Environmental educators such as Louv (2008) argue in favour of interactions with the natural world to promote a re-engagement with, and interest in, environmental conservation. Others, such as Evernden (1992), caution that these experiences do not necessarily erase the conflict between nature and present day consumption-based culture. Perhaps it is the quality of these encounters that alters the eventual outcome; Livingston (1994) suggests that naturalists can be open to a different quality of encounter with the natural world, one where the wonder and excitement generated defines the experience. Any participant can be environmentally sympathetic; however, it is those who are most open to these experiences, regardless of the quality of the encounter, who appear to benefit the most. With human-dolphin encounters on the rise and many people reporting this event as a life-long dream, it seems necessary to further investigate these sites of engagement and how the experiences influence the participants.

This chapter focuses on the act of swimming with dolphins and why it drives human interest in dolphins. Previous literature has paid little attention to the actual in-water

experience of the participant, deemphasizing the emotional connection that charges human-dolphin contact. Thus, the subsequent sections explore how marine tourism has perpetuated this popular leisure activity and informed current exchanges for pleasure. An introduction to the issues and attributes of these human-dolphin interfaces will be provided in the tourism context with particular attention toward the importance of eye 'gaze' and bodily contact. The chapter concludes with an overview of the debates in recent literature concerning the moral viability of dolphin-swims and the motivations of swim participants.

Human constructions of dolphins

Marine wildlife tourism is aimed at delivering a unique experience by offering close interactions with wildlife, particularly dolphins. Evernden (1999) and Livingston (1994) argue that engagement with the natural world can foster an ethic of care and a desire for conservation, but if this is indeed true, what is the cost to the animal that might be at the centre of this engagement? Differences in perceptions illuminate a number of dichotomies relevant to the experience: wild versus captive, mediated versus in-the-flesh, common versus endangered - not all encounters are equal. The meanings produced through the tourism experience are essential to understanding the role of wildlife in the social construction of nature. As perceptions change with time, it is these shifting opinions that help to define the place of wildlife in contemporary society.

The relationship between humans and non-human animals is formulated around shifting priorities between animals themselves and anthropocentric, capitalist initiatives. Non-

human animals are blurred between representations of the real and simulated, influencing moral boundaries (Fudge, 2002). The human-dolphin interaction itself is open, based around chance and play, emphasizing performance. How people behave and view this enactment of dolphins is influenced by individual perspectives of nature. According to Evernden (1992) there are three types of nature that shape human attitudes; ‘nature as object,’ ‘nature as self,’ and ‘nature as miracle’. Nature as object conceives of the natural world in an anthropocentric manner, treating non-human animals with no subjectivity but as objects to be explored, and in existence to serve human desires (Evernden, 1992). Nature as self is rooted in a deeper, moral obligation to the natural world with concern for non-human animals as an extension of the self; nature as miracle treats the environment as unpredictable and wondrous (Evernden, 2008).

Western culture’s extension of moral consideration to non-human subjects often selects pets, ‘cuddly’ mammals, or rare wildlife over other non-human animals (Olmert, 2009). Bekoff (2008) makes this observation by comparing human attitudes towards wolves and whales, both of which were historically persecuted. Changes in opinion towards these animals are reflective of human culture; Bekoff (2008:397) states ‘while many people swim with dolphins, few if any truly dance or howl with wolves’. Dolphins are a good example of this selected favouritism based on their widespread appeal and famed altruism (Barney, Mintzes, and Yen, 2005). The promotion of dolphins as creatures that are unique from humans is explored in science fiction novels and movies such as *The Day of the Dolphins* (1973), and *The Hitchhikers Guide to the Galaxy* (2005). Contrariwise,

dolphins are commonly portrayed as similar to humans as well, possessing valued human characteristics such as intelligence, altruistic behaviour and play.

Socially constructed ideas of dolphins as simultaneously exotic animals and happy friends, deeply affect the way humans orient their behaviour towards this non-human animal. The problem lies in the misconceptions that these false characteristics produce. People are reluctant to allow a child to play with an unknown dog, but seem to have no problem trusting a wild dolphin (Bekoff, 2003). This example demonstrates how deeply perceptions of non-human animals are engrained into human culture. Cloke and Perkins (2005) contend that representations may not be accurate, as people tend to divorce social associations from actual behaviours (i.e. not all dolphins are the same). Anthropomorphic depictions of popular non-human animals such as dolphins are created to fit human needs. It is precisely these historical interpretations that account for identification with certain species. Desmond (1999) recognizes this conflicting tension regarding cetaceans (that is, dolphins and whales) as outliers straddling the lines between being human and mammalian in water. Even amongst cetaceans, a hierarchy of likeability exists correlating to commonly encountered species through captive facilities and media; bottlenose dolphins (e.g. *Flipper*) and orcas (e.g. Keiko “*Free Willy*”) tend to be favoured over less charismatic relatives such as river dolphins.

The mystery of dolphin lives has played into folklore across the globe, connecting dolphins with magical powers and merging with people on land. In South America, some view the river dolphin as a mysterious being that can shape-shift and capture souls

(Montgomery, 2003). Dolphin spiritualism, the idea that dolphins have the ability to improve physical and spiritual well-being, has created a growing industry for those looking to participate in what has become known as dolphin therapy. Many people report the ‘dolphin effect’ following a dolphin-swim, testifying to feelings of change or healing, including the alleviation of chronic depression, removal of pain, and recovery from illness (Taylor, 2003). Burnett (2010) explains that supporters of the ‘dolphin effect’ believe that cetaceans have the ability to scan the human body for palliative purposes. Although there is little evidence to support this, the use of sonar from dolphins has been one hypothesis for these reports.

Dolphin tourism development

The growth of dolphinariums throughout the world has increased the perception of dolphins as entertainers, extending these expectations to wild dolphins as well. These images are promoted by both captive and wild tourism facilities that falsely represent dolphins as perpetually happy and ready to perform. Prior to interest in wild marine tourism, a long-standing history of spectator encounters with captive cetaceans is evident. In 1860, P.T. Barnum placed two whales on display in his American Freakshow, followed by the New York Aquarium (which first displayed dolphins in 1913) and the Florida Marine Studios in 1938 (Hughes, 2001). After the film release of *Flipper* in 1963 and the subsequent television show (1964-1967), the popularity of dolphins increased dramatically, reinforcing human interest.

Like captive exchanges, dolphin-swim activities are dependent on performance. Intrigue for close encounters has contributed to the formation of destinations that have become known for opportunities to interact with dolphins. For example, locations such as Shark Bay, Australia, Kailua-Kona, Hawai'i and Kaikoura, New Zealand now revolve around dolphin tourism, altering how locals and tourists value these places. Shifts in values can occur organically like Shark Bay's feeding program or be produced intentionally as exemplified by the first lone, sociable dolphin in Narin, Scotland (Cater and Cater, 2007). Certain countries have prospered more than others in the popularization of their marine tourism economies as evidenced by infrastructure development focusing on coastal cetacean populations. The processes by which these locations are constructed rely not only on economic development, but also on the cetaceans themselves (Cloke and Perkins, 2005). An example of this is in Samadhi, Egypt, where until 2000, the dolphins were mostly a side attraction; however, as word spread, an increasing number of tourists arrived. Now up to 800 people per day visit the reef for the sole purpose of seeing the dolphins (Notarbartolo-di-sciara, Hanafy, Fouda, Afifi, and Costa, 2009). An upsurge in dolphin tourism focused on swim activities with the Hawaiian spinner dolphins (*Stenella longirostris*) has also occurred in Hawai'i (Courbis, 2007; Östman-Lind, Driscoll-Lind, and Rickards, 2004; Wiener, Needham, and Wilkinson, 2009) (see Figure 4). Hu, Boehle, Cox, and Pan (2009) validate this interest in tourists who want to swim with Hawaiian spinner dolphins based on a large jump in internet hits on dolphin-swims from 2,250 in 2002 to 31,400 in 2007.



Figure 4. Hawaiian spinner dolphin in front of snorkelers in Wai‘anae, O‘ahu. Image credit: C. Wiener.

Other areas such as American Samoa boast cetacean populations that have not been targeted for tourist activities; however, it is only a matter of time before these animals are considered as profitable elements. Once infrastructure for dolphin tourism arises, word quickly spreads and without regulation the number of tour operators jumps from one to many (Hoyt, 2001; Orams, 1997). The advertising and word of mouth from people who have previously participated build potential participant’s knowledge. When the infrastructure cannot support the number of visitors and no long-term planning is implemented, tourism becomes an immediate problem.

Historically, Australia and New Zealand are two countries that have offered the greatest variety in dolphin opportunities (Wiener, 2013). Other dolphin programs including swimming and feeding activities operate internationally, but lack policy frameworks that exist in Australia and New Zealand. For example, New Zealand’s Marine Mammal Protection Regulations (1992) enforce a no-wake for boats within 300 meters of dolphins

and allow a maximum of three boats (Lück, 2003). In Victoria, Australia, the Department of Sustainability and Environment created site-specific regulations (1998) prohibiting tour vessels from approaching dolphin schools closer than 200 meters (Howes, Scarpaci, and Parsons, 2012). Elsewhere, the Great Barrier Reef Marine Protection Agency (2003) requires whale-swim operators to complete sighting sheets for every encounter (Curnock, Birtles, and Valentine, 2013). In the United States, it is considered illegal to feed or harass wild dolphins under the Marine Mammal Protection Act (MMPA); however, there is still a plethora of dolphin interaction programs. To further complicate the matter, each state has its own guidelines for commercial boat tours and the five federal regions also differ in their approach regarding vulnerable species (Orams, 1995). Of greatest concern are the nations that have no protection or laws at all, such as Tonga and Brazil. In Brazil, uncontrolled feeding occurs at two locations and people swim with at least one food-provisioned dolphin (Samuels, Bejder, and Heinrich, 2000).

Marine tourism management varies across a continuum of protection dependent on the activity, location, and research availability. In the United States, state-controlled game programs were the first to execute management following implementation of 'wise-use' conservation brought in by federal agencies (Duffus and Dearden, 1990). International management bodies are also beginning to take interest in regulation of marine mammal swim programs, including the International Whaling Commission (IWC). One of the greatest challenges for global organizations is to provide consistency in guidelines as mechanisms differ between countries. Currently, Australia, Dominica, the United

Kingdom and New Zealand each have their own guidelines for marine mammal interactions (Constantine, 1999).

Many countries use marine tourism as a tool to elevate their status in international relations (Cater and Cater, 2007). Taiwan, for instance, has shifted from dolphin slaughter to marine tourism as a politically-friendly way to generate income (Chen, 2011). In Zanzibar, 9% of the Indo-Pacific bottlenose dolphin population was killed annually as a result of hunting (Christiansen, Lusseau, Stensland, and Berggren, 2010). By 1992, villagers replaced the dolphin hunt with swimming activities that became a contributor to the local economy (Christiansen et al., 2010). Globally, dolphin-swim tourism is not developing sustainably, which is revealed by accounts of harassment towards dolphins and studies showing negative effects on populations (Christiansen et al., 2010). The opposite problem exists in some communities, where transition from harvesting practices to marine tourism is proving to be difficult. In Norway, for example, whalenwatching is considered a cultural attack on traditional whaling (Constantine and Baker, 1997).

Several studies have examined how attitude, environmental stimuli, and physiological drives influence desires to pursue the viewing of, and interacting with, wildlife. Understanding tourist preferences is important in decision-making regarding permitted activities, levels, and types of interactions. Duffus and Dearden (1990) argue that innate or instinctive reactions dominate contact with wildlife, differing very little amongst

tourist due to pre-cognitive human responses. Amante-Helweg (1996) and Semeniuk, Haider, Beardmore, and Rothley (2009) disagree, emphasizing heterogeneity of populations. Amante-Helweg (1996) demonstrates that most respondents interpret dolphin behaviour anthropomorphically and perceive dolphins as socio-centric; holding attributions of spirituality, altruism and interspecies sociability. Human perceptions act as important motivators for activities, and do not remain static. The framing of events is vital to the tourist experience.

Specialization is another point to consider as a growing number of people become comfortable with dolphin-swim activities. Duffus and Dearden (1990) call attention to these 'rare' opportunities that are sought; the generalist population of tourists becomes specialized. As more people learn about human-dolphin interactions and develop a greater comfort level with these relations, they are likely to repeat the experience and expect more each time. Participation in dolphin-swims is done by all swimming levels; however, those who have greater comfort in the water are able to engage more easily with the dolphins. This process of specialization has the ability to transform small-scale experiences to mass tourism, increasing frequency and popularity by the general public. In Hawai'i, 204 participants were surveyed about their motivations for exploring a swim-with-dolphins experience. Of this group, 81% stated that the uniqueness of the opportunity was the number one reason for involvement, and 76% of those surveyed were first time dolphin-swimmers (Wiener, 2015). Over time, dolphin-swims will become more common, and the skill level of participants will shift increasing pressure for more interactive experiences. Once people are introduced to this activity, there is a risk that

they will seek out these encounters on their own, placing pressure on tour operators to discover new, less developed sites. Hawai‘i has already realized this trend, with once ‘secret’ dolphin-swim bays that have become overrun with visitors pursuing dolphin-swims. This has been a common trend in marine tourism, contributing to the degradation and popularization of once unknown locations.

Negative effects of dolphin tourism

A large number of studies have illuminated the negative effects of dolphin tourism on both individual and entire populations (Bejder et al., 2006; Howes et al., 2012; Lusseau, Slooten, and Currey, 2006; Lundquist, Gemmill, and Würsig, 2012; Stockin, Lusseau, Binedell, Wiseman, and Orams, 2008). The majority of these impacts relate to altering dolphin behaviour, impacts of vessel noise, and habituation as a result of human interaction. Samuels et al. (2000) document the negative risks associated with taming of wild dolphins; habituation has led to cetaceans being harassed by humans, decreasing maternal behaviour, increasing susceptibility to shark attacks, juveniles becoming dependent on fish hand-outs, and lower rates of calf survivorship. Specific pod reactions to dolphin tourism most notably consist of changes in dolphin activity (Constantine, 2001; Lundquist et al., 2012; Lusseau and Higham, 2004), shifts in speed (Williams, Trites, and Bain, 2002), movement (Bejder et al., 2006), diving behaviour (Janik and Thompson, 1996; Nowacek, Wells, and Solow, 2001), group formation (Bejder, Dawson, and Haraway, 1999) and vocalization (Buckstaff, 2004). These impacts, if continued over the long-term, may result in permanent behaviour change and potentially threaten individuals and populations (Christiansen et al., 2010; Martinez and Orams, 2009).

Signs of avoidance are the most common mechanism for exploring effects of tour boats on dolphin populations. In addition to boater presence, the way that vessels are maneuvered (e.g., changes in speed, direction, and approach), boat density, and distance between dolphins and vessels are important to dolphin response (Barr, 1997; Constantine, 2001; Lusseau, 2008). Christiansen et al. (2010) examined the behaviour of dolphins in the presence of tour boats, concluding that dolphins are less likely to stay in resting or socializing activity when boats are near. Christiansen et al. (2010) also raise concerns regarding the interruption of sexual behaviours leading to a lowered rate of successful mating. Other studies have shown notable concerns regarding behavior shifts of the Hawaiian spinner dolphin due to disturbances from tour vessels looking to interact (Courbis and Timmel, 2009; Delfour, 2007; Ostman-Lind et al., 2004). As a result of the observed negative effects, the United States National Oceanographic and Atmospheric Association (NOAA), has begun to consider new rules to regulate boat activity around spinner dolphins.

Tour operators have been documented maneuvering in an aggressive manner leading to erratic boat navigation and competition (Constantine 2001; Lusseau 2008). These demonstrations could be misinterpreted as predatory techniques by the animals themselves (Lusseau and Higham, 2004). Tour boats often use high speeds and frequent direction changes in order to drop off and pick up swimmers in the water, potentially leading to long-term noise disturbance (Jensen, 2009). Participants are also responsible for loud distractions through voice and physical movement. Some companies encourage swimmers to create deliberate noise such as singing, as a form of generating interactions

with wild dolphins (Martinez and Orams, 2009). Concerns have been raised regarding specific populations of dolphins who are the focus of these swim experiences. The majority of research on the effects of dolphin-swim tourism has focused on boat interactions, ignoring the in-water swimmers' influence.

In-water dolphin-human connections

Pre-existing images and contemporary culture shape human expectation of a dolphin encounter. Urry (1990) explores the idea that tourists undergo their travels through an already existing frame created by representations found in media and elsewhere. Many examples illustrate this, from the previously mentioned *Flipper* movie and television series, to the resurgence of Australia's snorkel tourism following the release of the children's film *Finding Nemo* (2003) (Hahm, 2004).

Cloke and Perkins (2005) explore the mediation of dolphins in the tourism experience, highlighting the excitement associated with the anticipation of engagement, the drive for filming the encounter, and the connection felt through interactions. Other considerations not investigated include feeling the aquatic environment and the equipment needed to swim in it. Swimmers require wetsuits to keep warm, snorkels and masks to breathe and see underwater, and fins to keep pace with the dolphins. Entering the unknown ocean requires the aid of technologies to maintain what cetaceans naturally do on their own, but how do these additions change the experience? In fact, many participants in dolphin-swims have little to no exposure to the ocean on a regular basis. In 2012, a survey in

Hawai'i demonstrated that 23% of participants had basic to no experience swimming in the ocean and 45% had basic to no snorkeling skills (Wiener, 2014).

Outside of the water, dolphin swimmers have reported physical and mental sensations including sensitivity to stimuli, amplified vitality, and elation (Lemieux, 2009; Ocean, 1997). One of the unique characteristics related to wild dolphin tourism encounters is that autonomy for participation is given to the species itself. In previous studies exploring encounters, dolphin performance provided the single most significant characteristic of the interaction including proximity, contact, timing, and acknowledgement (Amante-Helweg, 1996; Constantine, 2001; Scheer, 2010). Given this variety, the most common definition of a successful swim includes one or more dolphins within five meters of a swimmer (Constantine and Baker, 1997). Those who participate in dolphin-swims frequently have claimed to develop a continued rapport with the same dolphins. Of 47 dolphin-swim operators interviewed in 2012, 70% said they recognized individual dolphins, and 64% felt that the dolphins recognized them (Wiener, 2015).

Making contact

Capturing photographs during the dolphin-swim is a priority amongst many participants, actively constructing how the swimmer perceives the event (Wiener, 2013). Many times people become consumed by the effort to put the moment on film, they view the experience from behind the lens. Cloke and Perkins (2005) and Warkentin (2007) observe that very few people savour the encounter without the determination of getting the right shot, trying to visually represent the peak in a dolphin-swim that can be

refabricated with family and friends. Dolphin-swim companies play into this desire by adhering to particular poses to produce this exact image. Many businesses offer to take video of participants so that the experience is guaranteed to be captured. It is this need to encapsulate the moment that places pressure on the operators to provide a close-up encounter. The nearer the participant can get to the dolphin, the better the image will be. Facial features and, in particular, eye contact seem to be the target of observation.

Making visual contact with another species is considered to be one of the deepest connections made during wild dolphin experiences (Curtin, 2006). Swimmers report a stronger emotional relationship when they feel acknowledged by the participating dolphin through eye contact or dolphin-initiated approach (Wiener, 2013). How much participants can see during their swim is a factor in the building of intimacy. Face to face interaction is desired to create closeness in human-dolphin relations. Unfortunately, cetacean behaviours are often misinterpreted because participants misread facial attributes when they do get close, assuming that dolphins are happy because of the upturned curve of their rostrum, or a twinkle in the eye (Desmond, 1999). Some species are challenged by direct eye contact and perceive this behaviour as threatening (Desmond, 1999). Misinterpretation is common during the dolphin-human exchange because it contradicts the desired experience that people have come to expect. Emphasis on dolphin encounters often misses a critical piece of this relationship by ignoring the non-human animal's experience (Wiener, 2013). The eyes of dolphins during these interactions are represented as important social cues used to infer mental states; however, just because there is an

implied understanding does not mean that the dolphins are ascribing the same meaning to their actions (Keeley, 2002).

Similar to the visual experience, reflection on tactile interaction must be considered; dolphins are sensitive to touch and are particular in how they initiate contact (Wiener, 2013). Cetaceans communicate with their bodies using flukes, pectoral fins, teeth, and rostrums to demonstrate pleasure, warning, and affection (Dudzinski and Frohoff, 2008). Bekoff (2000) highlights examples of interspecies communication problems during petting, feeding, and swimming programs. Visible stress and aggression can be mistaken for playful behaviour leading to human injury from being bitten or hit by a fluke (Bekoff, 2000). Additionally, humans may communicate unintentionally through their body language, e.g., increased adrenaline in the human from excitement that may cause chasing behaviours (Wiener, 2013).

The desire for connection between humans and non-human animals extends beyond facial recognition and tactile contact. The human body connects to larger networks of meaning that produces social and cultural relations through hands and bodies (Creswell, 1999). Emotions are easily evoked in the human participant; being in the dolphin's proximity is enough to draw excitement (Besio, Johnston, and Longhurst, 2008). The method in which marine mammal interactions take place affects the overall perspective, and the involvement of the senses and imagined experiences are important in these occurrences. For example, the viewpoint from a boat above the ocean will be different from someone who is watching from land. Not only does proximity play into this

experience, but so does the spatial plane in which the dolphin and human interact. Swimming on parallel levels and speeds will provide a more intimate encounter, compared to a 'birds-eye view' observation. Cater and Cater (2007) reason that the need to get 'up close' stems from a desire for connection. The desire to see animals in motion is critical to these experiences. Close interactions with marine animals whose behaviour is considered authentic are 'supposedly' unaffected by human presence (Desmond, 1999). Unfortunately, constant human influence does effect animals and the behaviours displayed are most likely not positive responses.

The moral viability of dolphin-swims

Humans assume that dolphins enjoy swimming with people as much as we relish swimming with them, ignoring the fact that people can inflict unintentional harm. Warkentin (2007) notes that what is missing in dolphin-swims is the etiquette of invitation, presenting a choice that acknowledges the agency dolphins possess. Even when dolphins participate of free will, they exert energy unnecessarily that is better kept for themselves (Wursig and Wursig, 2003). Cumulative effects of these exchanges are hard to gauge based on daily disturbance, but shifts in behaviour are almost inevitable and may have long-term implications. In 2000, the IWC formally addressed in-water engagement with free ranging dolphins, stating that even the most well intentioned human contact is accompanied by unpredictable and cumulative risks (Frohoff and Peterson, 2003). The greatest problem with dolphin tourism is that human affection imposed onto dolphins has been misplaced, causing various disturbances in populations from frequent human interactions; in other words, humans are loving dolphins to death.

Many fields that relate to non-human animals have dedicated courses and research for humane treatment; however, no equivalent process has appeared in marine tourism despite the central use of cetacean species (Shani and Pizam, 2008). Some wildlife-based tourism sectors such as bird and whale watching have developed ethics guidelines for their activities (Hoyt, 2003). However, dolphin tourism has evolved so quickly that the regulations have not been able to keep up.

Regardless of the type of interaction, dolphins are consumed as part of a unique experience. However, dolphins play their own roles as independent actors in dolphin-swim activities and can choose to avoid or approach boats (Cater and Cater, 2007; Shani and Pizam, 2008). Unstructured dolphin-swim programs have developed uncertainty in how operators and participants should behave. For example, what is an acceptable distance between tourists and dolphins (Garrod, 2008)? Regulations such as a maximum approach distance are important for participants who normally do not have close encounters with wild animals and, therefore, have little experience on which to base their decision making (Garrod, 2008). The multiplicity of etiquette practiced by operators is a concern considering the growth of dolphin tourism, specifically swim programs in developing countries. While whale watching is still happening in coastal areas off larger population centres, dolphin-swims are growing in much smaller and more remote areas due to ease of accessibility (Hoyt, 2003).

Conclusion

Dolphins are a well-known group of cetaceans, but common perception of these wild animals as human-like beings sparks a desire in people to interact with them across unfamiliar environments such as the ocean. Emphasis on emotional connections during human-dolphin contact has driven the popularity of wild swims in the tourism sector. This yearning to 'swim with dolphins' has resulted in worldwide appeal, transforming marine environments into popular tourist destinations. Public attitudes towards marine mammals ultimately reflect the way dolphin tourism is developed and utilized; shadowing Evernden's (1992) three categories of attitudes towards nature. The objectification of dolphins from commercial profit has been demonstrated by businesses that put the demands of commerce ahead of dolphin needs. For the most part, dolphins have not been given subjectivity, rather treated as objects to be explored and in existence to serve human desires (Evernden, 1992). However, even when a deeper, moralistic approach to dolphin-human interactions occurs, it can often be misguided by a romanticized notion and further fuel the commercialization of this species. Evernden (2008) warns that the unpredictability and mystery that goes along with wild non-human animals needs to be reinforced in these situations.

The moral line between what is right and wrong during human-cetacean interaction is largely unknown, and how people affect the perceptions of dolphins will never truly be understood. Questions remain unanswered about what to do when a wild dolphin becomes aggressive or habituated. Regardless of the answer, these queries demand consideration as the relationships between humans and dolphins continue to be re-made.

In both research and story, humans have demonstrated that dolphins are individuals with varied personalities and high levels of emotional, cultural, and social intelligence. How humans deal with this information will greatly impact the future relationship that people will have with dolphins. Although a range of regulations has been put in place by countries that already permit dolphin-swims, further investigation is needed into the long-term effects of these rules, and to better explore in-water interactions. Additionally, policy must balance the desires of the surrounding communities with protecting dolphin populations. What are the wishes of the local companies that will need to be balanced with dolphin well-being, if dolphin-swims are not outlawed? Dolphin-swim tourism will not decrease, but if humans begin to critically examine their behaviours, then they can attempt to work towards better protection and understanding.

Chapter 3: Friendly or Dangerous Waters? Understanding Dolphin-Swim Tourism Encounters

Preface

Friendly or Dangerous Waters? Understanding Dolphin-Swim Tourism Encounters is the second of two literature chapters that provide an understanding of the dolphin tourism industry and the related research that exists. This chapter has some review from the previous chapter, but offers a more in-depth application of the literature, examining previous dolphin tourism studies and the intersection of dolphins in contemporary tourism research. A comprehensive literature review of academic papers that were published over a period of 16 years spanning from 1995 to 2011 is included, identifying trends in the natural and social science research themes and content. Prior literature reviews on swim with dolphin research have been completed (Samuels and Spradlin 1995, Scheer 2010), however, they fail to include work on human experiences, and do not focus on the social implications of human-dolphin connections. This chapter helps to elucidate the lacunae in the existing research and better inform the study practices determined for the dissertation research presented in Chapters 4 through 6. *Friendly or Dangerous Waters? Understanding Dolphin-Swim Tourism Encounters* was published in 2013 in the *Annals of Leisure Research* (Vol. 16, No. 1, pp. 55-71).

Chapter Summary

An upsurge in dolphin tourism has occurred over the past thirty years, including a steady increase of operations focused on swim activities. Apprehension over the rise in dolphin-swim tourism on a global scale has led to few studies examining the social impacts of this activity. Contemporary issues pertaining to dolphin-swim tourism will be discussed by using existing literature to present an overview of dolphin-swim experiences, and review and contrast the differences in human-dolphin exchanges. Prior literature reviews on swim with dolphin research have been completed (Samuels and Spradlin, 1995; Scheer, 2010), however, they fail to include work on human perceptions of these experiences, and do not focus on the social implications of human-dolphin connections. This paper will update the literature including some of the research from the past ten years emphasizing tourist perceptions of dolphin-swim activities.

Introduction

The origin of tourism as a social phenomenon is important to present-day research on human-animal relations. In the past three decades the study of tourism has spanned the social sciences including sociology, anthropology, geography, political science and economics (Cohen, 2008). This diversification of tourism studies has resulted in a larger scope of research, with expansion of particular niche tourism categories such as wildlife-based tourism. Social science contributions to nature-based travel began in the 1940s with Aldo Leopold's work on environmental ethics and wilderness conservation (Duffus and Dearden, 1990). Urry (1990) explains that participation in tourism is a socially organized behavior influenced by society, historical periods, and communal groups. Clearly, the connection between culture, social perception, and tourism is undeniable. Long-standing interactions with animal species have been culturally engrained, with many political and social circumstances contributing to the shaping of present-day wildlife tourism. While the 'social experience' plays a considerable role in tourism studies, the geography or place in which these activities occur is also critical (Gren and Huijbens, 2012). The parallel development of wildlife tourism and environmental politics has created a platform for public interest in specific animals and locations, including many marine mammals and habitats.

Marine wildlife tourism is designed to provide a unique experience by making possible close interactions with aquatic fauna in specific geographic locations. Within marine wildlife tourism, encounters with cetaceans (whales and dolphins) have been particularly

prevalent. The recent popularity of interactive dolphin-swims has led to the expansion of businesses that incorporate in-water 'swimming' experiences. The processes by which these locations are constructed are reliant not only on economic development, but also on the cetaceans themselves (Cloke and Perkins, 2005). Human fascination with dolphins reflects a long and variable relationship that has been shaped by cultural, social and scientific perspectives.

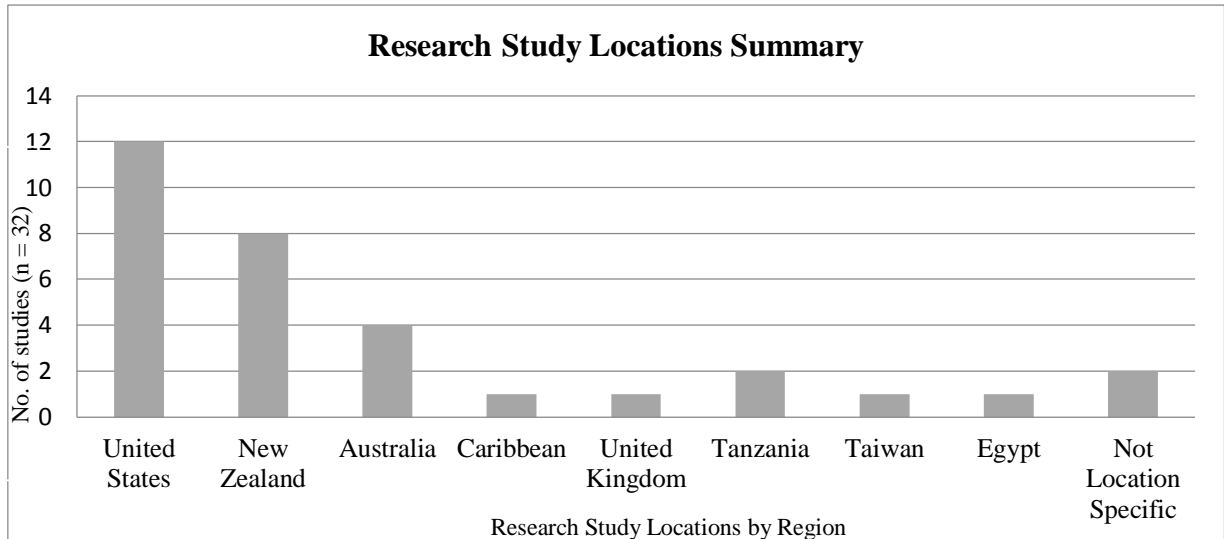
This paper will use existing literature to present an overview of dolphin-swim tourism by looking at animal encounters documented by academic papers, and extrapolate the existing trends and social meanings produced through these experiences. Exploring social science writings on dolphin tourism will help to place the topic within the broader tourism and leisure literatures. Summation of dolphin-themed writing will demonstrate the current knowledge in dolphin tourism work and consider the direction that research should be taken in the future.

Methods

A comprehensive literature review of academic papers that were published over a period of 16 years spanning from 1995 to 2011, was completed to identify research related to dolphin-swim tourism. Papers were divided into natural and social science research and then reviewed by theme and content. Trends were identified and compiled, which are reflected in this paper. Figure 5 offers a summary of dolphin-swim research locations

frequently identified in the literature. Most notably, the United States (38%) and New Zealand (25%) have been the source of the majority of dolphin tourism studies ($n=32$).

Figure 5: Dolphin tourism natural and social research study locations ($n=32$)².



Themes were extrapolated from the literature, exploring the different types of dolphin tourism; emphasis was placed on tourist interactions with dolphins, tourist perceptions and motivations, visitor preferences, and the sensory experience of dolphin-swims.

Existing research has frequently discussed dolphin tourism without specifically characterizing the activity. From this literature search, a definition for dolphin tourism was constructed as any recreational or commercial dolphin watching, feeding, or swimming activity conducted in either a natural or captive environment. ‘Dolphin’ as a term was also defined and employed as a way to address cetaceans most commonly involved in ‘dolphin tourism’, and exclude ‘whale watching’, which typically emphasizes

² Canada not included as no research study literature was found for the country.

larger sized marine mammals. As a result, ‘dolphins’ were considered to be a large group inclusive of toothed, small cetacean species (under ten feet in length), in both natural and built environments. Dolphin tourism can vary dramatically depending on the type of activity pursued; there are individual differences between feeding, swimming and watching options (Bulbeck, 2005). The majority of dolphin-swim programs involve coastal dolphin species; however, there are a few exceptions where swimming in open-ocean occurs.

Dolphin tourism is a highly valued activity for participants and others who rely on it for their livelihood. This literature review lays a foundation for what criteria have been ascribed to previous dolphin tourism research in the social sciences. Analysis of omissions in the research will be discussed and the direction that should be taken in future studies will be considered. It is important to understand the previous literature as it relates to dolphin-swim tourists and their behaviors, allowing for comparison of current experiences to previous literature.

Dolphin tourism

What constitutes a dolphin encounter?

Several studies look at human-dolphin interactions during wild swims to consider what constitutes successful dolphin contact for the participant. Newsome, Dowling, and Moore (2005) describe the proximity of dolphin encounters along a continuum from direct physical contact to viewing only, depending on characteristics and status of species, the

environmental situation and the animal's sense of control. Scheer (2010) defines a successful dolphin encounter as a 'swim with one or more cetaceans within 20 meters for 15 seconds or longer'. Interactive behaviors are further defined by the 'initiation of one plus cetacean directed towards a swimmer within the two to twenty meter range' (Scheer, 2010: 445). Other research uses different characteristics such as length of swim time (Amante-Helweg, 1996) or proximity (Constantine, 2001) to define human-dolphin interactions. The most widely used definition considers a successful swim attempt when one dolphin is within five meters of a swimmer (Constantine, 2001; Constantine and Baker, 1997).

Captive dolphin interactions

Three types of interactions are available in captive dolphin facilities including feeding, swimming, and dolphin assisted therapy, although opportunities continue to grow in order to capitalize on market interest (e.g., dolphin trainer for a day, dolphin t-shirt painting) (Curtin, 2006). Figure 6 demonstrates a typical captive enclosure with three bottlenose dolphins in an aquarium in Spain. Captive marine environments including aquaria, oceanaria, dolphinarium, and open-water sea pens are believed to be an excellent way to bring marine species to the attention of the public, thereby supporting education and conservation (Ballantyne, Packer, Hughes, and Dierking, 2007). Scholars such as Amante-Helweg (1996), Bulbeck (2005) and Saltzer (2001) reinforce that direct contact creates a more meaningful experience leading to a stronger conservation ethic, however, to say that all facilities provide equally enriching experiences is quite a generalization.

Other scholars such as Lück and Jiang (2007) and Warkentin and Fawcett (2010) refute claims of the aquarium as an institution of education and conservation. In one study, Lück and Jiang (2007) explore the handling of marine mammals, rejecting the way aquaria market captive experiences.



Figure 6: Typical concrete viewing tanks found in dolphinarium. (C. Wiener)

Problems with dolphin feeding pools have also been noted, as exemplified by a study which showed significant risk to the dolphins from crowding, noise and constant stress (Frohoff, 2003). Captive dolphin-swims differ from feeding pools, comprising of sessions that have up to twelve people spending 20-40 minutes standing where dolphins directly interact with participants by petting, kissing, or towing swimmers (Curtin, 2006).

Captive environments democratize access to large and exotic species, allowing the general public more exposure to marine mammals (Bulbeck, 2005; Desmond, 1999; Urry 1990). The 'wild' experience differs in that it is often sold to a higher-end market requiring more planning, knowledge, and finances, however, increasing shifts to wild interactions have been noted (Hughes, 2001). Even in wild environments, habituation of dolphins from human actions of feeding and swimming occurs, as demonstrated by the renowned Panama City dolphin, Beggar. Famous for accepting handouts like fish and hot dogs, Beggar died prematurely in September 2012 (Nohlgren, 2012). In a 2010 study, Beggar was followed and over 3,600 human interactions were observed including 169 attempts to feed him 520 different food items (Cunningham-Smith, Colbert, Wells and Speakman, 2006).

Socially constructed ideas of dolphins as altruistic, happy friends deeply affect the way humans orient their behavior towards this species. The problem lies in the misconceptions that these false characteristics produce. Numerous examples of dolphin-swim encounters have resulted in injury, life-threatening behavior and even death to dolphins (Desmond, 1999; Orams, 1997; Samuels and Spradlin, 1995). Unprovoked attacks are rare but do occur, as demonstrated by a violent assault from an aggressive short-finned pilot whale off the coast of Hawai'i (Shane, Tepley, and Costello, 1993). Dangerous encounters have occurred in controlled and captive dolphin-swim settings as well. Smith, Samuels and Bradley (2008) show that rates of dangerous contact are heightened when wait times before feedings are extended in captivity. Notwithstanding,

that these risks exist, there is a noticeable lack of comment on human perceptions of such threats in the literature.

Wild dolphin-swim interactions

Media featuring the social nature of wild dolphins has led people to view and swim with these animals (Lemieux, 2009). Local communities witnessing the demand for interaction began taking people out in exchange for money, leading to the formation of wild dolphin tour businesses (Hughes, 2001). The construction of wild dolphin ‘experiences’ eventually developed into big business leading to greater requests for marine mammal interactions in natural environments. Moray Firth in Scotland is one of the first examples of this process (Hughes, 2001). Wild dolphin-swim activities are also dependent on performance, and contribute to the formation of place-based human approaches to wild dolphin environments. For example, locations like Shark Bay, Australia or Kaikoura, New Zealand now predominantly revolve around dolphin tourism, shifting how locals and tourists value these locations.

Hu, Boehle, Cox, and Pan (2009) validate increased interest in tourists who want to swim with wild dolphins based on a large jump in internet search hits about dolphin-swims in Hawai‘i from 2,250 in 2002 to 31,400 in 2007. This has also been demonstrated in the annual gross income from Hawaiian wildlife-viewing operations, which jumped from \$163,480 USD in 1999 to \$1,955,181 USD in 2006 (NOAA Fisheries, 2007). Hawai‘i has become a hotspot for ‘wild dolphin-swim experiences’ due to the predictable Hawaiian

spinner dolphin (*Stenella longirostris*) population, yet, it is just one example of the many growing hot spots for dolphin tourism. Studies like Hu, Boehle, Cox, and Pan (2009) highlight the economic value of dolphin tourism by understanding how consumers value dolphin excursions. This area of research has wide implications for exploring the user groups and demands of the dolphin tourism industry that goes beyond short-term profit maximization. Surprisingly, Hu et al. (2009) are currently one of the few studies to provide economic predictions for dolphin tourism.

In wild interactions, both the human participant and the dolphin are provided with more freedom; however, sharing the experience with a large group of humans can take away from the naturalness of the experience (Besio, Johnston, and Longhurst, 2008). Crowding of people surrounding dolphin pods can detract from the activity at hand. Less structured swims inherent in wild, open-ocean programs, develop more uncertainty in how operators and participants should behave, creating questions like ‘how close one should get to a dolphin?’ (Garrod, 2008). This is markedly important for participants who have little knowledge or contact with any type of animal and, therefore, have little experience to base their decision making on (Garrod, 2008). The multiplicity of etiquette practiced by operators is a major concern considering the growth of marine mammal tourism, specifically wild dolphin-swim programs in developing countries around the world. Not all wild dolphin-swims are created equally, and therefore experiences will vary depending on location, dolphin species, and individual companies.

Global expansion of dolphin tourism

The exponential growth of dolphin tourism over the past twenty years has been exemplified by countries such as Australia, which target over 70 marine species as part of their thriving tourism industry (Birtles, Valentine, and Curnock, 2001; Scheer, 2010). Historically, Australia and New Zealand are the two countries offering the greatest variety in dolphin tourism opportunities. New Zealand's management system through the state conservation agency (Department of Conservation) allows wild dolphin-swims, while Australia boasts three controlled wild dolphin feeding programs: Monkey Mia at Shark Bay, Tangalooma on Moreton Island, and Burnbury. Monkey Mia is an example of a stricter management and enforcement dolphin feeding program, with no touching or swimming allowed (Cater and Cater, 2007). Details of Australian dolphin tourism are important to consider as they are primary examples of government-driven management and infrastructure.

Certain countries have prospered more than others in the popularization of their marine tourism markets based on development of surrounding cetacean populations. A growing reliance on marine tourism, like dolphin-swims, exists in many developing countries as a tool to elevate their local economies (Cater and Cater, 2007). Taiwan, for instance, is a country that is shifting from major whaling and dolphin slaughter to marine tourism as a politically friendly way to generate income (Chen, 2011). In Zanzibar, the villagers from Kizimakzi have replaced the local Indo-Pacific bottlenose dolphin hunt with swimming activities becoming a major contributor to the local economy (Christiansen, Lusseau,

Stensland and Berggren, 2010). Other communities have had a more difficult time transitioning from whaling to marine tourism (Parsons and Rawles, 2003).

When the infrastructure cannot support the number of visitors and no long-term planning or management is implemented, tourism becomes an immediate problem. Issues surrounding human conflict include:

- debates over rights to natural resources (e.g., ownership of shoreline);
- damage to public property (e.g., loss of fishing grounds due to marine tour boats);
- historical and cultural relations with resources (e.g., native ancestry of certain marine species);
- compatibility of user interests (e.g., kayak user displacement due to other boats)

(Cater and Cater, 2007).

In order to manage stakeholder relations, marine tourism policy is extremely important and requires research to understand how to mitigate both short and long-term effects of harassment and disturbance, and to monitor rule implication and enforcement (Martinez and Orams, 2009). Understanding tourist perceptions also helps to inform policy and management regarding participant choices and attitudes towards marine tourism activities.

Tourist attitudes and motivations

Tourist attitudes and motivation is an important component of any form of tourism and helps to reinforce travelers' expression of self. Environmental concern has been shown to be a strong predictor of consumer purchases including activities selected while on vacation (Mobley, Vagias and DeWard, 2010). What is common to all wildlife tourists is an affinity for the outdoors, one that mostly has been developed early in life. Bixler, Floyd and Hammitt (2002) validate this showing evidence for childhood exposure to nature as essential in influencing environmental leisure choices and recreation activities in the outdoors. Interestingly, this early exposure has little bearing on environmental activism, an argument often used to justify the positive effects of marine and other forms of wildlife tourism (Bixler et al. 2002). Lee (2011) demonstrates additional attributes that impact environmentally responsible behavior among tourists including place attachment, recreation involvement, and conservation commitment.

In 1976, a famous study developed by Kellert (1984) created nine orientations towards animals that reflect human attitudes and behaviors. These categories are helpful for exploring the many ways people perceive and deal with animals; however, they do not capture the blurred distinctions that exist within individuals, and across cultures. Studies like Kellert (1984), Lee (2011), Mobley et al. (2010) and Bixler et al. (2002) identify attributes that may influence environmental choices while travelling, but, do not take into consideration the effects that these 'ecotourism' choices have on the environment itself.

The human passion and interest towards dolphins, for example, are what drive many people to inadvertently exploit them through dolphin tourism.

Prideaux, McNamara and Thompson (2012) conducted surveys on rainforest visitors to identify the level of threat perceived while participating in forest tourism activities. Results showed that participants considered their influence to pose a moderate risk to the ecological integrity of the forest, highlighting the irony of their decision to participate in these activities (Prideaux et al. 2012). Another example specific to dolphin-swim encounters was demonstrated by Wiener, Needham, and Wilkinson (2009) when dolphin-swim tourists in Hawai'i verbalized extreme disappointment if they did not participate in up-close activities during wild dolphin encounter trips, even when operators said that it would not be in the best interests of the animals. Finkler and Higham (2004) identify this as 'the whale watchers paradox': the desire to get as close as possible to the animals, while recognizing at the same time that this may have a negative impact on the species. Finkler and Highams' (2004) study of whale watching tourists in the San Juan Islands verifies the dissonance people experience between wanting to protect cetaceans and a willingness to view them in a sometimes unhealthy environment. The question of how attitudes influence our behavior towards animals is a central theme in the research on human-animal interactions. The complexity of tourist attitudes and decision-making needs to be further addressed and cannot be simply compartmentalized into different boxes. Many people fit into more than one category and have varying ideas about and influences on individual commitment and stewardship to the natural world.

Visitor preference

Incentives for participation in activities are not static and wildlife tourists differ in their values, levels of specialization and desired wildlife experiences (Moscardo, 2000; Semeniuk, Haider, Beardmore and Rothley, 2009). Many factors contribute to enjoyment of the dolphin tourism experience. Cater and Cater (2007) emphasize individual identity; they explain that selection of recreation activities are used as ways of ‘distinguishing oneself from the “average tourist”’. This attempt to differentiate oneself justifies why the demand for off-the-track experiences with distinct species are highly sought after (Cater and Cater, 2007). Understanding visitor preferences and motivations in dolphin tourism is important to decision-making regarding permitted activities, and levels and types of interactions. By understanding choices that people make managers can better tailor their outreach to specific groups and anticipate user conflicts or capacity issues, and the wellbeing of the dolphins.

The framing of marine tourism is vital to the participants’ experience; even factors outside of the activity influence enjoyment, such as weather, sea sickness, crowding and the number of animals viewed (Newsome et al., 2005). Other aspects such as species selection also provide critical information regarding tourist preference. Newsome et al. (2005) explain that participants’ attraction is dependent on certain species attributes like intelligence, similarity to humans, aesthetic appeal, and ability to form attachments. Popular accounts of human bonding with dolphins are an important catalyst; advertising, mediated portrayals, and word of mouth help promote these experiences (Newsome et al.,

2005). Dolphin performance influences expectations based on the access to wild dolphins during an encounter and the proximity of the interaction. These interactions include the availability to make eye contact, getting within touching distance and physical exchange through patting, stroking or riding a dolphin (Knight, 2009).

The dolphin-swim experience

Sensual experiences of dolphin-swims

Cloke and Perkins (2005) use actor network theory to explore the mediation of dolphins in the development of tourism experiences. They emphasize the excitement associated with anticipation of first contact with a dolphin, the ability to collect photographic images, and the intimacy of direct interactions in dolphin-swim events (Cloke and Perkins, 2005). Other considerations not explored by Cloke and Perkins include feeling the aquatic environment and the equipment needed to swim in it. Swimmers require a snorkel and mask to be able to breathe and see underwater, and fins to hold pace with the dolphins. Entering the ocean requires the aid of technologies to keep up with what cetaceans do naturally, but how do these additions change the encounter (Merchant, 2011)? Merchant (2011) and Cater (2008) address this gap using sensual phenomenology by emphasizing the intricacies of tourists' lived experiences via the senses.

Even though Merchant (2011) does not directly address dolphin-swim tourism, her account of the lived ocean experience is applicable here. The unique feeling that occurs when swimming is an important piece of the wild dolphin-swim experience. Merchant

(2011) explores this body-landscape connection using affective engagements with the underwater world, allowing for investigation of this environment. More work is needed to explore the way dolphin-swim participants use the ocean and the sensuous encounters involved with cetacean interactions. Many dolphin-swim participants highlighted the physical importance of this event from physically touching a dolphin, looking directly into their eyes and feeling sonar across their body (Davis, 1997; Desmond, 1999; Ocean, 1997; Smolker, 2001; Taylor, 2003). These claims have yet to be documented and explored within an academic context, leaving a noticeable gap in the sensual phenomenology research associated with dolphin-swim interactions.

Swimming in a wet and foreign environment can be enough of a new experience on its own (Cater, 2008). Aside from the feeling of being in water, dolphin-swim participants emphasize the emotions felt following their interactions with dolphins (Lemieux, 2009). Common participant reactions include increased energy both during and following the swim, reports of becoming happier, feeling amplification of senses, later dreaming about dolphins and entering a contemplative or meditative state (Lemieux, 2009; Ocean, 1997). Swimmers note the importance of proximity in a dolphin-swim encounter including the availability to make eye contact, getting within touching distance and actual exchanges through patting, stroking, or riding a dolphin (Knight, 2009).

Dolphin eyes and the tourist gaze

Swimmers report a stronger emotional connection when they feel acknowledged by a participating dolphin. Making eye contact is considered to be one of the most profound

experiences for individuals in wild and captive dolphin-swims (Curtin, 2006). Addressing both the literal and metaphoric visual intake of dolphins during swim experiences, Urry's (1990) tourist gaze concept lends perspective on underlying consumptive behaviors. Urry (1990) accounts for pre-existing images, which he believes are deeply embedded into human culture, shaping expectations of what people anticipate from an encounter. Advertising of people frolicking, kissing, and playing with dolphins reinforce the public's desire to participate in these activities. The gaze itself divides into two forms requiring an experience of authenticity: the romantic (a personal relationship with the object of the gaze), and the collective (presence of a large number of other people engaged in the gaze); both of which are present in dolphin-swim tourism (Urry, 1990). Urry (1990) contemplates the tourist experience through an already existing frame created by representations found in media and elsewhere. Popular accounts of human bonding and attachment to wildlife have been important catalysts in dolphin-swim tourism, increasing specialization in the industry as more people become comfortable with the activity.

The tourist gaze not only applies to how the participant views dolphins, but in what way this interaction is visually captured. The photographic image during dolphin encounters is so important that it can actively construct the swimmer's perception of the event. For many, the gaze is not just between humans and dolphins, but humans and the camera as well (Berger, 1980; Urry, 1990). Tourists can become fixated on the objective of capturing photos, resulting in a loss of interest once the moment is captured on film (Smolker, 2001). In these situations, most people do not really engage in meeting with



Figure 7. An example of the ‘ideal moment’ targeted for photograph in a dolphin feeding experience (C.Wiener).

the dolphin, as they witness it from behind the camera (Cloke and Perkins, 2005; Smolker, 2001). As demonstrated in Figure 7, a photograph visually represents the ‘ideal moment’ in a dolphin interaction. Warkentin (2007) highlights pictures as key objects, serving as confirmation of participation to be shared with family and friends. Dolphin-swim companies play on this by offering to take photos or video so that the experience is guaranteed to be captured.

Scholars like Ryan (1997) and Urry (1990) have written a multitude of papers on the photographic construction of tourism; however, the question of how a dolphin can reciprocate the gaze during these pictured encounters is missing from the literature. More research needs to take into account the cognitive functioning of the dolphins themselves during human encounters. Unfortunately, cetacean behaviors are often misinterpreted because of false assumptions that dolphins are happy due to their upturned curve in the rostrum, or a twinkle in the eye (Desmond, 1999; Lemieux, 2009; Smolker, 2001). Some dolphin species are easily challenged by direct eye contact and perceive this behavior as threatening (Smolker, 2001).

How meaning is generated for a dolphin and a human differs greatly due to their individual environment, or *umwelt*. Deely (2001) sees the *umwelt* as a mechanism for humans to understand the individual experiences of other beings within a larger physical environment; however, the reading of animal signs is also blurred by human-centered viewpoints. When assigning meaning to animal behavior it is important to remember that individual interpretation of these signs can color the human perspective (Besio et al., 2008). Misinterpretation is common because it contradicts the desired human experience of mutual enjoyment from the exchange. Emphasis in the literature on dolphin-swim encounters often misses a critical piece of this relationship by ignoring the animal's experience. Human participants have no problem when they are responsible for the gaze direction, but feel uneasy without knowing how they are being observed. Derrida accounts this form of witnessing in his famous piece *The Animal That Therefore I Am* (translated by D. Wills, 2008).

Calarco comments on Derrida's observation of the visual relationship between humans and animals.

What Derrida is describing is not an encounter with the gaze of "an animal" (in general), but finding oneself being seen by the uncanny gaze of a particular animal, a cat, this little female cat that, even though it is domesticated and all too familiar, nonetheless retains the capacity for challenging that familiarity. (Calarco, 2008: 124)

Although Derrida references a domesticated cat, the same type of gazing occurs with human swimmers who have encountered eye contact with dolphins (Calarco, 2008). The involvement of both human and animal in an interaction is powerful, creating

vulnerability and expression for both participants (Calarco, 2008). Derrida discusses the literal and metaphorical nakedness he feels from his cat's gaze. The fact that humans are willing to emotionally and physically connect to a non-human subject is influenced by an engrained power dynamic, with less judgment and intimidation felt in the presence of animals. According to Derrida (2008), nudity in this sense is not of being literally naked, but exposing one's inner and true feelings to the world. This exposure is often recounted through eye contact with a dolphin. The dolphin stare in a swim experience is critical to the human-dolphin connection. White describes his feelings when a dolphin returns his gaze during a swim encounter.

What happened when that dolphin looked at me? The gaze stripped me of all presumption. But it was more, the dolphin "regarded" me. I have never seen such complexity, humor and recognition in the eyes of any creature other than humans, and rarely enough in those. Inside that sleek gray dolphin body was a person. No doubt about it: a self-aware, evaluating, conscious, thinking, playful and accepting person. (White 2003: 74)

The eyes of dolphins during these interactions are represented as important social cues used to infer mental states; however, just because there is an implied understanding of behavior does not mean the dolphins are ascribing the same meaning to their actions (Keeley, 2002).

Touch and connection

Every year, more than 50,000 people seek out touch experiences with dolphins, wanting to participate by using their tactile senses and bodies (Olmert, 2009). Cater and Cater (2007) attribute the desire to physically engage with dolphins to the fact that humans do

not connect directly with the natural world as much as they used to. The embodied experience of physically being in a dolphin's environment creates a close connection with nature, producing an emotional response in the participant (Besio et al., 2008). Ocean (1997) describes the physicality of her incident swimming with the dolphins:

A dolphin moved to my left and we swam eye to eye. This seemed very significant, as if a long-lasting friendship was being honored. Together we would bend and dive shallowly, roll and swim belly to belly, returning together at the surface. (78)

When humans swim with dolphins a bond is often felt by sharing the same environment. This intimacy has become an important part of the swim experience (Cloke and Perkins, 2005).

The need for contact



Figure 8. The need for physical contact is central to the dolphin-human interaction (S.Stanley).

Contact is an important part of dolphin tourism both in captive and wild settings, as demonstrated in Figure 8. The method in which marine mammal interactions take place affects the overall perspective of the experience. For example, the

viewpoint from a boat above the ocean will produce a different encounter from someone who is in a pool or watching from land. Cater and Cater (2007) reason that the need to get

‘up close and personal’ stems from a desire for connection. Humans can achieve a sense of control through the manipulation of wildlife by touching and feeding; although, this can become extremely dangerous when the animals lose interest. Newsome et al. (2005) document tourists trying to elicit responses by shouting, throwing objects, and chasing wildlife because the animals ignore them. Saltzer (2001) surveyed marine tourism participants and found more than 50% identify contact with animals as necessary for a positive experience. Another survey by Bulbeck (2005) suggests that visitors to wildlife encounter sites do not consider their interaction to count when animals ignore them; however, if physical contact is made then people are satisfied.

Sensory engagement is also important to cetaceans. Dolphins are very sensitive to touch and how they initiate contact. Cetaceans communicate with their bodies using flukes, pectoral fins, teeth, and rostrums to demonstrate pleasure, warning and affection (Dudzinski and Frohoff, 2008). Dolphin-swim participants may be communicating something unintentionally through their body language which could be misinterpreted by the dolphins. For example, the excitement and allure of the interaction can lead to an adrenaline rush in human swimmers, causing chasing behaviours. In order to emulate dolphins in their swimming conduct many companies encourage participants to use ‘dolphin position’, avoiding aggression or misinterpreted body language. Hands at the swimmer’s sides or clasped behind backs, legs kicking slowly with deep strokes, head in the water, breathing slowly and relaxed movement is the suggested method (Dudzinski and Frohoff, 2008).

Recommendations for further study and management

Those who partake in dolphin tourism are an interesting sub-set of marine tourists and may differ from other types of travelers in their frequency of involvement, knowledge level, and goals. This is an area requiring further exploration in the literature characterizing the behaviors and interests of dolphin tourism participants. Social science studies of human perceptions in dolphin tourism are a relatively recent area of study. More human dimensions work is needed in understanding the experiences people seek through wildlife viewing. Dolphin tourism is a complex and multidisciplinary area of study that requires analysis and cultural considerations. The meanings produced through the tourism experience are essential to understanding the role of wildlife in the social construction of nature. As perceptions change with time, it is these shifting opinions that help to explore the place of marine wildlife in modern society.

The context of personal experience is a pertinent theme to explore when considering human dolphin relationships. The importance of how space influences contact in dolphin-swims needs to be addressed using sensual phenomenology. Unfortunately, the majority of existing literature such as Lemieux (2009) and Ocean (1997) approaches these concepts through personal accounts and experiential recollections. Other themes of importance include determining the motivations behind wild dolphin tourism and the emotional gratification that participants receive. Issues pertaining to why people want to swim with dolphins, the conservation values produced and the attitudes of humans following dolphin-swim activities are all important areas requiring further research.

Scholars such as Ballantyne et al. (2007), Lück and Jiang (2007), Moscardo (2000), and Saltzer (2001) request more work on learning in wildlife tourism settings, emphasizing the influence of dolphin-swims on people's relationships with the natural world or actions towards marine conservation.

Understanding the dolphin tourism market is another source of information needed to make predictions about future expansion of operations and demands of potential tourists. The collection of primary economic and tourist demographic data is necessary, including the price and services offered by each operator and potential number of participants (Hu et al., 2009). Hu et al. (2009) emphasize the need for tourist data to facilitate demand analysis and determine the relationship between price and services in consumers' decisions to join excursions.

Further research looking at the effects of dolphin tourism on communities, tourists and dolphin populations is also needed, providing criteria for standardization of management regulations and economies. It is important to consider both biological and social sciences to develop an integrated analysis of the problems related to dolphin tourism. Additional study from in the water is also needed, as little is known about wild dolphin interfaces once tourists are submerged. Management requires guidance from research to understand how to mitigate both short and long-term effects, and to monitor rule implication and enforcement (Martinez and Orams, 2009). Unfortunately, most of the research has been insufficient, and demands for dolphin tourism is pushing the industry beyond the limits of

what the current data can justify (Bejder and Samuels, 2003). Table 1 summarizes the recommendations for further research extrapolated from the review of the literature.

Table 1: Summary of future social science research needs pertaining to dolphin tourism

1. Participant perceptions/ interactions of dolphins tourism in both captive and wild environments
2. Sensual phenomenology work related to dolphin-swim experiences
3. Economic and market analysis of emergent dolphin tourism regions
4. Perceptions of impacts associated with dolphin-swim activities and how to best manage these
5. Community-based perspectives and oral historical work in relation to dolphin tourism
6. Investigation of participant conservation attitudes and efforts developed from dolphin tourism
7. Integration of biological and social sciences across all marine tourism research
8. In-water examination of the relationships between humans and dolphins during interactions

Conclusion

Emphasis on human-dolphin relationships has driven the popularity of both wild and captive swims in the tourism sector. Studies of tourist perceptions and human relations in dolphin tourism are a relatively recent area of research. Much of the literature surrounding dolphin-swim tourism has been based on short-term, biological studies documenting the effects of human presence on dolphin behavior. This paper represents a collection of interdisciplinary research that has drawn on the human experience in these dolphin encounters. Over time, human interpretations of cetaceans have reflected shifts in dominant societal perceptions. Whether people view dolphins as an idealized being in the wild, or as a performer in a captive facility, it is ultimately the individual experience that develops unique constructions of the species. Presenting the existing literatures relating to dolphin tourism has hopefully allowed for a greater contextual framing of the human dimensions research including tourist perceptions and motivations, the global economic growth of dolphin tourism, and the sensory component of animal encounters. Dolphin-

swim tourism encapsulates a complicated and varied human response to animals and the range of relationships that people have with dolphins. This industry will likely not decrease but if critical examination of participants' behaviors towards dolphins continues then an attempt to improve protection and management can be made.

Chapter 4: Fins over feet: Commercial and community attitudes towards wild Hawaiian spinner dolphin-swim tourism

Preface

Fins over feet: Commercial and community attitudes towards wild Hawaiian spinner dolphin-swim tourism represents the first stage of this research investigating dolphin tourism in Hawai‘i and informs the work completed in Chapters 5 and 6. This chapter explores the socio-cultural complexities of the dolphin-swim industry through semi-structured interviews with commercial and community participants. Forty-seven interviews provide an assessment of the attitudes toward dolphin tourism and proposed management initiatives in two locations, Kailua-Kona, Hawai‘i Island and Wai‘anae, O‘ahu. Comparative analysis of the respondents shows significant differences between the two interview locations, which is a common theme amongst the other research completed. This chapter will center on community and commercial changes, community conflict, and regulation initiatives which is re-addressed in Chapter 5 using the same interview data, but from an economic perspective. This chapter has been submitted to the *Journal of Sustainable Tourism* for consideration. Co-authors Leesa Fawcett and Paul Wilkinson are committee members who provided copy editing for the manuscript. In the biological science field anyone who participated in a manuscript is included as a co-author.

Chapter Summary

The recent popularity of interactive marine mammal activities has led to the expansion of businesses that incorporate in-water “swimming” experiences. In Hawai‘i, growth in tourism focusing on wild Hawaiian spinner dolphins (*Stenella longirostris*) has occurred over the past thirty years, including a proliferation of swim-with activities. Concern about the sustainability of the wild spinner dolphin tourism has led to investigations of the population’s health, yet no one has examined the human dimensions of this problem. Government management agencies are in the process of developing plans to reduce exposure of resting spinner dolphins to human activity in the Hawaiian Islands. To better understand the socio-cultural complexities of this issue, semi-structured interviews were conducted with 47 commercial and community participants assessing attitudes toward dolphin tourism and proposed management initiatives. Nineteen themes were determined through internal and independent review of the transcripts and a content analysis was performed with moderate inter-coder reliability ($p=.75$). Comparative analysis of the commercial respondents showed statistically significant differences between the two interview locations in Kailua-Kona, Hawai‘i Island and Wai‘anae, O‘ahu pertaining to observed dolphin behavior during dolphin-swims and preferences for management. Discussion will center on community and commercial changes, human-dolphin connections, community conflict, and regulation initiatives.

1. Introduction

A significant growth in marine mammal tourism has resulted in dolphin businesses' enveloping communities, creating hot spots of marine mammal interactions (Cloke and Perkins, 2005). The accessibility of marine tourism operations has driven growth in dolphin commerce, and interest has spread so quickly that protective regulations have not been able to keep up. In particular, dolphin-swim tourism in the Hawaiian Islands has been partially responsible for redefining how some people think about and interact with their community. Subsequently, dolphin tourism in Hawai'i has transformed community areas into recreation-focused tourism hubs (Vaughan and Ardoin, 2013).

Previous tourism literature illustrates that human attitudes are influenced by perceptions of a place or activity, for example, many people visit Hawai'i with the preconceived notion that it is a place to engage with marine life (Urn and Crompton, 1990). Attitude is also used as a popular variable in determining behavior, however, other studies have shown that this is not always the case—attitudes do not necessarily determine behaviors (Ajzen, and Fishbein, 1980; Schiff, 1970). For the purposes of this paper attitudes will be considered as influenced by social perception and a function of previous experience, including knowledge (Schiff, 1970). As such, a focused examination of the differences between community and commercial resident's attitudes towards dolphin tourism on two different Hawaiian islands will be studied.

Perceptions engrained in larger cultural narratives influence human attitudes towards non-human animals (Fawcett, 2014; Fawcett, 2000; Oakley et al., 2010; Warkentin, 2009). In Hawai‘i, the importance of spinner dolphins varies for different segments of the local residents relating to economic, recreational, ritual, or social interests (Cristancho and Vining, 2004). As a result, the Hawaiian Islands are an excellent place to study commercial and community attitudes towards dolphins and related tourism. This paper identifies the socio-cultural contexts, conditions, and attitudes that affect dolphin-swim histories and relationships in Hawai‘i. We investigate the distinct attitudes held about Hawaiian spinner dolphin tourism and related management decisions amongst different stakeholder groups in two locations. These attitudes were investigated through the first comprehensive case study of commercial wild dolphin tourism in Hawai‘i using semi-structured interviews. Exploration of two main dolphin tourism communities including Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island will be shared and contrasted. Analyzing these values help to provide understanding of different stakeholder groups and demonstrate regional differences for consideration when establishing proposed spinner dolphin regulations.

1.1 Hawaiian spinner dolphin tourism

Several sandy bays along Hawaiian coastlines provide resting habitat for the Hawaiian spinner dolphin (*Stenella longirostris*). These geologic features create accessible and reliable opportunities for dolphin-human interaction. Hawaiian spinner dolphins differ from most other dolphin species as they hunt cooperatively at night and rest during the

day (Lammers, 2004; Tyne, Pollock, Johnston, and Bejder, 2014). During these critical resting periods, spinner dolphins are most heavily disturbed by tourist vessels and swimmers looking to interact with them (Heenehan et al., 2015; Tyne et al., 2014). Concerns that boating and swimming activities directed at dolphins may have population effects (such as habitat movements and shifting energy budgets) have been documented, as the popularity of, and interest in, dolphin-human interactions continues to grow (Courbis and Timmel, 2009; Delfour, 2007; Danil, Maldini, and Marten, 2005; Tyne et al., 2014).

Since being enacted in 1972, the Marine Mammal Protection Act has forbidden any indirect provocation (“Level B harassment”) of marine mammals in United States waters. Presently, a large group of public sector managers and advocates feel that dolphin-swim tourism is violating this policy; however, it is both difficult to demonstrate harassment and enforce. In December 2005, the advance notice of proposed rule changes pertaining to dolphin-swim tourism was released by the National Oceanic Atmospheric Administration (NOAA), but, as of 2016 new regulations have still not been established.

2. Methods

Semi-structured interviews were selected to provide an integrative and holistic method of approach. Interviews enable a deep analysis of dolphin-swim groups, offering validity for the language and practices shared (Gee, 1999). The interviews discussed in this paper are part of a larger research project examining spinner dolphin-swim interactions in Hawai‘i.

The analysis of the interviews allows for a more in-depth understanding of the community, while other methods³ (semi-structured survey, participant observation, and video analysis) help illuminate the experiences and perspectives of dolphin-swim tourism participants and their related behaviors.

2.1 Sampling and data collection

Semi-structured interviews (Gillham, 2005) were conducted with individuals to: a) assess attitudes toward dolphin tourism and the proposed management initiatives; and b) gather a historical perspective on the resident dolphin population. Two sets of interview questions were composed for the commercial and community groups identified. Thirty two interview questions were divided into three general themes: the dolphin-swim experience, local residents' relations, and attitudes towards proposed management (a full list of interview questions are shared in Appendix B). Participants were selected using voluntary response sampling solicited through a community meeting where people were asked to leave their contact information if they were interested in being interviewed. Additionally, purposive and snowball sampling was used by asking interviewees for recommendations and through cold calls to all dolphin-swim company owners. Extensive pre-testing of the interview questions was conducted including 17 pretest subjects, resulting in two sets of revisions. Questions during the pre-test were reviewed to ensure that they were fully understood, concise, and not culturally or politically insensitive. The largest changes were made to the question order and details about operator revenues.

³ Not reported here.

Interview protocols adhered to the standards of the Canadian Tri-Council Research Ethics guidelines, and received ethical approval from York University Human Participants Research Committee.

Previous literature recommends a sample size of 30 or larger for in-depth studies (Gillham, 2005); a total of 47 participants were interviewed over eleven months from April 2012 to February, 2013, including 26 from the commercial and 21 from the community categories (Gillham, 2005) (see Table 2). The community group interviews in Wai‘anae were comparatively smaller due to the fact that there were very few resident swimmers and vocal community members available for interview. Almost double the amount of males were interviewed compared to females, reflecting a gender imbalance in company owner, operators and captains. Interviews were conducted individually, digitally recorded, and later transcribed verbatim. Cooperative inquiry was included in transcription, allowing interviewees a final opportunity to confirm or re-clarify recorded notes (Hycner, 1985). Efforts to ensure rigor in the data were made, including prolonged engagement with communities; however, coding of themes should still be considered interpretive (Braun and Clarke, 2006). This study does not represent the general population of Hawai‘i, but a sample of dolphin-swim respondents. For this reason, generalization and interpretation of these finding should be made carefully.

Table 2. Commercial and community interview respondents ($n=47$).

	<i>Freq.</i>	<i>Percent</i>
<i>Gender</i>		
Male	29	62%
Female	18	38%
<i>Affiliation</i>		
Commercial	26	55%
Captains/operators	6	23%
Guides	4	15%
Company owners	7	27%
Owners who also captain	9	35%
Community	21	45%
Resident swimmers	12	57%
Community affected by swims	7	33%
Fishermen/women (subsistence)	2	10%
Native Hawaiian*	7	15%
<i>Location</i>		
Wai‘anae, O‘ahu	32	68%
Kailua-Kona, Hawai‘i Island	15	32%

Note. Categories were self-identified. *not mutually exclusive to commercial or community category.

2.2 Data analysis

Coding themes were not predetermined and emerged from a combination of source data and personal experience through boat-based field observations. Using methods described by Boeije (2002), Braun and Clarke (2006), and Knight, Nunkoosing, Vrij, and Cherryman (2003) interpretation of interview text was completed through a two-part process: 1) fragmenting the data to code and identify categories; and 2) using the identified codes to construct a content analysis of themes included in the interview response data set. The content analysis was performed with 19 codes that were determined through common words or statements identified during the review of the

interview transcripts (Boeije, 2002). Quotes were also selected to highlight examples found in the interview transcriptions. Three independent student-volunteer coders helped to develop and code interview responses to control for validity and replication in the coding (Braun and Clarke, 2006; Hycner, 1985).

The statistical package SPSS (version 21.0) was used to complete descriptive statistics and inter-coder reliability using Krippendorff's alpha (α) ($p=.75$). Krippendorff's alpha was selected because it can be used with multiple coders, and can account for ordinal, interval and ratio level variables (Hayes and Krippendorff, 2007; Hallgren 2012). Reliability using this test is assumed at a minimum of $\alpha = .67$, which takes into account expected and observed disagreement (Krippendorff, 2011). In addition to content codes, Fisher's exact test was implemented to test for significance in responses to questions (discussed in results). When the sample size categories are less than five a Fishers exact test is recommended over Chi Square (McDonald, 2014).

2.3 Site profiles

Interviews took place at two sites: Wai'anae, O'ahu and Kailua-Kona, Hawai'i Island. These locations were selected because they are hubs for wild Hawaiian spinner dolphin-swim tourism and also have shore-based, non-commercial dolphin-swims (see Figure 10). Kailua-Kona encompasses a broad area with shallow bays both to the south and the north creating a spread-out, linear tourism model. The majority of commercial dolphin-swim operations occur in the north with some visits to the south, while the bays further south provide access where people can swim directly from shore without the use of a

commercial operation. There are more commercial operations and accessible bays in Kailua-Kona compared to Wai‘anae, this may be because of the distance from the main tourist hub (Waikīkī) on O‘ahu.

3. Results

3.1 Dolphin tourism discussion themes

A total of 34 topics were identified from the interviews ($n=47$); 19 of the most frequent topics based on coding are presented in Table 3 along with topic means and reliability scores. Ratio variables were used during coding, which makes it more difficult for coders to come to the exact same results, this is reflected in the scores below (De Swert, 2012). The topics that had low agreement were more subjective, such as the notion of balancing human and dolphin needs ($\alpha=0.569$), swimmer expectations ($\alpha=0.506$), and cooperation between operators ($\alpha=0.491$). Strong agreement was found on expected topics central to interview discussions, including the need for more management ($\alpha=0.94$), and dolphins as a financial resource for the community ($\alpha=0.922$). Central themes aided in the breakdown of discussion pertaining to spinner dolphin population and behavior, dolphin-swim community and commercial changes, human-dolphin connections, and dolphin tourism management. These themes are discussed in greater detail below.

Table 3. Interview themes identified by coding frequency and agreement.

Theme	Mean	Kalpha α
Need for increased conservation management/regulation.	7.67	0.94**
Dolphins as a financial resource.	3.67	0.922**
Dolphins ability to heal.	32.67	0.892**
Dolphin habituation.	8.67	0.885**
Noise as a disturbance to dolphins.	7.67	0.862**
People fulfilling a dream by swimming with dolphins.	5.67	0.86**
Operators being hostile/removed from community.	5.00	0.839**
People recognizing/naming individual dolphins.	32.67	0.808**
Dolphins deserve respect.	29.00	0.772*
Too many boats, swimmers, snorkelers, etc. (or too large of boats).	14.33	0.742*
Lack of enforcement/no enforcement of regulation.	38.67	0.742*
Let dolphins approach you/don't chase them (for better experience).	24.00	0.727*
Dolphin interaction being a life-changing experience.	17.67	0.716*
Dolphin intelligence/ behavior (ability to make informed choices.)	92.00	0.701*
Dolphins ability to perceive, feel and communicate with humans (sentience).	50.67	0.602
Need for greater public education about dolphins.	32.67	0.58
Balancing dolphin and human needs.	5.33	0.569
Unrealistic expectations from swimmers about dolphin interaction.	13.00	0.506
Little cooperation between operators.	14.33	0.491

Note. Calculated in SPSS 21.0 with Krippendorff Macro by Hayes and Krippendorff (2007). *Weak to moderate intercoder reliability (0.67 – 0.79); ** Strong intercoder reliability (0.80+)

3.2 Community versus commercial groups

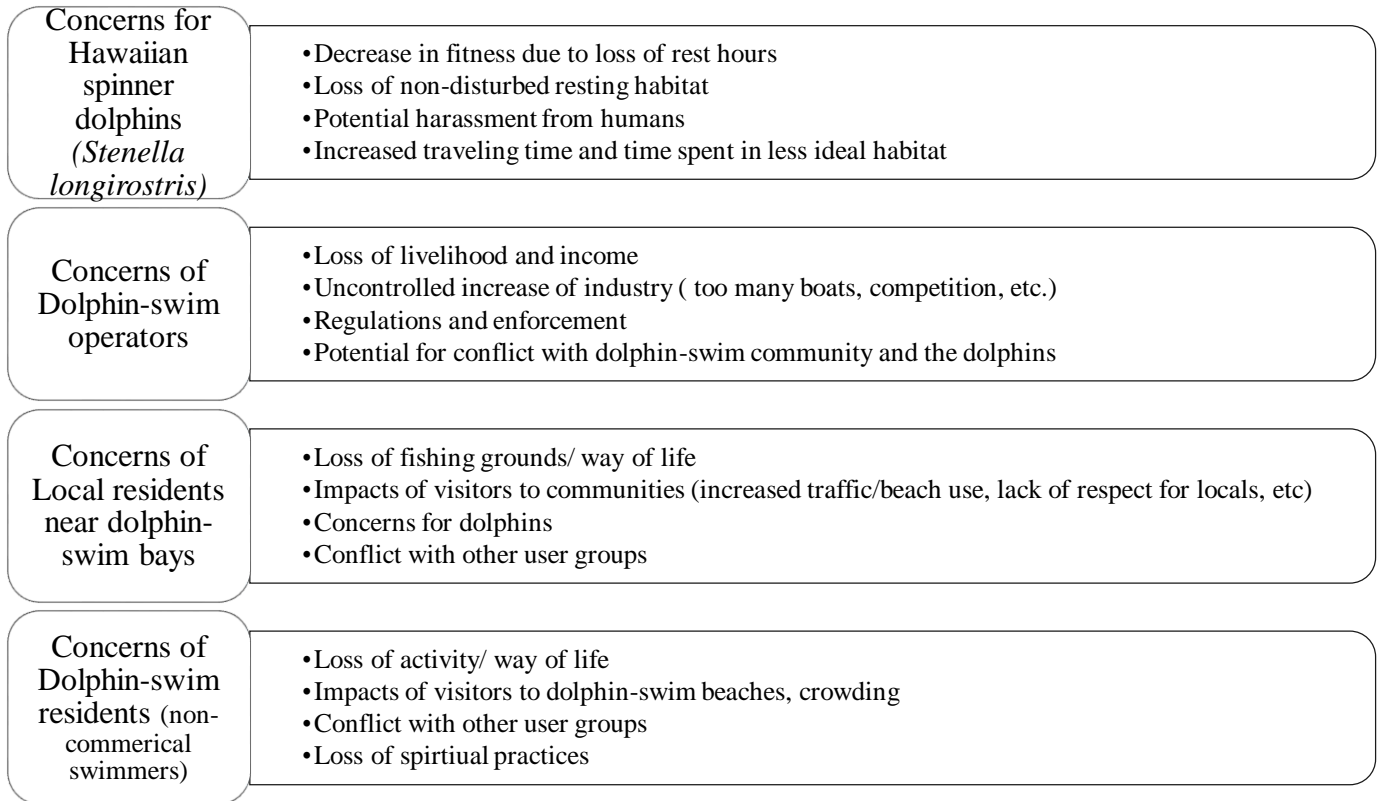


Figure 9. Dolphin-swim communities and associated concerns.

A wide variety of individuals are influenced by spinner dolphin tourism in Hawai‘i and some competing interests have created conflict (see Figure 9). The most active group are the commercial dolphin tour owners whose livelihoods depend on their dolphin businesses. This extends to the captains and guides who are employed by these companies, and the related establishments that profit from dolphin tourism, such as the nearby restaurants and hotels. Those wanting to swim with the dolphins are considered another user group, including both tourists and local residents who swim with dolphins on a frequent basis. Individuals living adjacent to the dolphin-swim activities are also

impacted by increased traffic and use that causes conflict between other ocean users including *akule* (big-eyed scad) fishers and other long-time residents. Lastly, the state and federal managers who are trying to implement policy to protect the spinner dolphins conflict with the resident swimmers and dolphin tourism operators.

The Kailua-Kona and Wai‘anae interview locations differed in their commercial and community connections to the spinner dolphins. Kailua-Kona residents were typically more involved with the spinner dolphins and the bays where activities take place and the commercial groups in Kailua-Kona have been offering dolphin-swims for longer. Kailua-Kona interviewees (community and commercial) spent an average of 17.69 years (SD=11.58) interacting with dolphins, while the Wai‘anae interviewees (community and commercial) spent an average of 13.33 years (SD =9.41). Length of time spent with the dolphins was not statistically significant; however, it is worth noting that time differences were also seen between community and commercial respondents. Commercial participants spent an average of 13.5 years (SD =8.28) swimming with dolphins, while community members spent substantially longer, with an average of 19.76 years (SD =13.08). Resident swimmers invested the longest time alongside of the dolphins, with 17% (n=8) swimming for 20 years or longer. Overall, participants spent an average of 16.30 years (SD =11.02) with dolphins, demonstrating a long-time investment and relationship.

Comparative analysis of the commercial and community respondents on different islands were completed using Fisher’s exact test ($p<0.05$) (see Table 4). There were community

differences between Kailua-Kona and Wai‘anae; however, these could not be properly compared as only a few residents on Wai‘anae were included in the interviews. Several large dolphin-swim communities live by the bays on Hawai‘i Island compared to very few dolphin-swim residents on O‘ahu. Results indicated significant differences between the commercial Kailua-Kona and Wai‘anae respondents. This may be attributed to the discrepancies in boat operations, dolphin behavior, and operator preferences for management as discussed below.

Table 4a. Significant difference in themes between commercial and community groups.

Themes	Commercial (n=26)			Community (n=21)			Fishers p
	Yes	No	NR	Yes	No	NR	
Changes observed to dolphin population	14	9	3	9	11	1	.340
Changes observed to dolphin behavior	8	16	2	4	13	4	.050*
Changes to the dolphin-swim industry	23	1	2	19	1	1	.581
Changes to the dolphin-swim tourists	21	3	2	15	5	1	.528
Knowledge of dolphins role in Hawaiian culture	2	24	0	8	13	0	.028*
Current regulations not effective	24	1	1	21	0	0	.495

Note. NR = no response. Fisher’s exact test (2-sided) was used in place of χ^2 because cell counts contained less than five degrees of freedom. * $p < .05$.

Table 4b. Significant difference in themes between commercial groups by island.

Themes	Commercial Wai‘anae (n=14)			Commercial Kailua-Kona (n=12)			Fishers p
	Yes	No	NR	Yes	No	NR	
Changes observed to dolphin population	10	3	1	5	7	0	<.001**
Changes observed to dolphin behavior	12	2	0	0	10	2	<.001**
Changes to the dolphin-swim industry	14	0	0	9	1	2	.583
Changes to the dolphin-swim tourists	12	2	0	9	1	2	.751
Knowledge of dolphins role in Hawaiian culture	0	14	0	2	10	0	.094
Current regulations not effective	12	1	1	11	1	0	.235
Preference for government management	2	8	4	1	7	4	.012*
Preference for time/area dolphin habitat closures	7	7	0	1	10	1	.012*

Note. NR = no response. Fisher’s exact test (2-sided) was used in place of χ^2 because cell counts contained less than five degrees of freedom. * $p < .05$. ** $p < .01$.

3.3 Hawaiian spinner dolphin population and behavior

Estimates for the total Hawaiian spinner population were once predicted to be around 3,351 (Barlow, 2006); however, recent abundance studies have shown that the population may be fewer, but no exact counts have been conducted (Tyne et al., 2014). Distinct behavior and population estimates were found between Kailua-Kona and Wai‘anae locations. According to interviewees, the Kailua-Kona dolphins can be split into four pods that display unique behaviors; estimates for the total population ranged between 440-680 dolphins (see Table 5). This range overlaps with the recent population estimate for a Hawai‘i Island mark-recapture study on the spinner dolphins, estimating abundance to be between 524-761 dolphins with 95% confidence (Tyne et al., 2014). The similarity in these estimates illustrates the utility of local resident knowledge and supports both estimates. While respondents had similar population estimates, general observations of the population were different. According to 42.6% ($n=20$) of participants, there were no observable changes to the spinner dolphin population, and those that did note fluctuations were split on whether the dolphins had increased 25.5% ($n=12$) or decreased 21.3% ($n=10$). Significant differences were seen between Wai‘anae and Kailua-Kona commercial respondents ($p<0.001$). Commercial respondents in Kailua-Kona did not observe population changes, whereas Wai‘anae commercial respondents saw decreases to the dolphin population. Overall, respondents observed more dolphins in Kailua-Kona than along the Wai‘anae coast. This does correspond with likely population estimates for both locations.

Further distinctions were also observed with the Kailua-Kona dolphin pods and home ranges. Respondents who swam with dolphins in the southern bays held different opinions about dolphin movements and behaviors compared to the commercial respondents who worked predominantly in the north. Respondents also agreed that a varying level of interactivity with swimmers among the spinner dolphin groups was dependent on location. Spinner dolphins in the southern bays on the Kailua-Kona coast were perceived to be more habituated to humans than northern pods. The south receives less dolphin-swim boat traffic, but there are more shore-based swimmers that have been using the southern shoreline for longer. Although behavior differences were noted for the varying locations, Hawaiian spinner dolphins do exhibit fission-fusion population tendencies, which means that the dolphins mix between pods (Andrews et al., 2010). Three of the interviewed operators noted that on occasion both the southern and northern pods mixed creating a super pod of up to 600 dolphins.

Table 5. Kailua-Kona coast spinner dolphin population and behavior estimates.

Location	Pod Size	Behavior	Level of Interactivity
Northern Pod	200-400	Dependent from day to day	Low
Honokahau Harbor	80-120	Do not care to swim with people	Low-Med
Ali'i Dr/ Kailua Pier	Around 80	"Friendly" group	Med-High
South bay (Kealakekua, Hōnaunau, Ho'okena)	Around 80	"Friendliest" group, are the most familiar with people	High

The Hawaiian spinner dolphin population displays predictable behaviors, such as resting daily in sand-bays and foraging off-shore at night (Lammers, 2004). Pods on different islands have exhibited minor behavioral distinctions based on some variation of resting times (Lammers, 2004). Among the interviewees, 25.5% ($n=12$) reported that they had

observed behavior changes in resident spinners. This was surprisingly low given the strong opinions held by those who did believe that they had observed change. Again, the commercial respondents in Kailua-Kona did not observe behavioral shifts, but Wai‘anae operators saw significantly more habitat alteration and decreases to the dolphin population ($p<0.001$). Described behavior changes included shifts in resting habitat 14.9% ($n=7$) and an increased comfort with boats and people 4.3% ($n=2$). Frequent observations included additional movement among the dolphins compared to previous years where they would stay more consistently in the shallow bays.

A number of community swimmers commented on the habituation of the dolphins, such as this person who said, “The swims have gotten better in the past six years, as the dolphins have become more curious about people, and an increase of interactions has occurred.” One dolphin-swim company owner in Kailua-Kona noted:

I have had various types of interactions with the dolphins over the last 15 years. They are more comfortable with humans now, compared to 25 years ago when they were shot by fisherman for sport. The dolphins have become friendlier and seek out playful interactions with humans.

Respondents expressed concerns regarding the dolphins’ habitat due to noise disturbance from the boats and increased habituation to vessels and swimmers in the water. Commercial respondents did share some concern about the increase in dolphin-swim companies influencing the dolphin population and behaviors, but, this was expressed as a required balancing act between dolphin and human needs. Gaining insight into local resident observations of dolphin behavior and population is important in assessing historical changes to the pods as dolphin-swim tourism increases.

4. Discussion

4.1 Dolphin-swim community and commercial changes

Community and commercial respondents discussed the increasing popularity of Hawai‘i as a destination for dolphin-swims; 89.4% ($n=42$) felt that there was growth in businesses offering this activity over the past fifteen years. Several dolphin-swim company owners expressed frustration with other marine tour businesses, such as recreation fishing charters and scuba companies who began offering dolphin-swims after the market reached “saturation”. Concerns regarding dolphin company growth were reflected in both the commercial and community interviews. The majority of respondents felt there were too many boats and swimmers in the water with the dolphins and that the boats in Wai‘anae were too large.

One of the main issues discussed in conjunction with increasing competition was the dissolving of “unspoken regulations” or “gentlemen’s agreements” among founding companies. Operators complained of too many new businesses bringing on young or inexperienced captains who did not know the protocols. One respondent cautioned, “The dolphin-swim bays can get dangerous, a company accidentally left two people behind.” Another respondent commented on the shift away from businesses helping each other in finding the dolphins, leading to increased competition and aggressive boat driving. Other commercial interviewees shared that the competitive shift had led to boats piggy-backing off other businesses that are good at finding the dolphins. Although there were many comments about problems among the operators, 76.9% ($n=20$) felt they had positive

interactions with other captains, demonstrating that only a small group of operators are causing issues.

The surge in dolphin-swim residents and growing use of the bays illustrates the demand for dolphin-swims and increasing competition among operators. Increased access to technology has resulted in tourists' use of online review sites and travel blogs, putting pressure on captains to produce positive encounters. Swim-with-dolphin experiences are marketed in a way that changes people's expectations of how close they can get to a dolphin (Wiener, 2015). Many of the excursions are booked by timeshare agents and activity desks who sell people on outings, frequently offering false promises. Several interviewees complained of this, "Often when tours are booked by the activity desks people don't even know they are going on a boat, they think they are going to do a captive swim."

Dolphin-viewing companies that do not offer swims encountered problems with participants who thought that they were going to swim in the water. As one respondent complained,

We experience pressure from people who do not understand why they cannot go in the water with dolphins. This problem did not happen ten years ago. Now there are more options because other companies do it, it is frustrating to see that kind of behavior rewarded. Five years ago, it used to be good enough just to see them, now with the internet and mass advertising, people have expectations.

Some commercial respondent's commented on the fact that they had not changed their practices, but the demographics of the clientele had altered the mindset of expectations. Several guides described a change in tourists, noting that the dolphin-swims used to be

more spiritually oriented with a smaller subset of swimmers. Respondents continued to reinforce the fact that people had unrealistic expectations based on what they saw on television or in captive programs. Approximately one third 30% ($n=13$) of those interviewed felt that tourist expectations were idealistic and unrealistic.

4.2 Human-dolphin connections

Greater moral consideration is attributed to species like dolphins based on the presence of qualities like intelligence and demonstrated emotions (Bekoff, 2002; Frohoff and Peterson, 2003; Kellert, Lavigne, and Scheffer, 1998). Interviewees expressed similar values in their justification of interactions with the spinner dolphins. Respondents repeatedly spoke of wild Hawaiian spinner dolphins “person-like” qualities referencing their ability to make informed choices ($n=92$) and demonstrate unique personality ($n=50$) through games, mimicry, and established rule-following during group interactions. The participants who frequently swam with the dolphins were the most adamant about assigning individuality and intelligence. One swimmer highlighted her belief in the dolphins’ intelligence, “Dolphins recognize regulars, they are self-aware and know distinct things. I have seen them checking themselves out in the video cameras.”

Commercial and community members who swam with dolphins provided stories where they witnessed obvious initiation of encounters by individual dolphins. One swimmer recalled, “I do not come out and ask for interactions, it is like being invited into their living room, you wait for the invite.” Another swimmer told a story about a 92 year old snorkeler who was sought out by a large pod of dolphins: “The way the dolphins

interacted with her, there was definitely more going on from the dolphin's side. The dolphins seem to target specific people; they have a lot of interest in children and pregnant women." This was not a unique statement; respondents often pointed out that pregnant women, children, and those who were open to a spiritual experience held the dolphins' attention. Respondents equated interactions to the dolphins' moods, suggesting that day-to-day differences were a result of energy levels and that dolphin choice was a key element during encounters. One swimmer explained that "you have moments when you know they (the dolphins) are seeking you out and want to be with you, you become one with them." Seventeen of the dolphin swimmers also believed that the dolphins possessed the ability to sense what each individual person needed through telepathy.

Swim participants agreed that the dolphins were intelligent enough to recognize boats and swimmers, citing stories of dolphins' selecting the same people day after day. Several swimmers shared that it took months of going out and wading before the dolphins would include them. The swimmers and commercial operators felt that they held a reciprocal connection with the dolphins; 64% ($n=30$) believed that the dolphins could recognize specific boats or people, and 70% ($n=33$) said that they could identify individual dolphins. During interviews, specific dolphins were repeatedly acknowledged by different respondents as having special bonds. "Star" and "Nacho" are dolphins in Kailua-Kona with distinguishing marks who were referenced as favorites. This brought up the question that if multiple interviewees felt these special bonds, was it because these particular dolphins were easily recognizable?



Figure 10. A pod of spinner dolphins playing “leaf game” with community members. Image credit C. Wiener.

Community swimmers felt that in order for the dolphins to allow people to join them in their games, they needed to get to know and recognize the person. One of the interspecies interactions regularly practiced by both dolphins and swimmers is a tag-like activity with a leaf that has established rules and learned behaviors (see Figure 10). The game is not known by dolphins or swimmers

on O‘ahu and is unique to specific locations on Hawai‘i Island. One community member explains:

Leaf game is when we take out leaves that we drop for the dolphins when we swim. They bring them back and wait for a response. If you try to pick up the leaf, they sometimes will rush in front of you and pick the leaf up. They are very playful, this game is a clear demonstration of their intelligence and interest.

The “leaf game” offers a connection creating a bond to show who is a familiar dolphin-swim participant among groups of visitors not often privy to these interactions. “Leaf game” was one of the main factors contributing to the community belief in the dolphins’ ability to make informed choices.

The community interviewees were not the only respondents who felt a bond with the dolphin pods. Boat captains and company owners within the commercial group also discussed personal relationships with the dolphins outside of their business. One captain said that he could name up to 80 dolphins. Several others spoke about a sympathetic

relationship, helping dolphins with fishing line or plastic bag removal when needed. One operator recounted rescuing a dolphin, “once we saw a dolphin entangled in line, so we brought the dolphin by the boat to remove it, the dolphin just stopped moving and let us do what we needed to do, we were able to save it.”

Commercial respondents showed great concern for the dolphins who they worked with; however, only 28% ($n=13$) of the dolphin-swim companies participated in any type of related conservation. Several respondents did express some concern as to whether their activities impacted the resident dolphin population: “One day I was driving the boat and I suddenly started apologizing as I am the one who brought people here to swim with the dolphins, I felt responsible.” For the most part, commercial respondents were witnessed enforcing guidelines for their swimmers to try to protect the dolphins. These protocols were frequently raised during interviews; respondents talked about preventing swimmers from chasing dolphins, not only for people’s protection, but also because it made for a better experience. Commercial respondents felt that this action alone was their contribution to dolphin conservation.

Commercial respondents were proud of the way they conducted business, providing a unique opportunity for their clients. During interviews, several captains shared that they were offering life changing experiences and fulfilling people’s dreams.

When someone finishes a dolphin-swim, they say things like “Wow that was the best day of my whole life, that was the most unbelievable experience”, or “I’m so overwhelmed and touched that I was brought to tears.” For some people it is a real magical and changing thing.

Respondents provided varied answers regarding what made the experience life-changing. Some interviewees, 21.3% ($n=9$), felt that it was enough just to see the dolphins in the wild, where as 19.1% ($n=9$) said that participants needed to be in the water with the dolphins, and 12.8% ($n=6$) felt that this could only occur when the dolphins directly engaged with a swimmer. Commercial respondents shared that participants often got disappointed if the dolphins swam too deep or did their own thing.

Community respondents who regularly swam with the dolphins pointed to a reciprocal learning that took place, resulting in swimmers trying to emulate dolphin “virtues.” One swimmer explained, “I was impressed at the wealth of changes the dolphins were bringing into human’s lives – people wanting to be in nature, becoming less materialistic, and being part of a community.” This embodiment of “pod-life” within the dolphin-swim community has led some on a spiritual path. Of those interviewed, 23.4% ($n=11$) said that their first swim served as an “awakening” and from then on they were “hooked.” Other swimmers, 8.5% ($n=4$), mentioned having visions of dolphins before or after swims, or that dolphins were connecting with them in their dreams. One swimmer called to mind a particular incident: “I wiggled my fingers in the water, the dolphin came over and we gazed into each other’s eyes. All of the sudden it hit me, I had dreamed of this dolphin.” Spiritual encounters like these have led to the development of groups that believe dolphins offer healing for those who need it (Ocean, 1997; Taylor, 2003).

A number of commercial respondents have capitalized on this belief. On Hawai‘i Island, there are several groups offering healing retreats and spiritual journeys with Hawaiian

spinner dolphins. Some interviewees testified to feelings of change after swims, which has also been described elsewhere (Cochrane and Callen, 1992; Taylor, 2003); this included alleviation of chronic depression, removal of pain, and recovery from illness. Some swimmers from the community group felt that the dolphins were able to heal people using telekinesis and echolocation, while others credited an increase in endorphins from swimming with dolphins. During interviews, several accounts of human-dolphin telekinesis were mentioned, such as, “Randomly I have heard voices when swimming, one time I had a dolphin next to me and then heard a voice saying go left and the dolphin would go left.” There were respondents who claimed that they themselves hold healing abilities while working with the dolphins; one swimmer spoke about her talent.

The dolphins and I communicate with each other as one. I give healing to others because the dolphins give so much to me. I go in with the mindset of pure love and whatever healing I can assist with, I send out.

Dolphin midwives and pregnant women are another group seeking assistance from the dolphins. According to two respondents, approximately five women seek out the dolphins every year to assist with water births. Those ‘dolphin birth’ participants follow previous dolphin water birth founders, Elena Tonetti and Igor Charkovsky (Newman, 2003). Tonetti and Charkovsky have since stopped their dolphin birth practice, but, there are some who continue this tradition.

Birthing and swimming with dolphins has been a contentious topic, particularly with the Kona communities who live close to the bays where these activities take place. Dolphin-swim groups residing in these bays have formulated a way of life around swimming with the dolphins, but, there are other residents who feel that these activities pose a threat to

the population's ability to rest and thrive. The majority of people take issue with those participating in dolphin interactions. Residents near these bays seem to be divided in their support of dolphin-human swims, with 29.8% ($n=7$) of community respondents expressing concern over conflicting activities.

4.3 Native Hawaiian dolphin connections

In Native Hawaiian culture, references to whales can be found; however, relatively few written descriptions, *oluellos* (Hawaiian proverbs), or oral histories alluding to *nai'a* (dolphins) exist (Cressey, 2009). Some people hypothesize that dolphins lacked importance to Hawaiians because they were not considered an edible species; others believe that dolphins did not arrive in Hawai'i until recent times (Cressey, 2009; NOAA, 2007). This is illustrated by the significant differences in stakeholder awareness of dolphins in Hawaiian history ($p=0.028$), demonstrating a gap in knowledge between commercial and community groups. Of the commercial respondents, only 4.3% ($n=2$) had some understanding of the dolphins' roles in Hawaiian culture. Counter to this, dolphins are mentioned in the *Kumulipo*, the Hawaiian story of creation and an oral genealogy that describes the birth of the islands and Native Hawaiian people. Dolphins are cited as following the first fish being born: "*Hānau ka I'a, hānau ka Nai'a I kekai lā holo*" (Queen Lili'uokalani, 1978). This translates to, "Born is the *I'a* (fish), born the *Nai'a* (dolphin) swimming into the ocean of the sun" (Queen Lili'uokalani, 1978). Other stories allude to dolphins assisting fishers and warriors with navigation or bringing back wounded or deceased bodies during war time (Cressey, 2009; NOAA, 2007).

Native Hawaiian culture has a profound history related to the ocean and draws upon many connections to marine resources (Friedlander, Shackeroff, and Kittinger, 2013). Relationships with marine species run deep and families consider specific animals as *amakua* (“family guardians”) (Cressey, 2009). A small minority of Native Hawaiians claim that the Hawaiian spinner dolphin is their *amakua* and they are from families that have healed with dolphins for many generations, making it okay to swim with them. Other Native Hawaiian community interviewees were not in favor of dolphin-swim activities as they feel it disrespects the primary use of the ocean for food and culture, and argue that dolphins are not a traditional animal to have as *amakua*. Some respondents were concerned with a lack of respect for the ocean and claimed that dolphin-swims were counter-intuitive to their way of life.

Swimming with dolphins is not the Hawaiian way, it is self-serving and indulgent. Native Hawaiians don’t swim with the dolphins, their parents and grandparents forbid them. The way Hawaiians deal with the ocean is different, the ocean is sacred, it is seen as our refrigerator, our protein source, not to be used for recreation.

Others articulated the fact that dolphins were not important, e.g., “I started fishing with my dad in 1963, we would see the dolphins, but did not pay attention to them. Hawaiians had one purpose – fishing, the wind has more meaning than dolphins.” Most of the Hawaiian community who objected to swimming with dolphins were not only concerned for the dolphins’ safety, but also had deep fears of being displaced by increasing numbers of tourists in the area. One respondent in Kailua-Kona said that this had already happened in one of the bays that used to be predominantly Native Hawaiian. “We have already been displaced from Nāpo‘opo‘o (Kealakekua Bay), which had a resident community that

was 90% Hawaiian. Since the dolphin-swims it is now decreased to 50%, this is also happening at Hōnaunau and Ho‘okena.” This attitude has led to several incidents with nasty messages left on car windshields, people singing angry songs about dolphin swimmers, and the spread of bad feelings in the community.

Another source of tension was reported between fishers and dolphin-swim tour operators. Dolphin-swims occur in shallow water, which is problematic as it is also the preferred habitat of several fish species. Fishers catching *akule* use the same areas where dolphins rest, leading to conflict with the dolphin swimmers and tour boats. *Akule*, for example, are found in shallower depths and are sensitive to noise produced by tour boat engines. This makes it challenging for the fishers trying to track down fish, but also adds increased risk of swimmer injury from fishing in busy tour areas. There has been little to no *akule* in some bays for many years and the fishers partially blame the dolphin-swim companies, their boats, and swimmers.

Each Hawaiian bay where dolphins reside is different, yet similar conflicts exist. Dolphin swimmers are not welcomed by the majority of Hawaiian residents, because it is viewed as disrespectful to enter bays without asking permission. Growing kayak and stand-up paddle board rentals for dolphin encounters, advertisements in tour books, and driving tours to bays are expanding the range of commercial dolphin operations. The local residents are also concerned as a lot of money is being generated, but most of these funds do not go back into the community and coastal environment.

4.4 Management of Hawaiian spinner dolphins and pending regulations

One of the greatest difficulties in marine tourism management has been reactive approaches to species conservation. Many attempts to improve dolphin-swim practices have been made with voluntary guidelines for businesses; however, there is little evidence to suggest that the recommendations result in improvement of operator and tourist behavior (Finkler and Higham, 2004). Hall (2001) emphasizes the role of policy instruments in helping to manage human behavior including regulatory procedures such as laws, permits, and voluntary standards. The problem with these suggestions is that they ignore the intricacies of human attitudes and do not consider pre-established management systems or address changes in perception as human activities increase. Without community buy-in, there is little chance that individuals will adhere to new rules. In Hawai‘i, resource management is undertaken by state and federal governments that have moved away from local-level organization due to land privatization, demographic changes, and increased tourist movement (Friedlander et al., 2013). Since the dolphin bays are now being utilized by businesses, residents, and tourists for cultural, recreational, and commercial purposes, natural resource managers are challenged to find a balance between the different user groups.

Discussion of regulations concerning swimming with wild Hawaiian spinner dolphins has been contentious. Residents who swim with the dolphins on a frequent basis feel that it is their right to do so, but do not necessarily agree with the growing commercial operations that offer dolphin-swims (Wiener, 2015). Dolphin tour operators have had a history of government mistrust and frustration over the lack of control of aggressive companies

(Wiener, 2015). Different users are present in the bays, and understanding how these groups interact with the dolphins and other local residents is critical to help inform a better management plan for the community.

The NOAA Pacific Islands Regional Office, in conjunction with the Fisheries Science Center, are in the process of proposing new rules for Hawai'i (Tyne et al., 2014). When asked about the current rules protecting Hawaiian spinner dolphins and regulating dolphin-swim businesses, 83% ($n=39$) of interviewees felt that the current regulations were ineffective and are dissatisfied with the protections. Additionally, over three quarters of those interviewed 78.7% ($n=37$) felt that the relationship between the marine managing agencies, the community, and the commercial dolphin-swim operators was negatively influenced by conflicting views on dolphin-swims. The majority of respondents 70.2% ($n=33$) did not have a preference for the type of management agency involved in implementing regulations; however, a significant difference was found in the preferences between Kailua-Kona and Wai'ananae ($p=.012$). Seventeen percent ($n=8$) of the commercial Kailua-Kona respondents favored non-profit involvement over federal and state government as they considered them to be the most trustworthy.

The commercial respondents' biggest complaint regarding federal management initiatives was that they lacked the needed information to impart fair regulations. Some respondents, 12.8% ($n=6$), indicated that they expected managers to have a good knowledge of the dolphins' behaviors and habitats, and understand the needs of the community. The fact that managers were not often on the water was echoed in almost every community

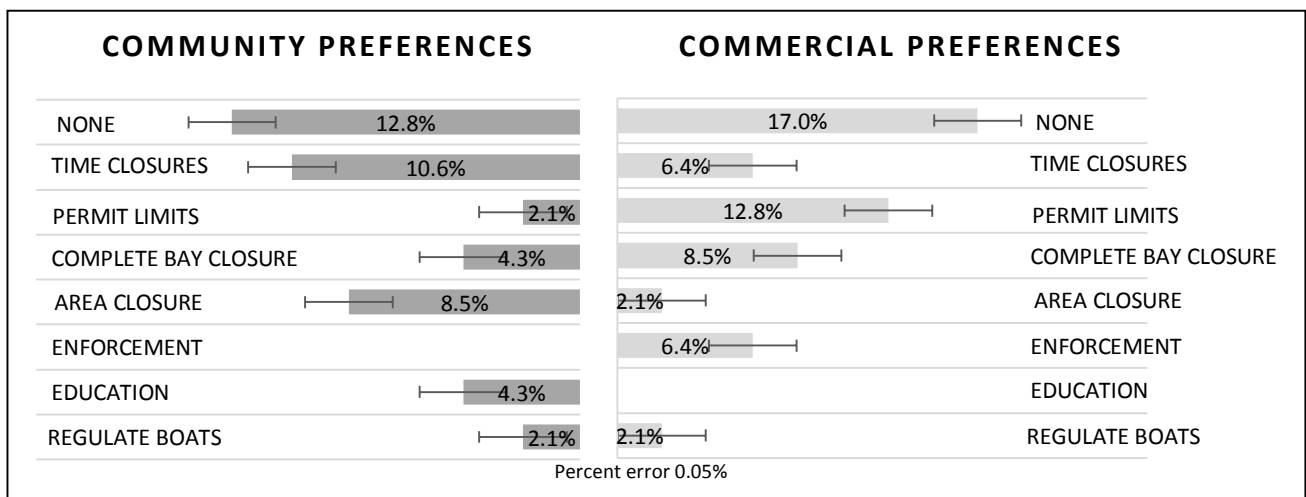
interview. Many commercial respondents also wanted to see more involvement from state managers pertaining to enforcement. Respondents' expectations of what a conservation manager should do revolved around enforcement, 34% ($n=16$), and education, 29.8% ($n=14$). Contrary to resident viewpoints, federal agencies have funded spinner dolphin projects, including education programs such as Dolphin SMART (NOAA, 2013). Unfortunately, the voluntary Dolphin SMART program that requires companies to adhere to certain guidelines has not been adopted by many companies. Self-enforcement through the establishment of community programs such as the CORAL standards (2010) and Dolphin SMART (2011) were not popular with local residents. One reason may be that these programs do not allow for in-water interactions with Hawaiian spinner dolphins.

Current NOAA (2013) recommended guidelines suggest no entry into the water when dolphins are present, and keeping a 50-yard distance from dolphins. Commercial respondents' motivations to comply with these established distances are minimal, as they claim that this is an unrealistic expectation of ocean users let alone businesses that depend on interactions with the dolphins. Ultimately, dolphin-swim operators are affected by management decisions and depend on the dolphins for their income. The commercial respondents commonly expressed economic dependence on dolphin-swim operations:

I am afraid that NOAA will shut the whole coast to tourist activity – that's unrealistic because tourism dollars are primarily funding the state. We have let this thing get way too far and now shutting down the dolphin-swim industry is going to be hard, you are putting people out of business, and people dependent on it for their livelihood.

Commercial respondents shared concerns that if new rules banned or significantly changed swimming with dolphins, their entire livelihood would be uprooted. Of the commercial respondents, 38% ($n=18$) said they would switch to another marine mammal species. Some companies already do this opportunistically with bottlenose dolphins, spotted dolphins, and even pilot whales. Prospects to do this currently exist, but, many of these species are found in deeper water requiring operators to go farther offshore. Other concerns were expressed about visitors who come specifically to Hawai‘i to swim with the dolphins; commercial respondents felt that visitors could easily go to other locations such as Tonga, New Zealand, Australia, or Costa Rica where it is legal to swim with whales and dolphins. Despite this, 51% ($n=24$) of respondents believed that tourists would still participate in dolphin tours in Hawai‘i even if they could not get in the water with the dolphins.

Figure 11. Preferences for Hawaiian spinner dolphin-swim regulations.



Currently, it is unknown what the new rules will look like, but, NOAA has shared some of the regulations under consideration at previous public meetings. While concern about regulation was high among the commercial respondents, most of those interviewed were still troubled about the spinner dolphins swim industry and need for improved conservation. Figure 11 illustrates responses to the proposed management rules, 29.9% ($n=12$) indicated that no recommendations were needed, and significant differences in management preferences were found between islands ($p=.012$).

Kailua-Kona commercial respondents indicated no need for management and favored community-based initiatives emphasizing education. The Wai‘anae commercial respondents requested more enforcement. Among the community, there was a greater diversity of preferences including: new regulations such as time closures (10.6%) and area closures (8.5%) of dolphin bays. This differed from commercial management choices for permit restrictions (12.8%) and complete bay closures (8.5%) (see Figure 11). Commercial respondents who selected complete bay closures or education as good management initiatives also defined a successful dolphin tour as being able to see dolphins. This differed from those who favored no management initiatives and defined a successful dolphin tour as being able to put people in the water with dolphins. The commercial respondents demonstrated a gradient of support for enforcement, reflective of their business model and level of interaction with the dolphins. The companies that mostly watched or snorkeled from afar were interested in stronger regulations.

5. Conclusion

Community and commercial attitudes pertaining to the ethics and practice of swimming with wild dolphins greatly differed in this study. Respondents expressed passion and care for the Hawaiian spinner dolphins; however, because of the varying nature of interactions with the dolphins and dolphin-swim participants, the commercial and community respondents viewed spinner dolphins in distinct ways. Significant differences were seen between commercial respondents in Wai‘anae and Kailua-Kona, further emphasizing differences between the ways these respondents operate. Historical mistrust of both state and federal government has made the implementation and acceptance of proposed regulations difficult, but necessary, given the reported increase of commercial use and expansion of dolphin-swim companies. The lack of enforcement to ensure fairness between commercial and community use of dolphin habitat and the well-being of the dolphins was a common concern. A balance between respecting both the commercial and community respondents and the dolphins has to be achieved. Improved regulations in bays with high Native Hawaiian residence should be a priority to balance the influx of visitor’s use for recreational purposes. Dolphin-swims have been overlooked for far too long, and as a result emotions are high among divided residents. Insight into these attitudes will hopefully drive regulations that strive to take into account all viewpoints and needs, while offering sufficient protection for the Hawaiian spinner dolphin.

Chapter 5: Cashing in on spinners: Economic estimates for wild dolphin-swim tourism in the Hawaiian Islands

Preface

Cashing in on spinners: Economic estimates for wild dolphin-swim tourism in the Hawaiian Islands presents the first economic valuation of wild Hawaiian spinner dolphin tourism comparing the same two locations as in Chapter 4. Using semi-structured interviews with operators and business owners, as well as market research and boat-based observations, I was able to estimate that the dolphin tourism industry is bringing in more than \$100 million USD to the Hawaiian Islands annually. This chapter also provides a preliminary calculation of the lifetime value and average hourly income earned by an individual dolphin, giving context for not just the earning power of the operators, but also the species targeted. These values are not meant to be used as a utilitarian argument in favor of dolphin-swim operations, but to be considered as an approach to assess how revenue can be channeled back into marine conservation and enforcement of regulation. Examining not just the earning potential of the businesses, but also the dolphins themselves offers a more egalitarian approach. The application of this information to policy makers is discussed in the conclusions. The methods and conclusions drawn in this chapter are universally applicable to global wildlife tourism cases and provide insight into a complex and evolving issue. This paper has been submitted to the *Ecological Economics* journal for consideration. Co-authors David Johnston, Leesa Fawcett, and Paul Wilkinson provided recommendations for this manuscript.

Chapter Summary

This study presents the first revenue assessment of Hawaiian spinner dolphin tourism conducted on two populations comparing dolphin viewing and swimming tours. Wild dolphin-swim tourism in Hawai‘i has grown in specific locations where Hawaiian spinner dolphins (*Stenella longirostris*) have known resting habitat. The increased growth in dolphin-swim businesses and interest in dolphin-swims amongst tourists has created an industry that is estimated to bring in more than \$100 million USD to the Hawaiian Islands annually. Semi-structured interviews with operators and business owners, market research, and boat-based observations provide a platform for estimating the revenue generated from dolphin tourism in two popular locations, Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island. The total income for dolphin-swim tourism is presented using a peak season and utilization rate model. These calculations provide an annual estimate of the number of dolphin tour participants and direct revenue for both dolphin-swim and viewing tours. The results show that dolphin viewing companies are making a larger profit than dolphin-swim businesses, however, both avenues are generating large earnings. Sizable differences between businesses in Kailua-Kona, Hawai‘i Island and Wai‘anae, O‘ahu are discussed. The average annual and hourly income earned from an individual dolphin is presented as context for the calculated lifetime monetary value of a dolphin present in bays where tourism occurs. These values can be used to assess how revenue can be channeled back into marine conservation, regulation enforcement, and/or restoration of habitat to ensure better protection of the Hawaiian spinner dolphin.

1. Introduction

The wide spread adoration of marine mammals over the past century is evidenced by their popularity in mass media (Burnett, 2010; Wiener, 2015a). This has trickled into wildlife tourism leading to growth and expansion of whale and dolphin excursions (Delfour, 2007; Heenehan, et al., 2015; Higham, Bejder, and Lusseau, 2009; Hu, Boehle, Cox, and Pan, 2009). Interaction with marine species in natural settings has become a critical aspect of the broader tourism industry (Catlin, Hughes, Jones, and Campbell, 2013; Orams, 2013). Marine mammal tourism now occurs in over 119 countries and is worth an estimated \$2.1 billion (USD) annually (O'Connor, Campbell, Cortez, and Knowles, 2009). In recent decades, dolphin-swim tourism has developed on a similar path of expansion. Hot spots for dolphin-swim tourism have become established in coastal communities with access to marine mammal populations (Wiener, 2015b). Developing countries such as the Philippines and Taiwan are increasingly using this type of tourism and now outnumber developed countries doing so (Mustika, Birtles, Everingham, and Marsh, 2013; Samonte-Tan et al., 2007).

Escalating marine mammal tourism has led to investigation of how this growth is affecting whale and dolphin populations. Several studies have observed negative impacts (Courbis and Timmel, 2009; Danil, Maldini, and Marten, 2005; Heenehan et al., 2015; Higham et al., 2015; Lammers, 2004; Tyne, Pollock, Johnston, and Bejder, 2014), yet communities advocate these activities for growth in local economies. With the majority of research focused on the biological impacts of dolphin-swim tourism, little attention has

been paid to the social and economic effects. Few studies have identified the financial productivity of these activities, and how the profits are distributed within local economies (Hoagland and Meeks, 2000; Mustika et al., 2013; Yacob, Shuib, Mamat, and Radam, 2007). Recent decline in fish catches and degradation of coastal ecosystems has led some fishers to tourism as a way to overcome economic challenges, while others have been driven away from traditional catch grounds due to expansion of tour boats (Orams, 2013). This is why both economic and social costs must be considered in tandem as there are benefits and losses derived from marine mammal tourism that cannot be measured individually (Mustika et al., 2013). Location-specific studies are critical in marine mammal tourism as well, because most activities are based around particular populations that are attached to certain cultural contexts. As a result, economic analysis undertaken in one location cannot always be extrapolated to other settings (Catlin et al., 2013).

Currently, no estimates exist for dolphin-swim tourism either locally or globally, reflecting a gap in data. The goal of this research is to identify the economic contexts that perpetuate the dolphin-swim industry in Hawai‘i, not only providing estimates for annual direct revenue brought into the state, but the annual value that each individual dolphin may generate. With dolphin tourism continuously on the rise (Wiener, 2015b), it is important to capture a baseline of what this industry accrues, and how some of these profits might be channeled back into marine conservation, regulation enforcement, and/or restoration of habitat. Several dolphin species are now on the critically endangered list (e.g., New Zealand’s Maui’s dolphin) and the recent extinction of the Yangtze dolphin

highlights the need to better understand what the costs beyond just lost revenues are for a vanishing species. Many factors besides economics come into play when valuing a species, however, for the purposes of this paper, the emphasis will be on financial considerations.

Wildlife valuation is difficult and complex. An approximation of value is the best that can be achieved and typically involves many assumptions placed from an anthropocentric perspective (Knowles and Campbell, 2011; Orams, 2013). Economists often use an approach to valuing natural resources known as Total Economic Value (TEV). This framework for valuation includes direct, indirect, and non-use values (Cagua, Collins, Hancock, and Rees, 2014; Clua, Buray, Legendre, Mourier, and Planes, 2011; Knowles and Campbell, 2011). Use values are utilitarian, exploring services provided to humans from the natural world either directly or indirectly (Millennium Ecosystem Assessment, 2005). Non-use values are the worth placed by humans in knowing that the natural asset, in this case dolphins, exists (Knowles and Campbell, 2011).

Calculation of economic value should not only include use and non-use values of the resource, but also the costs associated with that activity, such as the price of conserving habitat on which the species depends or the estimated costs of the potentially negative effects of tourism activities (Dwyer, Forsyth, and Spurr, 2004; Orams, 2013). Dolphin-swim tourism for the purposes of this paper is considered a direct, non-consumptive, use value. The ecological, sociocultural, and intrinsic values associated with the spinner dolphins are explored in related research. Some studies such as Clua et al. (2011) and

Mustika, Birtles, Welters, and Marsh (2012) approach valuation from a total expenditure, but, this paper will just focus on direct use value.

The Hawaiian spinner dolphin (*Stenella longirostris*) is a small dolphin commonly found in Hawaiian near-shore waters. Spinner dolphins hunt cooperatively at night and are most playful during early morning hours while winding down from evening activities (Lammers, 2004; Tyne et al., 2015). During mid-morning, the dolphins enter a resting state, moving closer together and swim in unison along the sea floor. During these critical mid-morning resting periods, spinner dolphins are most heavily disturbed by tourist vessels seeking to interact with the species (Heenehan et al., 2015; Tyne et al., 2015). Since 1972, the Marine Mammal Protection Act forbids any indirect aggravation (Level B harassment) of marine mammals in United States waters. Dolphin-swim tourism can violate this policy, but, it is difficult to enforce. Concerns that tourist activities directed at dolphins may have population effects (such as habitat shifts, compressing resting times resulting in reduced reproduction, and shifting energy budgets) have been documented (Courbis and Timmel, 2009; Timmel et al., 2008; Courbis, 2007; Dalfour, 2007; Danil et al., 2005; Milette et al., 2011; Östman, 2004; Tyne et al., 2015; Wursig, 1996).

This paper shares results from the first revenue assessment of commercial wild dolphin tourism in Hawai'i. We approximate participant and company numbers and direct revenue from two main dolphin-swim tourism locations, Wai'anae, O'ahu and Kailua-Kona, Hawai'i Island. An appraisal of exposure and income generated from each dolphin will also be calculated providing an estimate of how much each dolphin contributes to

annual revenue and revenue over their lifetime. This information will assist marine resource managers who need to consider regulations, the economic benefits, and community impacts of dolphin tourism.

2. Methods

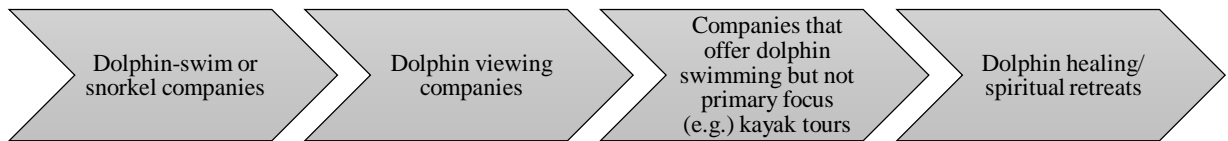
Valuations rely on both market and non-market information to estimate value and obtain expenditure. Income from ticket costs will provide a starting point for an evaluation of dolphin tourism in Hawai'i and its economic significance to the state. Estimates provided are based on contingent valuation, participant observation, tour operator interviews, and market research conducted from July 2012 to March 2013. These methods in combination provide validity to the information shared through the interviews and strengthens the depth of analysis.

2.1 Sampling and data collection

Tour operator information was entered into a database using marketing materials and internet inquiries. Vessel capacities, trip schedules, and prices were obtained from these sources and 77 tour companies were included. Four internet searches were conducted periodically between 2012-2013; any operator that advertised guided dolphin-swims, dolphin watching, or dolphin snorkeling was included in the database resulting in four different operator categories (Figure 12). Annual revenues of each vessel were estimated by combining publicly available ticket prices, trip schedules, and capacity data with a

utilization rate estimate based on interview data similar to other valuation studies (Utech, 2000).

Figure 12. Wild dolphin tourism operator categories



Semi-structured interviews were conducted with 26 dolphin-swim operators and company owners to assess the revenues generated from dolphin tourism and the perceptions of the growth of the industry. Operators were asked for information about seasonal activity, revenue generated, the types and number of trips offered, number of passengers per trip, and vessel capacities. These data enabled calculation of vessel specific estimates of direct revenues, also providing information about utilization rates, e.g., average number of passengers per trip, etc. Interview protocols adhered to the standards of the Canadian Tri-Council Research Ethics guidelines. Participants were selected using purposive and snowball sampling. Cooperative inquiry was included in transcription, allowing interviewees a final opportunity to confirm or re-clarify recorded notes (Braun and Clarke, 2006).

Additionally, field observations were made on 40 days resulting in over 257 hours at 14 known dolphin-swim sites (eight in Wai‘anae, O‘ahu; six in Kailua-Kona, Hawai‘i Island). Boat-based study allowed for observation of the number of boats and swimmers in the water with the spinner dolphins throughout the year. The observations served as a

control for the utilization rate estimate or peak season timeline (*PST*) that was established based on company sales and operator experience. Observations also provided an assessment of human use including the mean length of swims and number of drops per trip.

2.2 Calculations

Dolphin-swim tourism expenditure was calculated based on similar methods conducted in a study by Clua et al. (2011). The mean participation and direct expenditure on boat-based dolphin-swim tourism in Kailua-Kona and Wai'anae were calculated using a peak season timeline (*PST*) model developed with information obtained from operator interviews and participant observation. Months were divided by mean boat trips per week and categorized into three periods of peak (an average of seven or more boat days per week), average (an average of four to six boat days per week), or slow (an average of zero to three boat days per week) seasons. Months were divided by mean weekly trip numbers to calculate the monthly average boat trips (see Table 6). This model gives a monthly average that provides conservative estimates to account for daily fluctuations in the number of participants. Interviewees cautioned, however, that variations occur from year to year depending on the economic conditions of the country. To ensure consistency of the interview and observation data used to input the model, the monthly changes were compared with the 2013 Hawai'i Tourism Authority (HTA) visitor numbers for each island (see Figure 13).

Utilization rate estimates were calculated using the peak season timeline (*PST*) established below. For each individual company, the number of boats (*b*) was multiplied by the number of trips they conducted each day (*t*), and by the boat capacity (*c*). This total was then multiplied by the peak season timeline (*PST*) to produce an annual estimate of participants for each company [$x = bt(c)(PST)$].

Primary direct expenditure was calculated by multiplying the utilization rate estimate to the ticket price (*co*) for each dolphin tourism company. This generated an annual estimate of incomes that could be added together to provide a revenue estimate for the dolphin tourism industry in O‘ahu and Hawai‘i Island. Separate analysis was run for Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island because of the local differences in boat size and style of operators.

Both the hourly and lifetime revenues were estimated for an individual spinner dolphin. To estimate the hourly wage generated by any given spinner dolphin observed in swim bays (*DRH*), a formula was developed based on mean revenues, boat behaviors, and the number of dolphins present during observed swims. The mean revenue per trip for one boat was first calculated by multiplying the mean boat capacities (*C*) by the mean revenue per person (*RPP*). Once this was calculated, the total was multiplied by the median number of boats observed (*B*), and then by the median drop frequency (*D*) and median drop duration per day (*M*). Finally, the total was divided by the median number of observed dolphins in the bay (*Do*). The median was used for the observed data to rule out any outliers in the dataset. The *DRH* provides a mean estimated hourly revenue which

assumes the minimum exposure with random cycling of dolphins. The model does not account for all the other dolphins not in the bay, or the probability of them in the bay.

$$DRH = \frac{[(\theta C)(\theta RPP)] (\tilde{x} B) \left[(\tilde{x} D) \left(\frac{\tilde{x} M}{60} \right) \right]}{\tilde{x} Do}$$

DRH = hourly dolphin revenue; C = capacity; RPP = revenue per person; B = number of boats in the water with dolphins; D = dolphin swim drops per trip; M = minutes per dolphin swim drop; Do = number of dolphins in the bay during swims

Using a similar method to Catlin et al. (2013), Knowles and Campbell (2011), and others, a total revenue per dolphin over their lifetime (*DRL*) was calculated using the estimated 26 year life expectancy of the whitebelly spinner dolphin (Larese and Chivers, 2008). It should be noted that other studies have shown spinner dolphins to potentially live 30 years or longer; however, for the purposes of this paper the most conservative estimate was selected. The lifetime revenue was calculated by dividing the estimated dolphin tour annual revenue by the estimated dolphin population to get the annual expenditure per dolphin (*ED*). Once this was calculated for each island, the discount rate (*r*) plus one was calculated with each year of the average dolphin lifespan (*t*). The *ED* was then divided by this discount rate for each year, and then all 26 were totaled together to get the final *DRL*. This was done separately for each island to account for the differences in annual revenue and dolphin populations.

$$DRL = \sum \frac{ED}{(1+r)^t}$$

DRL = spinner dolphin value over lifetime; ED = Dolphin swim tourism annual average expenditure per dolphin; r = discount rate; t = life expectancy of average spinner dolphin

Present value is used to estimate the capitalized value of lifelong revenues per dolphin by discounting future values at a certain rate (Clark, 2010; Clark, 2006; Knowles and Campbell, 2011). For every year that goes by in a dolphin's life, the chance that it is alive continues to decrease. Using a discount rate helps to account for the decreased risk of life expectancy; however, discount rates can vary. Previous marine-based discount rates have ranged from 10% for marine protected areas (Samonte-Tan et al., 2007), 8% for lemon sharks (Clua et al., 2011), 5% for reef sharks (Vianna, Meekan, Pannell, Marsh, and Meeuwig, 2012), and 2.65% for humpback whales and whale sharks (Catlin et al., 2013; Knowles and Campbell, 2011). Lower discount rates place greater emphasis on future value (i.e., 2.65%), whereas the larger end of the scale (i.e., 10%) value present day. There are several rationales for a discount rate, usually based on private or social opportunity cost. Given that the literature shows no decline in dolphin tourism, with potential for growth in the industry, the discount value of 2.65% was selected to represent the Hawaiian spinner dolphin.

The data presented here represent one of three studies using the same data to examine spinner dolphin-swim interactions in Hawai'i; the use of a multiple methods approach allows for integrative and holistic research.

3. Results

3.1 Peak season timeline (PST)

A peak season timeline (*PST*) was calculated for each location to predict the number of annual participants in dolphin-swim tourism; this was also used to determine an estimate

of revenues for the wild Hawaiian spinner dolphin-swim industry (see Table 6). An average of 347 boat trips per year was calculated for Wai‘anae, O‘ahu and 254 for Kailua-Kona, Hawai‘i Island. A total of two peak periods were established during mid-winter (end of December, end of January to February) and mid-summer (July and August) for Kailua-Kona, while peak numbers were consistently seen in Wai‘anae with the exception of a slowdown in the fall (September and October). The *PST* model was also run using average values for blank interview responses that populated the timeline content. There were no significant differences when the model was run this way.

Table 6a. Wild dolphin-swim industry peak season timeline (*PST*) for Wai‘anae, O‘ahu.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Period	Peak	Peak	Peak	Peak	Peak	Peak	Peak	Peak	Avg.	Avg.	Avg.	Peak
Avg. trip days/week	7	7	6.82	6.69	6.69	6.85	7	7	5.92	5.92	5.92	7
Avg. weeks/month	4.43	4	4.43	4.29	4.43	4.29	4.43	4.43	4.29	4.43	4.29	4.43
Avg. trip days/month	31.01	28.0	30.21	28.70	29.64	29.39	31.01	31.01	25.40	26.23	25.40	31.01

Table 6b. Wild dolphin-swim industry peak season timeline (*PST*) for Kailua-Kona, Hawai‘i Island.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Period	Peak	Peak	Avg.	Avg.	Avg.	Avg.	Peak	Peak	Slow	Slow	Slow	Avg.
Avg. trip days/week	6.63	6.5	5.11	4.56	4.25	4.25	6.65	6.65	2.86	2.86	3	5.16
Avg. weeks/month	4.43	4	4.43	4.29	4.43	4.29	4.43	4.43	4.29	4.43	4.29	4.43
Avg. trip days/month	29.37	26.0	22.64	19.56	18.83	18.23	29.46	29.46	12.27	12.67	12.87	22.86

The *PST* model was also contrasted with the 2013 Hawai‘i Tourism Authority (HTA) visitor numbers for each island to see if the peak trends were consistent (see Figure 13).

Figure 13a. Comparison of HTA visitor numbers and the wild dolphin-swim industry peak season timeline (*PST*) for Wai‘anae, O‘ahu.

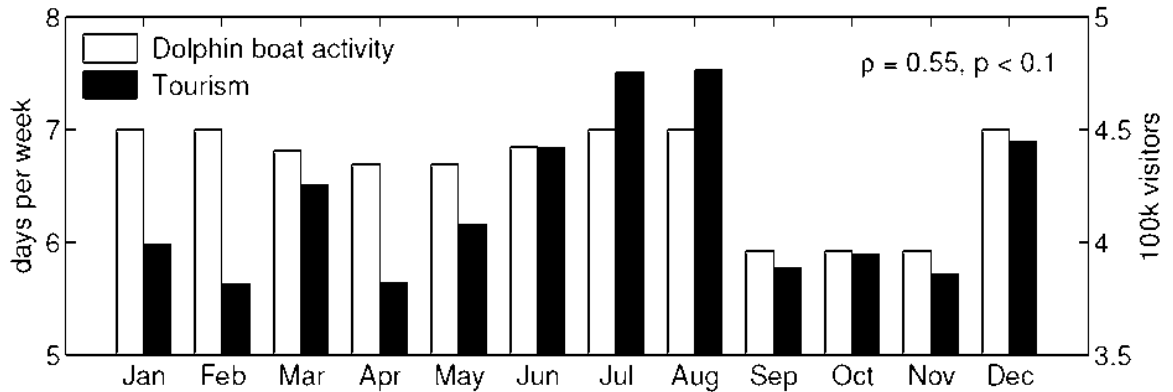
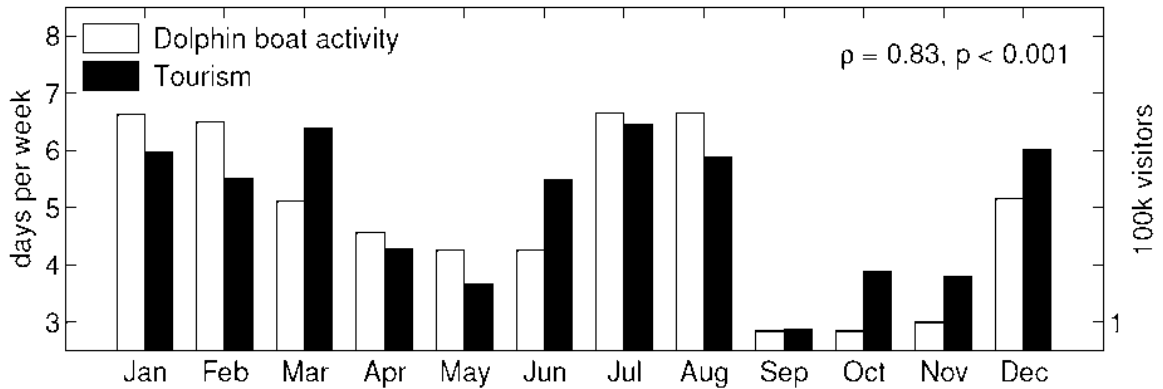


Figure 13b. Comparison of HTA visitor numbers and the wild dolphin-swim industry peak season timeline (*PST*) for Kailua-Kona, Hawai‘i Island.



3.2 Utilization rate estimates

A total of 77 dolphin tour companies were used in this evaluation, including 65⁴ boats across both islands. The number of vessels operating in Wai‘anae, O‘ahu (15 boats) was less when compared to the 50 based in Kailua-Kona, Hawai‘i; however, the vessels on

⁴ Some companies work from shore.

O‘ahu were much larger, holding on average 27.7 people per trip. The total number of dolphin-tour companies was also smaller on O‘ahu; 12 companies, compared to the 65 in Kailua-Kona (see Table 7).

Table 7. Commercial dolphin tour and dolphin-swim utilization rate estimates

Company Type	Companies	Boats (<i>b</i>)	Daily Trips (<i>t</i>)	Capacity (<i>c</i>)	Participants (utilization estimate)	Swim Watch Difference p-value (99% confidence)
Wai‘anae, O‘ahu						
Total Tours	12	15	20	499	453,542	0.005
Dolphin Swims	8	11	13	221	174,893	
Dolphin Watch	4	4	7	278	278,649	
Kailua-Kona, Hawai‘i Island						
Total Tours	65	50	87	1221	299,220	< 0.001
Dolphin Swims	47	31	65	356	788	
Dolphin Watch	6	7	9	470	223,459	
O‘ahu and Hawai‘i Island						
Total Tours	77	65	107	1720	752,762	< 0.001
Dolphin Swims	55	42	78	577	175,681	
Dolphin Watch	10	11	16	748	502,108	

3.3 Primary direct expenditure

Overall ticket revenues have increased since 2006, jumping from an average dolphin-swim tour revenue of \$111 (USD) (Boehle, 2007) to \$148.50 (USD) (see Table 8). Wai‘anae, O‘ahu remains more expensive than Kailua-Kona by \$19 (USD). The higher average ticket total combined with the increase in participants resulted in \$13,802,819 (USD) more in direct dolphin-swim revenue in Wai‘anae, O‘ahu. The total estimated direct dolphin-swim tour revenue for both O‘ahu and Hawai‘i Island in 2013 was \$102,024,953 (USD); this does not include spiritual retreats or companies that offer dolphin-swims as secondary revenue.

Table 8. Commercial boat-based dolphin-swim participants and direct revenue estimates by operator categories

Company Type	utilization rate estimate $x = bt(c)(PST)$	Avg. ticket cost	Total Annual Revenue	Average Annual Revenue		Range
				Mean	Median	
Wai‘anae, O‘ahu						
Total Tours (n=12)	453,542	\$139	\$57,913,886	\$5,655,135	\$3,951,750	\$864,055-\$16,442,028
Dolphin Swims (n=8)	174,893	\$158	\$25,625,994	\$3,203,249	\$2,446,768	\$864,055-\$6,509,908
Dolphin Watch (n=4)	278,649	\$120	\$32,287,892	\$8,071,973	\$7,922,932	\$6,051,854-\$16,442,028
Kailua-Kona, Hawai‘i Island						
Total Tours (n=34)	299,220	\$129.50	\$44,111,067	\$1,154,136	\$353,366	\$152,532-\$9,182,426
Dolphin Swims (n=28)	788	\$124.67	\$13,584,711	\$460,011	\$313,708	\$152,532-\$1,586,333
Dolphin Watch (n=6)	223,459	\$120	\$26,360,326	\$4,393,388	\$4,514,057	\$167,785-\$9,182,426
O‘ahu and Hawai‘i Island						
Total Tours (n=46)	752,762	\$148.50	\$102,024,953	\$1,882,330	\$353,366	\$152,532-\$16,442,028
Dolphin Swims (n=36)	175,681	\$141.34	\$39,210,705	\$1,069,620	\$465,223	\$152,532-\$6,509,908
Dolphin Watch (n=10)	502,108	\$120	\$58,648,218	\$5,864,822	\$4,514,057	\$167,785-\$16,442,028
Other Hawai‘i Island Dolphin Activities*						
Watch/swim** (secondary)	36,989	\$118	\$4,166,030	\$347,169	\$296,103	\$91,519-\$1,112,213
Spiritual retreats***	384	\$1547	\$704,400	\$38,051	\$20,340	\$534-\$112,800

All costs estimated to the nearest US dollar. *Only calculated for Kailua-Kona, does not seem to occur in O‘ahu. ** PST 127.11 (PST (254.22) divided by two because multi-purpose group). *** PST 63.56 (PST (254.22) divided by four because multi-purpose group). Retreats held yearly PST not available and average cost was used.

3.4 Hourly wage generated per dolphin

Boat-based participant observation data was collected over the course of 40 days (see Table 9). There were significant differences between islands with an average of 3.91 boats found per encounter with the dolphins in Kailua-Kona and 2.70 boats per encounter in Wai‘anae. Overall, a maximum of 12 boats were observed in Kailua-Kona and 9 in Wai‘anae. This is consistent with other studies that have observed up to 13 boats in

Kailua-Kona (Heenehan et al., 2015) and 9 in Wai‘anae (Milette et al., 2011). More dolphins per swimmer were found in Kailua-Kona, but there were also fewer swimmers than dolphins. A maximum of 95 dolphins were observed in Wai‘anae and 65 in Kailua-Kona, again, consistent with previous research (Heenehan et al., 2015; Milette et al., 2011). The average number of drops was similar between islands.

Table 9. Mean daily dolphin exposure values by island*

Location	No. of boats	No. of dolphins	No. of swimmers	Drop duration	Drop Frequency
Wai‘anae, O‘ahu	2.70	27.97	21.93	16.54	2.42
Kailua-Kona, Hawai‘i Is.	3.91	28.65	16.24	19.04	2.52
Difference Kailua-Kona – Wai‘anae	1.21**	0.68	-5.68**	2.50	0.10
p-value	0.004	0.86	0.03	0.22	0.71

*Numbers represent observations taken within a specific time period, and do not represent repeated encounters throughout the day. **These values are significant at the 95% level using a two-tailed t-test

Using the *DR* model, an individual spinner dolphin in a bay with commercial dolphin-swim boats in Wai‘anae, O‘ahu could generate an estimated \$193 USD per hour; this decreases to approximately \$145 per hour in Kailua-Kona, Hawai‘i Island. As of 2016, the current minimum wage rate in the state of Hawai‘i is \$8.50. This means that dolphins in Hawai‘i have the potential to generate up to 23 times the minimum wage in O‘ahu and 17 times the minimum wage in Hawai‘i Island. The hourly wage potential calculated for the spinner dolphin does not account for the other operator costs such as fuel, equipment, employee wages, owner profit, etc. Therefore, the wages will decrease once the operational costs are accounted for.

3.5 Lifetime value per dolphin

There have been several spinner dolphin population studies conducted in Kailua-Kona (Norris, Würsig, Wells, and Würsig, 1994; Östman, 1994); the most recent estimates of 524-761 dolphins predicted with 95% confidence by Tyne et al. (2014) will be used in this paper. Unfortunately, the Wai‘anae coast on O‘ahu has not received the same attention as Kailua-Kona, and no official population estimates are available. Based on preliminary studies, abundance estimates for the island of O‘ahu were estimated at 329 spinner dolphins (NOAA NMFS, 2012). These island populations cannot be grouped together as they not only exhibit unique behavior characteristics, but are genetically diverse and are considered unique stocks (Andrews, 2010). Table 10 provides an overview of the estimated worth of spinner dolphins annually and over their lifetime.

Table 10. Annual and lifetime revenue estimates for the Hawaiian spinner dolphin

Dolphin Population	Total Annual Revenue (USD)	Est. Dolphin Population	Est. Mean Annual Income Per Dolphin (USD)	Over lifetime – Discount Rate	Dolphin earnings per hour (USD)
Wai‘anae, O‘ahu	\$57,913,886	329	\$176,030	\$3,364,316	\$193
Kailua-Kona, Hawai‘i Island	\$44,111,067	524–761	\$57,965 - \$84,181	\$1,107,837 - \$1,608,882	\$145

4. Discussion

Dolphin tourism is only one segment of Hawai‘i’s multi-faceted ocean tour boat industry, and the spinner dolphins not only play a role in dolphin-swim tourism, but other areas of the marine tourism industry as well, including snorkel and dive tours, whale watching, and charter fishing. According to the 2012 visitor activity and satisfaction report, 25.5%

of all visitors to Hawai‘i participated in a boat-based marine mammal activity during their vacation; this equates to approximately 1.8 million tourists annually (Hawai‘i Tourism Authority, 2012). As demand for the activity grows and new companies become established, more and more pressure mounts on the dolphins, whose population is estimated to be decreasing (Tyne et al., 2014).

An impact assessment was completed on dolphin-swim tourism in Hawai‘i by Boehle (2007); comparing the results of this study to the observations above, dolphin-swim businesses have grown by 33% on O‘ahu and 23% on Hawai‘i Island. Contrasting these results to other marine mammal tourism in Hawai‘i, dolphin-swim boats could potentially be generating the greatest income. According to Utech (2000), whale watching in Hawai‘i constitutes 52 vessels totaling \$11-16 million (USD) annually in direct revenue. While this is similar to the \$13.5–25.6 million (USD) from dolphin-swims, Utech’s (2000) numbers are outdated and all income is generated during a smaller window of time (Nov – Apr). Further studies using similar methods on both humpback whale watching and snorkel tours should be considered.

4.1 Peak season timeline (PST)

The peak season timeline (PST) established in this research showed only a slightly significant relationship between the model and the tourism numbers for O‘ahu ($\rho = 0.55$, $p \leq 0.1$); this was to be expected given that the dolphin boat activity remains constant for most of the year. Unlike humpback whales, which are a seasonal marine mammal species in Hawai‘i (peak season is November through March), Hawaiian spinner dolphins can be

found reliably year round. This demonstrates that the dolphin-swim businesses in O‘ahu are not influenced significantly by tourism fluctuations. During the slower fall season (September to mid-November), the HTA model also showed fewer visitors to the island. Kailua-Kona, Hawai‘i Island presented a very different dolphin-swim tourism pattern and this was reflected in the significant relation to the HTA visitor numbers ($\rho=0.83$, $p\leq 0.001$).

As demonstrated above, stark differences between islands exist for revenues generated and the number of dolphin-swim participants. Previous research and considerations for dolphin-swim tourism in Hawai‘i have lacked any inter-island comparisons, lumping populations and businesses across the state, or only focusing on one area. This is problematic as they do not properly inform conservation managers who are currently exploring implementation of new regulations (Wiener, 2015a). Not only is there dramatic differences in revenue generation, but also in boat numbers, boat sizes, the way dolphin-swim companies conduct their businesses, and even variance in observed behaviors between dolphin populations. Tour operator expenses such as fuel costs, boat maintenance, slip fees, and employee salaries were not collected in interviews, and therefore are not deducted from total revenue. Future work should consider adding these costs to get a better estimate of actual revenue. The rapid growth of businesses on both O‘ahu and Hawai‘i Island also decrease the value and accuracy of previous studies.

4.2 Utilization rate estimates

Using the utilization rate estimation, 174,893 participants were found to be going out on the dolphin-swim boats in Wai‘anae annually versus 788 in Kailua-Kona. The mean number of participants per company for Wai‘anae is significantly more ($p \leq 0.001$) than the participants per company in Kailua-Kona. The greater number of participants on O‘ahu is somewhat surprising given the number of boats (*b*) and companies in Kailua-Kona. The mean 12.7 person capacity (*c*) on the small boats in Kailua-Kona is the main reason for the discrepancy in dolphin-swim participants. For both islands, 752,762 people are estimated to have participated in boat-based commercial dolphin tours annually. This is 632,762 more than a preliminary estimate that was conducted statewide in 2008 (O‘Connor et al., 2009). There are also significant differences between the mean number of participants going out with dolphin-swim companies and the related dolphin watching tour boats. In both Wai‘anae ($p=0.005$) and Kailua-Kona ($p \leq 0.001$) the dolphin watch boats had more participants, again most likely due to boat capacity.

The participant estimates for both islands grossly underestimates the number of people directly engaging with the dolphins. There are many interest groups that swim with the dolphins outside of commercial boat-based tours, both with resident and tourist communities. Most of the shallow bays where people swim with the dolphins can be accessed from shore as well as by boat, making it easy for people to reach the dolphins. There is even a group of residents who swim with the dolphins on a daily basis. These numbers are more difficult to calculate as they do not participate in a contained group and

can swim all day instead of during standard boat times. The numbers do not account for private and rented boats that interact with the dolphins as well as chance encounters. Unfortunately, there has not been a directed count of human users, and that is something that should be focused on in an additional study.

Some of the distinctions between Kailua-Kona, Hawai'i Island and Wai'anae, O'ahu may lie in the history and diversity of human use in the bays where the spinner dolphins are found. Dolphin-swims have been occurring in Kailua-Kona for approximately 15 years longer than on O'ahu. There are more shore-based swimmers who participate in dolphin-swims on a regular basis in Kailua-Kona; therefore the dolphins have been exposed to human activity for a longer period of time. Observationally, the Kailua-Kona dolphins seem more comfortable with these interactions and less skittish around human swimmers and boats.

Another difference between the islands is the tour boats and company structure. There are fewer boats on O'ahu, but, they cater to larger groups of participants and go out at least two times a day. This contrasts with the smaller "six-pack" boats that operate once daily in Kailua-Kona. Although these operations cater to a smaller clientel, there are more than double the companies, leading to significantly more boats in the water. Concerns over the increase in dolphin-swim boats have led federal marine managers to consider banning this activity. Dolphin-swim operators and company owners argue that that dolphin-swims bring a lot of income into the local communities, and prohibiting people from interacting with the dolphins in the water would diminish their businesses.

4.3 Primary direct expenditure

When direct annual revenue for both Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island was broken down by commercial categories (see Table 10), wild dolphin swimming activities made \$32,287,892 (USD) less on O‘ahu and \$30,526,356 (USD) less on Hawai‘i Islands than wild dolphin viewing. There are triple the amount of dolphin-swim companies and boats compared to dolphin watching; however, the dolphin-watch boats are much larger than most dolphin-swim vessels and can accommodate a greater number of participants. The average dolphin-swim vessel has a capacity of six in Kailua-Kona and 20 in Wai‘anae, whereas the dolphin-watch vessels have an average capacity of 50.

On both O‘ahu and Hawai‘i Island, the dolphin watch companies as a whole brought in more direct revenue than the dolphin-swim companies. This was extremely surprising given the small number of dolphin-watch boats compared to the dolphin-swim boats; however, the size of the dolphin-watch boats were almost triple that of the other companies.

Other companies that participate in either dolphin watching or swimming, but do not make the activity their primary focus, also brought in \$4,166,030 (USD). This is a significant amount of revenue that is not accounted for when thinking about dolphin tourism. This number is also underestimated as the figures were only taken from companies located on Hawai‘i Island, and does not include private boat rentals. The healing and spiritual retreats that center on the dolphins are not often discussed in dolphin

tourism literature, yet also represent an important group of stakeholders. These businesses are only centered on Hawai‘i Island and, as shown above, are estimated to bring in \$704,400 (USD) in direct annual revenue.

These observations have important implications for how future regulations and management of the growing dolphin-swim industry will be applied. Managers who will be making regulatory decisions should take a close examination at the revenue generated from dolphin tourism as a whole. The marine tourism industry and potential revenue generated from specific species can differ greatly depending on location, activity, animal, and infrastructure. All of these factors should to be taken into consideration when determining rule changes.

4.4 Annual value per dolphin

The dolphin-swims in Hawai‘i generate a higher revenue than other dolphin-swim island locations such as Bali, which have a similar spinner dolphin population with predictable behavior. In Bali, the dolphin-swim tours make US\$4.1 million in direct revenue annually (Mustika et al., 2012). The wild dolphin-swim tours in Hawai‘i not only generate more revenue than dolphin-swims in other locations such as Lovina, Bali (Mustika et al., 2012) and Monkey Mia, Australia (Stoeckl et al., 2005), but are also making more than local whale watching tourism (Utech, 2000). There has been a significant growth in the Hawaiian Islands in a short amount of time.

If the Hawaiian dolphin-swim industry revenue reviewed here is compared to previously explored work (see Table 11), the market in Hawai‘i is among one of the largest generators of revenue annually. Individually, Hawaiian spinner dolphins produce more direct tourism revenue over their lifetime (\$335,338–\$1,463,412) than other species examined, including some populations of humpback whales (Knowles and Campbell, 2011). However, they still are not amongst the top grossing marine animals over their lifetime compared with species such as the Sickfish lemon shark (\$2.64 million) or the reef shark (\$2.31 million).

Table 11. Previous marine tourism valuation studies.

Location	Marine Tourism	Annual Revenue (USD)*	Source
Global	Cetacean	\$ 2,000,000,000	O’Connor et al. (2009), Hoyt (2001)
Massachusetts	Whales	\$ 440,000,000	Hoagland & Meeks (2000)
Antarctic	Wildlife	\$ 55,660,800	Catlin et al. (2013)
Hawai‘i	Humpback whales	\$19,000,000 - \$27,000,000	Utech (2000)
Western Australia	Whales	\$6,029,920 - \$10,668,320	Stoeckl et al (2005)
Australia	Dolphin	\$ 8,163,584	Stoeckl et al. (2005)
Maldives	Manta rays	\$ 8,100,000	Anderson et al. (2011)
French Polynesia	Lemon sharks	\$ 5,400,000	Clua et al. (2011)
Tonga	Whales	\$ 5,000,000	Orams (2013)
Western Australia	Whale sharks	\$ 2,226,432 - \$ 4,267,328	Catlin et al. (2010)
Lovina, Bali	Dolphins	\$ 4,100,000	Mustika et al. (2012)
Hawai‘i	Humpback whales	\$ 3,900,000	Forestell & Kaufman (1990)
BC, Canada	Whales	\$ 3,645,312	Duffus & Dearden (1990)
Australia	Humpback whales	\$ 2,549,000	Knowles & Campbell (2011)
O‘ahu & Hawai‘i Is.	Spinner dolphins	\$ 1,200,000	Wiener et al. (2016)
Australia	Turtle	\$ 742,144	Catlin et al. (2013)
Caribbean	Sharks	\$ 250,000	Catlin et al. (2013)
Palau	Sharks	\$ 179,000	Vienna et al. (2012)
Belize	Whale sharks	\$ 34, 906	Graham (2004)
Maldives	Sharks	\$ 3,300	Catlin et al. (2013)

*Foreign currency was converted to US dollars for comparison purposes using USD conversion rates 08/09/14.

One of the problems that is not often considered with species-specific valuations is the likelihood that some dolphins may be worth more than others. For this study, the average

number of dolphins in the bay was used to calculate revenues, however, only certain bays have dolphin-swim boats and there may be individual dolphins that frequent bays with swimmers more than others. During operator interviews, there were individual dolphins who were called out by name and were very familiar to the residents. Certain dolphins may have individual characteristics either innate or learned that cause them to have greater exposure to swimmers. This is an important consideration, as some dolphins could be worth more than others, which also means that the impact to the population may be less if only a few pods are exposed to swimmers on a daily basis. While Tyne et al. (2014) have provided population estimates for the Hawai‘i Island dolphins, there has been relatively little effort to characterize the O‘ahu population, or bays outside of the Kailua-Kona coast. Without a complete population assessment, it will be hard to give an accurate measure of how many dolphins participate in dolphin-swim activities.

Another component missing from species-specific valuations is the consideration of non-monetary benefits and costs. For example, this valuation found the O‘ahu dolphins to be worth considerably more than the Hawai‘i Island dolphins, but both have equal non-use values and are vital components of the coastal marine ecosystem. The Hawaiian spinner dolphins are appreciated not only by the commercial sector, but also by many residents and visitors who enjoy the mere presence of these dolphins. Some Native Hawaiians also believe that spinner dolphins are important family members and a living piece of their cultural heritage (Cressey, 2009).

5. Causes and Considerations

This paper does not attempt to provide a calculation of non-use or indirect costs associated with dolphin-swim tourism; while this is an important issue, the empirical data gathered from the operators do not lend for this type of examination. The authors assume a direct and positive relationship between the presence of wildlife and tourism value. All efforts to ensure rigor were made and the data was assumed to be accurately reported; however, the results should still be considered interpretive.

The estimates provided in this study only include commercial wild dolphin swim/watch boats and do not constitute the entire dolphin tourism industry such as personal use stand-up paddleboards, kayaks, and shore swimmers. The number of users and revenue are estimates with the best available information as of 2013. There are new companies surfacing on a monthly basis so these numbers may reflect an underestimation. Other considerations not included in this valuation are the impact of increasing boat traffic on the marine environment, growing street traffic, use of local man-made and natural resources, and the rising human conflicts between user groups. The data provided should be taken as an approximation of the dolphin-swim industry in Hawai'i to give an idea of the participant numbers and revenue generated.

Further economic analyses should explore the indirect costs and how much money is being funneled back to the communities surrounding dolphin-swim activities. Socioeconomic conditions vary for Hawaiian residents, and high poverty rates especially

in the Wai‘anae area can exceed 17%, more than 7% higher than the nationwide rate (Impact Assessment Inc., 2007). There is also a lack of government resources within the state to adequately manage and enforce regulations pertaining to human interactions with wildlife. The tendency for marine conservation to be viewed as a cost to government budgets prevails in Hawai‘i, which produces little return on investment (Catlin et al., 2013). The revenue generated through dolphin tourism could easily be used to contribute to better enforcement and protection for the dolphins and community.

6. Conclusion

As a whole, the Hawaiian spinner dolphins and broader marine ecosystem is severely undervalued. A better grasp on the broader economic value of dolphin-swim tourism is necessary to gauge both direct and indirect effects, which are not accounted for in this study. The estimates generated in this research provide a first and rudimentary look at the potential revenue generated from an under-regulated and growing industry. Species valuations should be considered as one way to explore the value of a resource, but cannot be the sole form of evaluation. The income potential identified in this research offers insight into the possible resources that could be made available for conservation and regulation enforcement, while still allowing for economic development. However, as the popularity and revenue growth increase, growing demand will be placed on the spinner dolphin population.

The benefit of providing a first analysis and estimate of the direct revenue associated with spinner dolphin-swim tourism is that it can offer resource managers a way of planning for future growth and risk assessment of a previously underestimated component of the marine tourism industry in Hawai'i. Other valuation studies have been instrumental in assisting with conservation planning, risk mitigation, and disaster management in situations such as oil spills (Caitlin et al., 2013). Resource managers should be working closely with the dolphin tourism stakeholders to better understand how conservation and regulation can be worked into local business models. There are large groups of stakeholders both commercially and in the community that interact with the spinner dolphins on a daily basis. They too could be collecting data on dolphin encounters to enhance the knowledge base and monitoring of the growing number of boats and people interacting with the dolphins in the water. Further understanding of the current practices of companies guiding dolphin tours is critical when reviewing and developing new laws and management of the dolphin-swim bays.

Chapter 6: Diving deep: A first in-water assessment of spinner dolphin-swim tourism in Hawai‘i

Preface

Diving deep: A first in-water assessment of spinner dolphin-swim tourism in Hawai‘i completes the research presented in Chapters 4 and 5. After looking at community and commercial attitudes, and dolphin-swim economics, this chapter presents the first in-water human behavior and attitudes analysis of participants in wild dolphin-swim excursions. This phenomenological study explores the swimmers’ experience, physically, spatially, and mentally, examining the effect of their behaviors on the dolphins; and the attitudes that swimmers hold as a result of these interactions. In addition to the video camera data, participant surveys post-dolphin swim and three months following were collected. Similar to the research in Chapters 4 and 5, results indicate that in-water swimmer conduct differed significantly between O‘ahu and Hawai‘i Island, with more aggressive swimmer behavior in Kailua-Kona. Swimmer behavior and dolphin response are analyzed in this chapter, including swimmer attitudes and related conservation actions following the swim. Appropriate management of human-dolphin interactions depends not just on understanding the effects of tourism on the dolphins, but also considering the human dimensions of those relationships. This chapter brings both those elements together to explore the effects holistically. The work presented here will be submitted to the *Current Issues in Tourism* journal. Co-authors David Johnston, Leesa Fawcett, and Paul Wilkinson provided copy editing for the manuscript. Mika Thompson and Tiara Stark were volunteer student coders for the video data collected.

Chapter Summary

Marine tourism continues to grow at unprecedented rates and interactive swims that incorporate in-water experiences with wild marine mammals make up a large piece of this sector. This phenomenological study, presents the first in-water human behavior and attitudes analysis during wild dolphin-swim excursions conducted in Wai‘anae, O‘ahu, and Kailua-Kona, Hawai‘i Island. Head-mounted video cameras were placed on randomly-selected volunteer participants on dolphin-swim tours to observe swimmer interactions with Hawaiian spinner dolphins (*Stenella longirostris*). Video was collected over a one-year period resulting in 564 dolphin-swim encounters coded for human behavior, dolphin response, and estimated distance from dolphins. Participant surveys ($n=208$) were collected immediately post-dolphin swim and again three months following the activity to provide input on swimmer’s previous experience, swimmers’ interpretation of the activity, and how accurate swimmers’ perspectives were of their behavior during the dolphin-swims. Results indicate that in-water swimmer conduct differed significantly between Wai‘anae and Kailua-Kona, with more aggressive swimmer behavior in Kailua-Kona. Aggressive swimmer actions were defined by chasing, diving, and deliberate approach behaviors. Swimmer aggression was associated with dolphins’ increased breath at surface and diving behavior. This paper discusses both swimmer conduct and dolphin response, including swimmer attitudes towards dolphin-swims and related conservation actions following the swim. We draw conclusions pertaining to regulations and management actions needed for dolphin-swim activities.

1. Introduction

Marine tourism continues to develop at unprecedented rates, generating more than US\$222 billion globally per year (Higham, Bejder, Allen, Corkerton, and Lusseau, 2015). Dolphin tourism constitutes a substantial fraction of this sector with a growing emphasis on interactive swims that incorporate in-water experiences with wild marine mammals (Wiener, 2013). *A priori* tourist expectations for these encounters emphasize intimate interactions with wild dolphins (Lemelin, 2006). Once considered to be a non-consumptive “eco-friendly” activity, studies have shown long-term deleterious effects on dolphin’s ability to forage, rest, and reproduce (Courbis and Timmel, 2009; Danil, Maldini, and Marten, 2005; Heenehan et al., 2015; Higham et al., 2015; Lammers, 2004; Tyne, Pollock, Johnston, and Bejder, 2014). Concerns about the effects of these activities on the dolphins contrast with arguments for the psychological, economic, physiological, social, and educational benefits to humans (Samuels, Bedjer, and Heinrich, 2000; Zeppel and Mulion, 2008).

A majority of research concerning human-dolphin interaction takes place in highly regulated settings, such as marine parks (protected areas) and captive facilities (aquaria) (Anderson, Manning, Valliere, and Hallo, 2010). Wild dolphin-swim tourism lacks such regulation and the research presented in this paper represents a unique perspective on human-dolphin interactions in an uncontrolled, open-ocean environment.

The Hawaiian Islands provide an ideal location for dolphin-swim activities, due to a predictable Hawaiian spinner dolphin (*Stenella longirostris*) population and over eight million tourists visiting annually (Hawaii Tourism Authority, 2014). A 2012 study of visitors to Hawai'i showed that those participating in wildlife tours with high levels of species concern were the same people most likely to harass wildlife (Bernstein, Courbis, Herman, Watson, and Reiser, 2012). Several studies have examined the biological impacts of swim activities on the spinner population (Courbis and Timmel, 2009; Danil et al., 2005; Lammers, 2004; Heenehan et al., 2015; Tyne et al., 2014), yet no research has provided detailed observations of what takes place during the dolphin-swims and how human participants engage in this activity. This paper explores the in-water interactions that occur between humans and Hawaiian spinner dolphins during wild dolphin-swims, as well as the associated human attitudes towards the activity.

Previous studies utilize observations taken from an above-water assessment, while the in-water observations that inform the basis of this work provide a different perspective. For example, dolphins who could be classified as socializing based on above-water observation might actually be a male dolphin aggressively corralling a female (Dudzinski and Frohoff, 2008). This research uses data collected in water to better understand human and dolphin behaviors.

By focusing on the relational space and actions between humans and dolphins during swim encounters, equal agency is assigned to both humans and dolphins. Better insight into human behavior during dolphin-swim interactions is critical to understanding the

potential impact of the swims and thus informing policy. Currently, the United States federal marine management agency, the National Oceanic Atmospheric Administration (NOAA), is proposing rule changes that will directly affect operators' ability to conduct dolphin-swims, in turn limiting tourists access to dolphin-swim experiences. This paper concludes with recommendations to management based on observations from in-water, human-dolphin interactions during swim-with tours.

1.1 A phenomenological perspective

A variety of techniques have been used to investigate dolphin-swim tourism such as mark-recapture studies and focal follows. (Courbis and Timmel, 2009; Danil et al., 2005; Tyne et al., 2014). Dolphin-swim tourism research focusing on human behavior, however, has received little attention. The relationship between tourists and wildlife is complex, and interrelational connections through dolphin-swim tourism can be analyzed using phenomenology. Phenomenology is the intentional analysis of how individuals create meanings from their lived experiences (Van Manen, 2014). The phenomenological approach helps explicate this experience and can be an integral component of tourism research that is based around a participants' encounter (Brymer, 2010; Colangelo, 2015; Curtin, 2006; Pernecky and Jamal, 2010). Phenomenology is used in this study to understand swimmers' experiences during wild dolphin-swims. Examining in-water movement and bodily position is a way of looking into the unique relational space between human and dolphins. By using both observation of in-water behavior, and post-

swim opinions of the experience, we hope to gain a deeper understanding of the dolphin-swim practice.

Other studies focused on tourism use phenomenology to describe the individual experience based on memory, image, and meaning (e.g., Ballantyne, Packer, and Sutherland, 2011; Cloke and Perkins, 2005; Colangelo, 2011; Curtin, 2006; and Merchant, 2011). Assessing dolphin-swim interactions with a phenomenological approach is critical to understanding the ways that participants engage with their senses by emphasizing both the visual and the physical (Besio, Johnston, and Longhurst, 2008). Sight, sound, and touch motivate participation in the dolphin-swim, with emphasis on making eye contact and getting close enough to touch, photograph, and/or see a dolphin (Wiener, 2013). The visual capture of the experience with recording devices (e.g., cameras, portable video devices, and selfie sticks) documents an immersion in the dolphin's natural environment (Berger, 1980). Video and photographic images serve as proof of the experience in order to meet other people's expectations (Lemelin, 2006).

Similar to Merchant (2011), this paper will explore bodily expression and engagement during in-ocean experiences. A wide range of in-water conduct is observed (see Table 15), but this paper will focus on three specific human behaviors that may indicate aggression towards the dolphins: diving, chasing and deliberate approach. These behaviors, while not indicative of intent to harm, often border on harassment of the wild dolphins, and we assess the effect of these human behaviors on the dolphins' response. Human snorkelers in the water with dolphins will be referred to as swimmers.

In this paper, we attempt to answer five questions:

1. Do aggressive swimmer behaviors influence dolphin behavior?
2. Is swimmer experience a predictor of aggressive behaviors during dolphin-swims?
3. Does the use of a hand-held camera increase aggressive behaviors during dolphin-swims?
4. How accurate are swimmers' perceptions of their own behaviors during the dolphin-swims?
5. How do swimmers interpret their dolphin-swim experience?

Through these questions, we aim to highlight what constitutes a successful experience from the swimmers' perspective, how proximity to dolphins influence the experience, and what intentions and/or actions, if any, does the experience of swimming with dolphins provoke in swimmers. We predicted that a pattern of behavior would emerge from human swimmers during dolphin interactions that reflected their individual perceptions influenced by expectation, previous experiences, and degree of connection with dolphins during the in-water experience. Our hypothesis was that swimmers with more dolphin experience with passion towards the dolphins would cause increased harm by "loving the dolphins" to the point of disturbance. To our knowledge, this study represents the first application of in-water video annotation and survey work for understanding human behavior during the swim and attitudes after dolphin-swim interactions.

2. Method

Observations consisted of in-water interactions between free-ranging Hawaiian spinner dolphins and boat-based dolphin-swim participants at two sites, Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island, over the course of one year. The selected locations serve as sites for wild Hawaiian spinner dolphin-swim tourism and have active harbors with many companies running dolphin tours. Data collection occurred at 14 known spinner dolphin resting-sites, spanning 257 boat hours distributed across 11 different dolphin tour companies (see Figure 14). Data were amassed from a self-administered questionnaire coupled with video-based behavioral observation from participants wearing cameras while on board dolphin-swim boat tours with willing operators. We randomly selected volunteer participants over the age of 18 to wear head-mounted GoPro® video cameras during in-water swim activities. Questionnaires were self-administered by the selected participants while on the boat going back to shore. The video data provided the opportunity to categorize and quantify the types of movements that people conduct while in the water with the Hawaiian spinner dolphins. In the following analysis and discussion, a dolphin-swim encounter is defined as a swim with one or more dolphins in a visual range underwater for five seconds or more (Scheer, 2010). Video-wearing participants gave written consent before getting on the boat, and the GoPro® cameras recorded video for the entire dolphin-swim session. All research protocols adhered to the standards of the Canadian Tri-Council Research Ethics guidelines.

2.1 Video collection and in-water assessments

An ethogram is a description or inventory of behavior pattern characteristics of a particular species that is gathered from direct observation (Lehner, 1979). Traditionally, ethograms are used on non-human animals; however, for the purposes of this research the ethogram method was applied to human swimmers. Video provides rich records of interactional phenomena, helping to identify patterns, including eye contact, bodily gesture, and human-dolphin body positioning (Barron, 2006; Derry et al., 2010). Observation of swimmers was continuous from initial approach of the dolphins until they left or the boat departed from the dolphins. The number of boats, swimmers, other recreationists (e.g., stand-up paddle-boarders), and dolphins were counted during this time. Over 85 hours of video footage were coded for human behaviors, position and estimated distance from dolphins and 564 encounters were characterized from 208 participants. Multiple swims occurred during the same excursion and more than one video recording per person was considered. Analysis began from the initial video frame of footage that contained one or more dolphin(s) and extended 15 minutes into the video to synchronize swim times. This time was selected as it was the shortest video recorded, ensuring that all videos were analyzed with equal time.

2.2 Participant observations

As swimmer behavior can change due to camera presence, we conducted above-water focal follow of swimmers with and without the video cameras. Focal follows were conducted by anonymously video recording selected swimmers for the duration of their time in the water. Individual focal follows, as opposed to group scans, were selected as it

provides more observer reliability (Altmann, 1974). Boat-based observation of participants wearing head-mounted cameras was compared to those without (the control group) to determine the impact of the camera on swimmer behavior. A chi-square test of statistical significant difference showed that there is no statistically significant change in the frequency of chasing ($\chi^2 (1, n = 264), p= 0.61$), diving ($\chi^2 (1, n = 264), p=0.90$), or deliberate approach ($\chi^2 (1, n = 264), p=0.90$) due to the presence of the camera.

2.3 Video coding and coder reliability

A content log with time-indexed events allowed for macro-level coding of video footage. A three-minute point-sampling interval was determined to scan for the number of dolphins and swimmers in the frame, categorizing and quantifying a pre-established coding scheme of human behaviors towards the dolphins (see Table 12). Distance from swimmer to dolphins was also analyzed using a scale of body length estimates ranging from 0-21 ft. (0-6 m). These measurements were later calibrated using the average spinner dolphin body length obtained from prior dolphin stranding data (Main Hawaiian Islands Stranding Network, 2008-2010). Dolphin behaviors were categorized using previous study classifications by Christiansen, Lusseau, Stensland, and Berggren (2010), Constantine (2001), Constantine and Baker (1997), Danil et al. (2005), Pack (2009), and Scheer (2010). To ensure accuracy of behavior categorization, four different student intern coders were asked to observe video footage.

Table 12. Video codes for selected dolphin and human behaviors.

Dolphin Behavior	Human Behavior
Aerial Activity (dolphin jumps out of water or extends at least half of its body vertically above water)	Arm Movement (arms outstretched towards dolphin)
Fast Travel (dolphin swimming at an accelerated pace)	Camera (using underwater video/photo)
Skirting (dolphin actively swims away/ in different direction to avoid human swimmers)	Chasing (swimmer quickens pace in an obvious manner following dolphin)
Slow Travel/Rest Formation (dolphin swimming across screen at a slow pace and/or in resting formation)	Deliberate Approach (swimmer changes direction/ moves toward dolphin)
Breath at Surface (dolphin moves to surface to take a breath)	Diving (swimmer swims downward or dives deeper)
Bubble Stream (bubbles are produced in a stream from the blowhole)	Floating (swimmer does not move and rests at surface of water)
Head Nod (head/rostrum move in a vertical/horizontal position)	Making Noise (swimmer creates intentional noise using objects/voice)
Jaw Clap (jaws open/close abruptly)	Swimming (swimmer is engaged in consistent movement)

Inter-coder reliability was measured on 318 observations using Krippendorff's alpha (α). Krippendorff's alpha was selected because it can be used with multiple coders and can account for ordinal, interval, and ratio level variables (Hayes and Krippendorff, 2007; Hallgren, 2012). Reliability using this test is assumed at a minimum of $\alpha = 0.67$, which takes into account expected and observed disagreement (Krippendorff, 2011). Reliability for this study ranged from $\alpha=0.77$ to $\alpha=0.81$ and behaviors were only considered when all coders were in agreement. Post-swim surveys were linked to the participant's video so that attitudes and demographics could be compared with in-water behavior.

2.4 Dolphin-swim participant survey and follow up survey

A self-completed written survey was disseminated to those participants who consented to wear the video cameras immediately following the dolphin-swim activity. The survey instrument contained four sections consisting of themes relating to prior dolphin-swim

experiences, attitudes about wild dolphin-swims, attitudes towards dolphin management, and swimmer demographics including age, gender, and participants' country/residence (see Appendix C). Questions explored experiential and sensory memories, behavioral experience, emotional experience, and reflection. Attitudes towards the dolphin-swim experience can change over time and, as a result, a second post-swim survey was distributed three months later through email to assess the stability of opinions following dolphin-swim participation (see Appendix D). Participants who returned both surveys were given a digital copy of their video-recorded dolphin-swim to encourage participation. Both the post-swim and follow-up surveys were pre-tested with a pilot group of 14 experts. A total of 208 surveys and 143 follow up surveys were completed, providing a 69% follow-up response rate.

2.5 Data analysis

The Statistical Package for the Social Sciences SPSS (version 21.0) was used to complete descriptive and analytical statistics on both the video and survey data. Chi-square tests were used to explore the categorical behavior data and Mann-Whitney U tests were used to determine significance of relationships between specific behaviors. The dataset contains both continuous and categorical variables, some of which are not normally distributed.

3. Results

3.1 Demographics and experience level

Based on field observations of tour groups, more females than males participated in dolphin-swims; the study sample reflects these observations, with a higher female participant rate (59%) compared to males (40%) (see Table 13). The mean age of participants was 37.6 years of age, with over half of the swimmers' ranging between 26–45 years old. The majority were tourists on vacation (88%), with 80% planning to swim with dolphins in advance of their trip. Over half of the participants were first time swimmers with dolphins (68%), having basic or average experience snorkeling and being in the ocean (see Table 14). Only 24% ($n=49$) had also participated in an aquarium dolphin-swim one to three times prior to swimming with dolphins in the wild, and 17% ($n=24$) partook in an aquarium swim following their wild dolphin experience. After completing the wild dolphin-swim, 91% ($n=129$) of participants said they would do a wild dolphin-swim again.

Table 13. Descriptive demographics of participants.

	Count	Percent
(n=208)		
Gender		
Male	84	40%
Female	123	59%
Undescribed	1	1%
Age (Mean =40.8, SD =19.75)		
18-25	37	18%
26-35	60	29%
36-45	45	22%
46-60	53	25%
60+	9	4%
Status		
Resident	22	11%
Visitor	183	88%
Undescribed	3	1%

Table 14. Participant experience levels in the Ocean (n=208).

Being in the ocean			Snorkeling			Swimming with dolphins		
	Count	Percent		Count	Percent		Count	Percent
First time	5	2%	First time	24	11%	First time	143	68%
Basic	42	20%	Basic	68	33%	Basic	31	15%
Average	114	55%	Average	80	38%	Average	10	5%
Advanced	46	22%	Advanced	35	17%	Advanced	16	8%
Undescribed	1	1%	Undescribed	1	1%	Undescribed	8	4%

3.2 Human (swimmer) behavior

There was a statistically significant difference between study sites in the numbers of swimmers in the water at any one time ($t(856) = 11.52, p < .001$). In Wai‘anae, the average number of swimmers was 16.22, while Kailua-Kona had an average of 2.26. This difference was especially large considering the similar number of dolphins in both locations: 9.98 in Wai‘anae and 8.12 in Kailua-Kona. A bivariate correlation used to assess the relationship between the number of swimmers and dolphins ($r = -0.058, p = 0.169$) revealed that there was no statistically significant relationship. This may be explained by the dolphin’s preference for the shallow sandy habitat regardless of boat and human presence (Tyne, Johnston, Rankin, Loneragan, and Bejder, 2015). Swimmer estimates were also contrasted with the greatest number of dolphins observed in both the videos and daily boat counts. Swimmers consistently overestimated how many dolphins were in the water with them if they felt they could provide an estimate; 46% ($n=28$) of those surveyed had estimate discrepancies of 30 dolphins or more. For the swim group with the highest estimates of dolphins in the water, the average estimate was 47.4 dolphins.

In-water swimmer behaviors in the presence of dolphins consisted mostly of floating and swimming at the surface. While these passive behaviors occurred most frequently, aggressive behaviors accounted for almost a third (27%) of in-water human behavior. In this case, the term *aggressive* refers to the active pursuit of interaction by chasing, diving, or deliberate approach. There is no statistically significant relationship between gender

and behavior; however, more females engaged in chasing behaviors (79%) and more males were found diving (64%). Use of personal hand-held cameras occurred equally amongst females and males.

Table 15. Swimmer and dolphin behavior by island.

Swimmer Behavior	Wai‘anae, O‘ahu (n=750)	Kailua-Kona, Hawai‘i Island (n=838)	χ^2	p-value
Floating	400	277	65.83	<.001***
Swimming	337	366	.211	.646
Arm Movement	114	88	7.76	.005*
Camera Use	114	230	35.29	<.001***
Chasing	76	130	10.27	.001**
Deliberate Approach	37	94	20.78	<.001***
Diving	18	75	30.93	<.001***
Making Noise	17	54	16.26	<.001***
Dolphin Behavior				
Breath at surface	114	247	41.07	<.001***
Slow Travel	352	372	51.93	<.001***
Aerial Activity	47	27	1.07	.300
Body Contact	62	44	0.16	.686
Diving	5	25	12.24	<.001**
Fast Travel	64	49	0.12	.726
Skirting	47	34	2.99	.084

Note. Counts based on occurrences observed through video data on 3 minute intervals. Chi-square (χ^2) significant at the *p<.05 level. **p<.01 level. ***p<.001 level.

Human behavior varied by island with the exception of swimming, one of the most frequent behaviors (see Table 15). Operator behavior contributed to the differences between sites by impacting both boat and swimmer conduct in and on the water. Wai‘anae operators mostly used lifejackets and flotation devices with the swimmers, accounting for the increased floating and decreased diving, deliberate approach, and chasing. Personal camera use was popular at both sites, but a greater number of advanced swimmers were found in Kailua-Kona, which explains increased camera use and closer

swim distances. The higher level of noise-making in Kailua-Kona may be related to the greater number of spiritual swimmers, 44% ($n=30$) who were witnessed trying to connect with the dolphins verbally. On Hawai'i Island, a group of retreats exists that emphasize dolphin spirituality and healing through dolphin-swims, claiming a telepathic exchange with the dolphins. Given the apprehension of inexperienced swimmers, it is not surprising that experienced swimmers more frequently engage in aggressive behavior.

Table 16. Significant experienced dolphin swimmer behaviors

	<i>U</i>	<i>r</i>
Diving	179	0.56***
Use of Camera	233	0.26**
Chasing	236	0.23*

Note. Mann Whitney U Test (*U*) significant at the * $p<.05$ level. ** $p<.01$ level. *** $p<.001$ level.

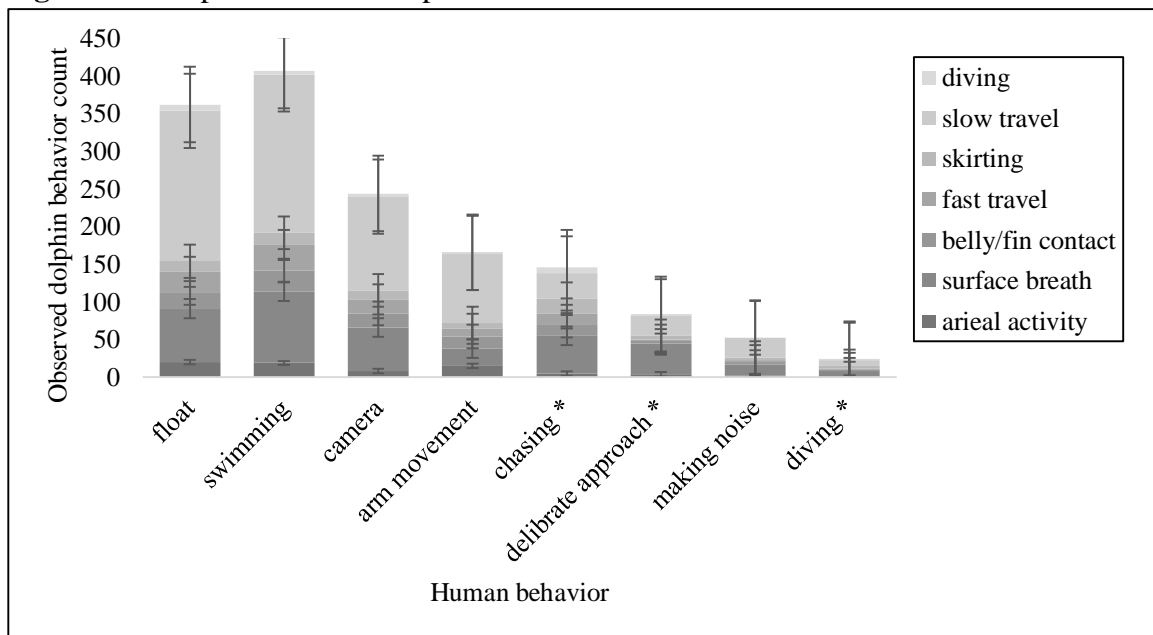
Swimmers with minimal ocean experience were more tentative in the water, not only contending with the anticipation of the dolphin encounter, but the act of being in the ocean. Some participants had never swum before or had very little ocean swimming experience (see Table 14), yet 22% ($n=47$) willingly jumped into the water. Of the advanced or experienced-dolphin swimmers, 8% ($n=16$) swam closer to the dolphins and frequently exhibited behavior deemed as aggressive. Diving, chasing, and the use of a camera increased significantly amongst advanced or experienced dolphin swimmers (see Table 16). Of these activities, the frequency of diving behavior differed the most significantly between experience level ($p<.001$). Camera use (including underwater cameras, videos and selfie sticks) was used by 71% ($n=147$) of swimmers. The relation between camera use and an increase in diving amongst swimmers was also significant. In

the follow up survey, 28% ($n=39$) of respondents said that getting photo and video of the experience was the most important component of the swim and over half 63% ($n=132$) indicated sharing their photos or videos to tell others about their experience.

3.3 Dolphin behavior

Observed dolphin behavior upon arrival in the bays consisted mostly of slow travel (55%) and breath at surface (31%) on both islands (see Table 15), indicating typical rest behavior (Norris, Wursig, Wells, and Wursig, 1994). In particular, diving, breath at surface, and skirting occurred more often than expected in the presence of aggressive human behaviors (see Figure 14). Dolphins also displayed skirting and fast travel when swimmers dove down or deliberately approached them, demonstrating that dolphins may avoid such aggressive behaviors.

Figure 14. Dolphin behavior response to in-water swimmer behavior distribution.



Note. Vertical lines indicate +/- 1 standard errors. * = aggressive human behaviors

During aggressive human behaviors, multiple dolphin behaviors occurred significantly more often than expected ($\chi^2 (72, n = 1583) = 118.64, p = <.001$); these dolphin behaviors varied by location (see Table 17). A significant increase in dolphins traveling fast was viewed in Wai‘anae and dolphin diving was significantly more frequent in Kailua-Kona. Breath at surface significantly increased and slow travel decreased in both Kailua-Kona and Wai‘anae when aggressive human behaviors were displayed (see Table 18). Dolphins demonstrated slow travel half of the time; this decreased during human chasing or deliberate approach, suggesting a divergence from normal behavior. Increased skirting and diving was also seen during swimmer chasing behavior and breath at surface was viewed frequently during chasing and deliberate approach behaviors.

Table 17. Dolphin behavior response to combined human aggression behaviors (diving, chasing, direct approach) by island.

Dolphin Behavior	Wai‘anae, O‘ahu		Kailua-Kona, Hawai‘i Is.	
	χ^2	P-value	χ^2	P-value
Breath at Surface	3.71	.054	30.18	<.001***
Slow Travel	17.16	<.001***	32.91	<.001***
Aerial Activity	.109	.741	.520	.471
Body Contact	.355	.551	.169	.681
Diving	3.66	.056	6.19	.013**
Fast Travel	6.24	.012**	2.09	.148
Skirting	2.31	.129	1.82	.177

Note. Chi-square (χ^2) significant at the * $p<.05$ level. ** $p<.01$ level. *** $p<.001$ level.

Table 18. Significant dolphin behavior response to human aggression behaviors.

Chasing					
	<i>Absence (n=1437)</i>		<i>Presence (n=145)</i>		(χ^2)
	Behav. Count	Percent Count	Behav. Count	Percent Count	
Breath at Surface	321	22.34	51	35.17	12.06*
Slow Travel	718	49.97	35	24.14	35.22**
Diving	22	1.53	8	5.52	11.25**
Skirting	63	4.39	19	13.10	20.38**
Deliberate Approach					
	<i>Absence (n=1497)</i>		<i>Presence (n=85)</i>		(χ^2)
	Behav. Count	Percent Count	Behav. Count	Percent Count	
Breath at Surface	330	22.04	42	49.41	33.50**
Slow Travel	727	48.56	26	30.59	10.42*
Diving	27	1.80	3	3.53	1.29
Skirting	77	5.14	5	5.88	.089
Diving					
	<i>Absence (n=1558)</i>		<i>Presence (n=24)</i>		(χ^2)
	Behav. Count	Percent Count	Behav. Count	Percent Count	
Breath at Surface	364	23.36	8	33.33	1.31
Slow Travel	745	47.82	8	33.33	1.99
Diving	29	1.86	1	4.17	.68
Skirting	79	5.07	3	12.5	2.66

Note. Chi-square (χ^2) significant at the *p=.001 level. **p<.001 level.

3.4 Swimmer distance



Figure 15. Female swimmers engaging in close snorkeling and diving with spinner dolphins in Kailua-Kona. (Credit: C. Wiener).

An estimated distance comparison between swimmers and dolphins did not differ by site. Distance estimates from video counts showed the majority of swimmers, 80% ($n=1267$), kept an estimated distance of 14-21 ft. from the dolphins with less than 1% ($n= 6$) getting

within reaching distance (0-3 ft.) and 2% ($n=26$) swimming within 4-6 ft. All swimmers who achieved reaching distance were female (see Figure 15) and only chasing behavior significantly increased when swimmers came within six feet of a dolphin.

Over half of the survey participants 58% ($n=120$) claimed to maintain an appropriate distance from the dolphins; this remained consistent with the observed behaviors in the videos. Swimmers observed getting closer to the dolphins also reported closer distance on the survey, with high reliability using Krippendorff's alpha ($\alpha = 0.85$). Surprisingly, swimmer enjoyment and distance from dolphins did not correlate. Those who reported getting close to the dolphins felt that the dolphins were in near proximity because they wanted to be. These beliefs conflict, however, with the fact that the median frequency for chasing significantly increased in those who reported not maintaining their distance from the dolphins ($U = 1,502.5$, $p = .044$, $r = .53$) compared with swimmers who did report maintaining their distance. If the dolphins truly wanted to be in close proximity to humans, then chasing would not be necessary.

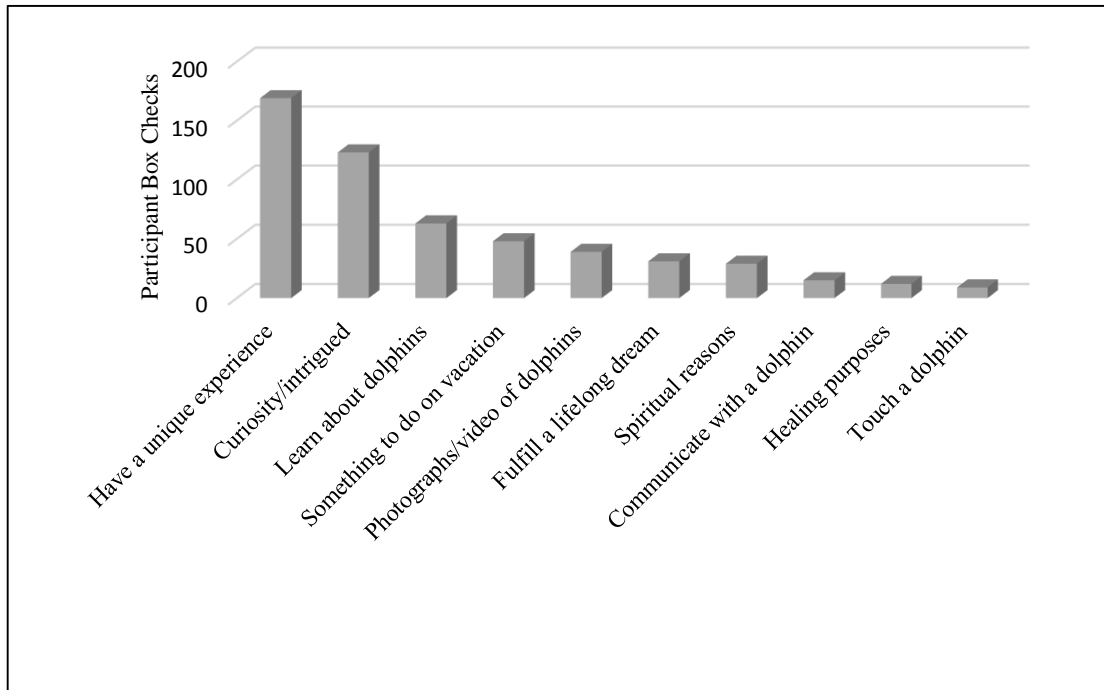
In Kailua-Kona, operators recognized certain dolphins who seemed to swim with the group on a regular basis; this was not the case in Wai'anae. The Kailua-Kona dolphins had easily recognizable features such as notches in their dorsal, obvious scars, etc. and, as a result, were sought out more frequently by operators. These recognizable dolphins were observed interacting more closely with swimmers on a frequent basis. When dolphins exhibited resting behavior and were less interactive, participants were observed complaining of being disappointed that the dolphins did not seem to be interested.

Following the dolphin-swim, participants discussed how close they got to the dolphins, comparing swimming distance and how they thought the dolphins appeared in their pictures or videos. These informal observations underscore the importance of photo documentation and sharing the experience, even immediately following the swim.

3.5 Swimmer attitudes towards the dolphins

Swimmers' reasons for wanting to interact with the dolphins included 81% ($n=169$) looking for a unique experience, 59% ($n=123$) curiosity, and 7% ($n=15$) desiring direct contact with a dolphin. Other reasons included spiritual or healing purposes, to learn more about dolphins, something to do on vacation, and to fulfill a lifelong dream (see Figure 16). This differed from participant responses on what made the experience memorable, which included emotional excitement, collecting photographs or video, and the intimacy of direct interactions with dolphins. Over half of respondents, 60% ($n=125$), said that being in the water with the dolphins was enough to make it memorable, while another 30% ($n=62$) cited touching or making eye contact with the dolphins necessary to make it a noteworthy experience. Participants also reported that the dolphins needed to be aware of them and acknowledge their existence. Less than 5% of swimmers ($n=10$) reported that seeing dolphins from the boat or learning about them was enough to make the experience memorable; however, 76% ($n=158$) of swimmers would still participate in a dolphin tour if they could not get in the water with a dolphin.

Figure 16. Swimmer reasons for participating in a dolphin-swim ($n=208$).



Attitudes remained somewhat consistent three months after the dolphin-swims; 85% ($n=117$) of the follow-up respondents said that they felt the same way as they did when they finished the activity. This was also reflected in the lack of difference between the post-swim and follow-up survey three months later. Participants who had completed both surveys were reliable on their reported behavior (69%), attitudes about the swim (64%), and dolphin proximity (58%). Although swimmers described their behaviors fairly accurately, expectations for the dolphin-swim remained disconnected from what actually occurred. Those who had either heard about other swimmers' experiences, viewed advertisements, or participated in aquarium swims expected a "close-up" encounter with a wild dolphin. Even before arriving, the anticipation of the experience is one constructed by media, advertising, and word of mouth. In reality, the majority of swimmers did not

have the experience or skill set to get close enough to the dolphins to achieve what they anticipated.

Many swimmers expressed excitement about viewing the dolphins from a shared environment, providing them with a greater understanding and respect of the dolphins. They liked that the dolphins could come and go as they pleased. One respondent stated, “The two pods of dolphins we encountered were happy to swim around the group, which allowed us to watch them interact with each other.” A smaller subset of snorkelers had trouble connecting with the dolphins in the water. One respondent stated, “I was surprised that my interaction did not lead to bonding with the dolphins. The water was deep, there were a lot of other boats and people to be aware of. I am happy that I did it, but would like to do it again in a more intimate, calmer setting.”

3.6 Swimmer spirituality and healing

Seventeen percent of swimmers ($n=34$) felt that swimming with dolphins was a spiritual experience. Of this group, the majority was based in Kailua-Kona and all were female. Upon completion of a dolphin-swim, the number of swimmers classifying the swim as a spiritual experience increased to 25% ($n=50$). One participant said, “It is quite an experience on a spiritual level if you are open to it. To be able to watch the dolphins glide effortlessly through the water and see them interact with one another was just indescribable.” The behavior of swimmers who felt that the experience was spiritual did not significantly differ from those who did not attach spirituality to the dolphin-swim.

However, chasing ($\chi^2 (14, n=122) = 26.02, p= .026$) and making noise ($\chi^2 (8, n=122) = 23.17, p= .003$) were significant behaviors among individuals who reported partaking in the dolphin-swim for healing reasons. The higher participation of swimmers for healing purposes in Kailua-Kona likely accounts for the difference in noise-making between the two islands. Informal conversations with swimmers seeking healing indicated that they needed to vocally communicate and get close to the dolphins to receive therapeutic benefits. One participant said, “I have chronic kidney disease and am awaiting transplant. My husband thought the dolphins were surrounding me because they sensed my illness. I called out to them and we sang together, it was truly a magical moment.”

3.7 Conservation implications

Only 11% ($n=23$) of swimmers expressed concern about their impact on the dolphins and just 18% ($n=37$) thought that the swims affected the dolphins’ ability to sleep, indicating a lack of understanding about how dolphin-swims potentially affect these particular dolphin populations. One swimmer stated that the swim “made me pause and think about the consequences of my actions.” Most participants 63% ($n=92$) were also unsatisfied or had no understanding of the current policies in place for protecting the dolphins. Less than one third of all participants knew about the Marine Mammal Protection Act or if swimming with dolphins was a violation of the regulations. Three months following the swim, the number of participants who felt that the dolphins were in danger from the swims increased to 42% ($n=60$) from 11% ($n=23$) directly after the activity. Despite this, almost all participants (92%, $n=192$) plan on swimming with dolphins again and 7.3%

($n=15$) would still swim with them even if the participants knew it could harm the dolphins. A common attitude was “since the dolphins did not look bothered, they were not endangered.” One swimmer exemplified this attitude by stating, “If the dolphins did not want to interact with humans, they would swim away - I found it to be a positive experience as they chose to swim very close to us and did not seem at all disturbed.”

Immediately following the dolphin-swim, 93% ($n=194$) of swimmers claimed they would support or participate in marine conservation related to the dolphins. Three months later, 78% ($n=113$) said that they had learned more about the dolphins since the swim; however, this was not a high priority for the swimmers. Only 14% ($n=21$) maintained that their personal values changed due to the swim, and 13% ($n= 19$) had supported dolphin conservation or volunteered three months later. Other studies, such as Curtin (2006), witnessed fading enthusiasm for engaging in marine conservation following participation in the actual dolphin tour activity.

4. Discussion

Dolphin-swim tourism in Hawai‘i occurs primarily in shallow bays that serve as critical habitat for Hawaiian spinner dolphins. Suitable resting habitat is scarce, which means the dolphins do not have a choice in swim tour participation. Results show that human conduct during swim tours may cause the dolphins to deviate from typical rest behaviors while in their preferred habitat. These findings highlight the need for tour companies and regulatory agencies to revisit the content of guidelines for swimmers who enter the water

with wild dolphins. Enhanced enforcement of stricter rules can help to ensure safety and rest for the dolphins in the bays.

A number of factors contribute to aggressive human activities that impact dolphin behavior. Tour guides were observed focusing on less experienced swimmers, which allowed more advanced swimmers increased freedom to pursue the dolphins. Typically, one in-water guide was responsible for up to 30 people at a time and mostly focused on participants who did not have any swimming abilities. Inexperienced swimmers spent most of their time floating, adjusting to the water, and looking for the dolphins. Guides continually reminded people to put their face in the water to see the dolphins below them, but new snorkelers were still confused and apprehensive about submerging their face.

Another important factor is the anthropocentric mentality articulated by guides, swimmers, and captains, in which dolphin behavior gets translated into human terms. Frequently, participants “observed” how “happy” the dolphins were interacting with the swimmers. For example, one participant stated, “one of the dolphins swam straight towards me and checked out who I was and what I was doing here. I could hear it talk to me.” Swimmers’ behavior toward dolphins and feelings about the swim were impacted by assumptions that dolphins’ presence meant the animals were happy, and misconstrued .negative dolphin response as a positive interaction. Often, this resulted from wanting to feel acknowledged by the dolphins and participants placed great emphasis on establishing social bonds. Creating a connection with an individual dolphin was an important focal point of the swim, particularly for those more experienced or those swimming for healing

and spiritual reasons. Participants often identified eye contact as a pinnacle of the swim experience and a way to feel acknowledged by the dolphins. These feelings and attitudes motivated swimmers to pursue the dolphins in hopes of creating a connection.

Swimmers frequently exhibited the need to document the dolphin-swim experience. In both the post-swim and three-month follow-up surveys, participants remained focused on the videos and photos they collected during the swim that were used as a vehicle to share their experience with others. Those who felt like they did not get clear, up-close imagery carried this disappointment and wanted to repeat the swim in order to adequately capture it on film. Participants who collected up-close shots felt encouraged to pursue better imagery with other dolphins in different locations. In this regard, the photos and videos acted as the trophies of the experience (Warkentin, 2007). As a consequence, the participants with personal cameras and video recorders pursued the dolphins more aggressively in order to capture closer views of the animals.

There were frequent instances of people getting kicked by other participants and of experienced swimmers going great distances away from the boat, becoming so focused on the dolphins that they lost awareness of their surroundings. These behaviors are not malicious; however, experienced swimmers are more likely to have the ability to get close to the dolphins or engage in play. If in-water swimming continues, results suggest that imposing rules to minimize aggressive swimming behavior may mitigate the negative impact of dolphin-swim tourism on the dolphins themselves. Requiring participants to wear floatation devices can prevent diving after dolphins and keeping

swimmers close to the tour boat, while banning extended camera poles or “selfie sticks” can discourage aggressive pursuit of the dolphins during the swim. Thus, effective guidelines should focus on experienced swimmers, as inexperienced swimmers are not likely to be affected by the guidelines, nor are they likely to affect dolphin behavior.

Ultimately, swimmers’ experiences were mostly positive and participant surveys indicate a desire to continue swimming with dolphins. Demand for wild dolphin-swim encounters will continue to grow as positive interactions drive return customers and shared experiences recruit first-time participants. The expansion of tour companies and increasing swimmer participation will further exacerbate the issues of regulating in-water swimmers. The significant increase in non-resting dolphin behavior in response to aggressive in-water human activity merits a change in rules and increased enforcement.

Improved monitoring with patrol boats and severe fines may build adherence to the laws governing dolphin-swim tourism, but resource limitations make this difficult in practice. One way to circumvent narrow resources is to impose a fee for participation that contributes to enforcement and conservation. Many other countries with governmental oversight of the dolphin-swim industry, such as Australia and New Zealand, have implemented stricter regulations with mandatory towlines and boat permit limits (Valentine, Birtles, Curnock, and Dunstan, 2004).

Both Wai‘anae and Kailua-Kona have large numbers of dolphin-swim participants, but observations and swimmer behavior demonstrate that the tour industry operates

differently in the two locations. The variance between islands should be considered when drafting regulations, as location-specific characteristics of the tour companies have implications for how well regulations will be accepted within the individual communities.

6. Conditions and caveats

This study provides an examination of in-water dolphin-swim behavior and participant attitudes associated with dolphin-swim tourism in Hawai'i; however, it is constrained by financial, time, and geographic limitations. Not all commercial dolphin-swim and viewing operators were included, ignoring other commercial or private entities that interact with dolphins both directly and unintentionally. Other participants such as non-English speaking swimmers were not included in the study due to a lack of translation resources; therefore, it is recommended that another study be conducted on other large non-English speaking demographics. Additionally, the research does not address an important subset of the population who choose not to participate in dolphin tourism at all. Although there was no significant difference found between the swimmers' wearing the head-mounted cameras and those who did not, this research and the researcher's presence on the boat may have had an observer effect on the participants. The data produced should therefore be considered inferential and further in-water study should be conducted.

7. Conclusion

This research provides a detailed description of the behaviors displayed by human participants and dolphins during a wild dolphin-swim encounter, as well as the

participants' experience after the swim. The data confirm the hypothesis that more experienced swimmers cause increased disturbance to the dolphins with aggressive in-water behaviors, including diving, chasing, and deliberate approach towards the dolphins. Aggressive human behaviors also increased with those focused on the spiritual or healing aspect of the swim, and with the use of a camera in the water. Aggressive swimmer behaviors coincided with dolphin behaviors not typically seen during resting hours, such as increased breath at surface, decreased slow travel, and increasing diving and skirting. Even though aggressive swimmer conduct is not generally indicative of malicious intent, the observed dolphin behavior suggests that these human behaviors may be classified as harassment of the wild dolphins. Swimmers' attitudes imply that any harassment experienced by the dolphins is unintended; however, swimmers did display an accurate perception of their interaction with the dolphins in terms of proximity and behavior engagement. Despite complaints of crowding, participants were enthused by the experience and plan to participate in future swims.

Increasing popularity and planned repetition of dolphin-swim activities warrant further regulation and enforcement of guides, including how they manage participant behavior and the logistics of coordinating boats and swims involving multiple guides and companies. Like Higham et al. (2015), the authors of this paper believe that dolphin-swim tourism should be managed as a consumptive activity, because of the potential impact that swimmers may have on dolphin behavior during critical rest times. Protecting the dolphins requires stricter regulations and enforcement of the swimmers, as well as the

Hawaiian dolphin-swim industry as a whole. Substantial differences between industry practices between islands warrant treating each location separately, with location-specific management policies and enforcement strategies.

Chapter 7: Conclusion

The emergence of dolphins in mainstream, popular culture as intelligent, emotional, and even spiritual creatures motivates people to seek out in-person interaction with dolphins. In the past, the vast majority of human-dolphin social interactions occurred in controlled, artificial environments. The advent of the wild dolphin-swim industry changed the course of this relationship, and over the last forty years there has been an explosion in the number of tour companies that offer “swimming with dolphins” (Wiener, 2015). These businesses provide tourists with the unique opportunity to safely interact and perhaps connect with these wild animals in the dolphins’ ocean “home.” The ocean is already a foreign place for most people and the feeling of floating in the presence of wild dolphins stimulates the senses in unfamiliar ways that can create an emotional and, in some cases, once-in-a-lifetime experience. Being in the water with large aquatic animals feels highly unusual for most people (Sweeny, 2009) and the appeal of swimming with dolphins is not likely to fade, even with the implementation of new and more restrictive regulations. The primary components of peak dolphin-swim experiences identified in this work include proximity to the animals, immersion in their habitat, and acknowledgement of the individual by the dolphins. If regulations ban in-water interactions, how will wild dolphin encounters change for participants and for the dolphins? Will demand for the experience alter? How will local economies be affected? It is essential to take a holistic approach to implementing rule changes and examine how shifts in regulation will affect swimmers, community stakeholders, and the dolphins themselves.

Summary of findings

The dolphin-swim industry in Hawai‘i serves as a case study to demonstrate the impact of this activity on dolphin populations, local economies, and human communities. Prior to this study, previous research explored mostly the biological aspects of dolphin-swims, as illustrated in Chapter 3. Results from this case study offer a baseline for stakeholder attitudes and establish methods for assessing the monetary value of dolphin-swim businesses, as well as the in-water, behavioral interactions between swimmers and dolphins. From experienced swimmers who unknowingly demonstrate aggressive behavior to the frustrated community members, to operators who rely on the dolphins for their livelihood, all involved in this industry bring their own experiences with the dolphins, yet, despite obvious self-interests, most people demonstrate a care and consideration for the species.

Chapter 4 focuses on commercial and community attitudes towards dolphin-swim tourism in Hawai‘i and demonstrates that commercial stakeholders have diverse perspectives regarding the most effective approach to managing the industry. Those based in Kailua-Kona on Hawai‘i Island indicated a preference for no governmental management and favored community-based initiatives. In contrast, Wai‘anae, O‘ahu tour operators were more open to regulation, especially increased enforcement and education. These preferences may be due to the smaller number of tour operators who have been running businesses for a shorter time than the Kailua-Kona companies. Community interviewees demonstrated fewer differences compared with the commercial

stakeholders; however, diversity did exist among the community participants' attitudes. For example, those in the Kailua-Kona dolphin-swim community believe they are not impacting the dolphins because the dolphins choose to participate in the encounters. Dolphin-swimmers in Kailua-Kona have a strong spiritual connection with the dolphins and seem to be more outspoken about the freedom to swim with them. Additionally, the people in Kailua-Kona live much closer to the dolphin bays and those opposed to the swimming practices are faced with issues on a daily basis.

Chapter 5 provides an economic valuation and analysis of the Hawaiian dolphin-swim industry. In total, the two islands generate more than \$100 million USD in annual wild-dolphin tourism revenue, which suggests that the economic importance of the activity is underappreciated on both islands. Businesses in Wai'anae generate more revenue than those in Kailua-Kona, even though the former have about one third the number of boats. Differences in boat size, tour frequency, tourist participation, operator practices, and ticket costs all contribute to the island dissimilarity. Economic contributions are not the only consideration when assessing dolphins' worth; ecological, sociocultural and intrinsic values all play an important role in the use and non-use values of the species. These components are explored both in Chapters 4 and 6.

Chapter 6 offers a detailed description of the behaviors displayed by human participants and dolphins during a wild dolphin-swim encounter as well as the participants' experience after the swim. This analysis binds the information presented in previous

chapters to tangible activity in the industry by providing insight into tourist behavior and attitudes that drive the economics via return participation and interaction with the local community. The data show that experienced swimmers, swimmers with hand-held cameras, and those focused on spiritual or healing aspects trigger increased disturbance to the dolphins with aggressive in-water behaviors such as diving, chasing, and deliberate approach. Aggressive swimmer behaviors coincided with dolphin behaviors not typically seen during resting hours, such as increased breath at surface, decreased slow travel, and increased diving and skirting. It is not yet clear how or if these changes in dolphin behavior will have long-term effects on the dolphin population. Similar to the other components of this work, the frequency of multiple swimmer behaviors differed significantly between the tours in Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island. These divergences most likely result from the business model differences outlined in Chapter 5, as well as tour operator-defined rules, such as life-jacket requirements. Not surprisingly, the variation in human behavior coincided with differences in dolphin behavior as well. For example, diving and increased breath at surface occurred significantly more often in Kailua-Kona, whereas fast travel occurred significantly more in Wai‘anae.

Each of the above chapters provides new insight into individual components of the Hawaiian dolphin-swim industry, but, the results should be considered as a whole. Swimmer survey responses and stakeholder interviews demonstrate that while advanced swimmers may be more aggressive in their behaviors, they care for the dolphins and are

not intentionally harassing the animals. In addition, those conducting or guiding swims truly believe that they are not impacting dolphin behavior, but acknowledge the potential for negative impact due to an ever-increasing number of dolphin-swim participants. The surveys also illustrate that experienced swimmers are likely to return or participate in additional swims. This implies that the number of advanced dolphin-swimmers in the participant pool will continue to grow, leading to potentially increased harassment of the dolphins. Interestingly, interviewees felt that participants would return for dolphin-swims even if people could not get in the water. The analysis in Chapter 5 supports these opinions by revealing that dolphin watching activities were shown to bring in more money than dolphin swimming. On the other hand, 60% of survey participants in Chapter 6 indicated a preference for in-water interactions, and the greater economic impact of dolphin watching may simply result from the larger boat sizes in O‘ahu. When considered in totality, these results give reasonable doubt that banning in-water dolphin-swims will have zero economic impact due to participants and operators migrating to dolphin watching. Despite the substantial differences between islands, commercial and community interviewees from both locations expressed frustration with unregulated growth and a belief that the industry has reached capacity. This mutual consent provides a basis for discussions about regulation to protect the dolphins and communities from unsustainable growth.

Recommendations for managers

All marine tourism industries in Hawai‘i – not just dolphin-swims – create conflict due to lack of regulation and general oversight of the ecosystem. These issues extend to scuba diving with manta rays, swimming with sharks, and whale watching. As the popularity and revenues of these activities increase, stress on the species intensifies, which in turn leads to amplified conflict amongst the commercial and community stakeholders. Historical mistrust of both state and federal governments has made the implementation of regulations difficult despite the reported commercial expansion. The lessons learned from this research have widespread implications for wildlife tourism in Hawai‘i and around the globe. Each chapter in this dissertation elucidates a different component of the dolphin-swim industry that policy makers and managers must consider in order to effectively regulate dolphin tourism. These components cannot be considered in isolation, as each feeds back on the others.

Many islands and coastal communities with dolphin populations do not take part in dolphin-swim tourism, but they have the potential to host such businesses. For example, Guam has a local spinner dolphin population, a dedicated tourism industry, and several dolphin-watching businesses that have contemplated moving towards an in-water swim model. Using the results from Hawai‘i presented here, other locations may be able to mitigate conflict and stress on local dolphin populations by implementing the recommendations offered below and considering regulation and management from the beginning. This will not only help to better integrate the businesses into the community, but also to provide a safer environment for both participants and the dolphins.

Specifically, the substantial differences between the two Hawai'i locations highlight the necessity of including each individual group in the negotiations surrounding how people can interact with wild dolphins. With a clearer understanding of local stakeholder relationships, managers can better focus their regulations and support tour operators and communities with more conservation-minded practices.

Location-based regulation



Figure 17. Many operators in Wai‘anae, O‘ahu already require dolphin-swim participants to wear flotation devices and have an in-water guide. Image credit C. Wiener.

A recurring theme throughout this dissertation is the fundamental difference between the dolphin-swim industries in Wai‘anae, O‘ahu and Kailua-Kona, Hawai‘i Island. Despite being separated by less than 163 nautical miles, the two locations differ in business models, dolphin and swimmer behavior, and the attitudes of participants and community members. Kailua-Kona has offered dolphin-swims for almost twice as long as Wai‘anae; Chapters 4 and 6 illustrate how length of time in the industry has created variance

between islands. In Kailua-Kona, more residents engage in dolphin-swims and the dolphins in Kona appear more habituated based on their interactions with swimmers. Wai‘anae community interviewees observed more changes in the dolphins and operators implemented more oversight on dolphin-swim tour participants. A potential consequence of the enhanced oversight may be the reduced frequency of aggressive swimmer behavior in Wai‘anae observed in Chapter 6.

Managers must consider variation in human attitudes and dolphin behavior when implementing new regulations as the effectiveness of specific rules may differ between communities. For example, the commercial and community groups in Wai‘anae seem to have a greater acceptance of rule changes than those in Kailua-Kona and, as a result, it may be easier to implement changes in Wai‘anae first. Additionally, policy makers will need to consider rules for shore swimming in Kailua-Kona and not necessarily Wai‘anae; however, this could change if new regulations ban boat-based swims.

Inclusion of shore-based swimmers

In Chapter 6, surveys of dolphin swimmers indicated the uniqueness of the experience as the primary reason for participation in dolphin-swims. If participants are no longer able to interact with dolphins in the water, will tourists decide to go to other locations that allow this activity? Perhaps, but those who wish to swim with dolphins may simply decide to circumvent the tour companies altogether. In some areas, including certain bays in Hawai‘i, it is possible to interact with dolphins by swimming, stand-up paddling, or kayaking from shore (see Figure 18). Not only would a shift to this type of private

activity negatively impact commercial revenue generation from the swims, but such a shift could also negatively impact the dolphin populations by allowing participants to get close to the dolphins without any supervision.



Figure 18. Stand-up paddle boarder viewing dolphins in Wai‘anae, O‘ahu. Image credit C. Wiener.

The behavioral analysis in Chapter 6 showed that experienced swimmers were more likely to participate in aggressive behaviors associated with increased occurrence of non-resting dolphin behaviors. Since experienced swimmers are more likely to swim from shore, a shift towards unregulated shore swims may lead to greater harassment of the dolphins. The south bays along the Kona coast already have existing residents who swim daily to interact with the dolphins. Tourists and visitors have begun to participate in this practice, but currently this is limited to Kona. If dolphin-swim boats are banned, shore-based swimmers could increase in other locations, causing a surge in the amount of people interacting from shore without any monitoring. One positive aspect of boat-based operations is that a guide typically enters the water with participants or, if not, the boat

captain at least monitors the swimmers. New rules should not only apply to tour boats, as shore-based swimmers may represent a greater nuisance for the dolphins. Standardized information should be given to tourists through required speeches given by tour operators and increased signage in the dolphin-swim bays.

Coordination and training of tour boats



Figure 19. Typically there will not be more than a few boats with the dolphins at the same time in Wai'anae, O'ahu. Image credit C. Wiener.

More than half of the boat-based swim participants stated they would join a dolphin tour even if they could not get in the water. As the number of boats offering dolphin-swims grows, a standardized training course for operators might ensure that the proper information is passed on to participants. If in-water dolphin-swims become outlawed, it will still be important to avoid crowding of the small dolphin bays by providing formal training for tour operators and a cap on the number of boats allowed. The latter will

require coordination between commercial operators. On O‘ahu, some cooperation exists amongst tour operators to avoid having all the boats with the dolphins at the same time (see Figure 19). This type of coordination will need to be expanded to other areas, as it is not frequently seen in Hawai‘i Island.

Citizen-based science



Figure 20. Tour operators and swimmers viewing and interacting with the dolphins on a daily basis can be used as a resource for collecting important life history and human interactions data. Image credit C. Wiener.

Large groups of commercial and community stakeholders on both islands interact with the spinner dolphins on a daily basis. These people know the dolphins and have a deep understanding of their behaviors and patterns (see Figure 20). Managers can utilize these groups to better understand the spinner dolphin populations by creating citizen science projects to collect data and document population changes. Currently, population estimates – particularly for O‘ahu – are outdated. Operators and swimmers could help acquire data describing dolphin encounters utilizing the methods established in Chapter 6. Such data could enhance knowledge and monitor the growing number of boats and people

interacting with the dolphins in the water. Collecting data pre- and post-regulation would help to engage the community and provide critical information to managers about the success and/or shortcomings of new rules. Similarly, having operators collect and share financial data via the methods used in Chapter 5 would contribute to better valuation of the industry and help identify potential sources of revenue to fund enforcement of regulations. Resource managers should work closely with the dolphin tourism stakeholders to optimally integrate conservation and regulation into local business models.

Insights from methods

The research methods developed for this dissertation provides a novel approach to investigating unstructured, in-water human-dolphin relations. According to Abram (1996) and Livingston (1994), extraordinary insights can result from examining coupled human-environmental systems from different vantage points, allowing the researcher to better perceive relationships across boundaries and between worlds. Investigating the in-water characteristics of dolphin-swims produces an interspecies phenomenology and hence epistemology that increases collaborative human-animal research in the biological and social sciences.

The inclusion of phenomenology and ethology places emphasis and value on the experience of both the human participant and the nonhuman species. Not only does this provide a new breadth of perspective, but it also creates a unique consideration of all participants or actors on equal levels. Focusing research on the experience of both

humans and dolphins assigns uniform value to living beings. This represents a necessary shift in researcher perspective that has yet to occur in many areas of conservation work. While the focus of this research is on the human behavior, the video footage collected could easily be used to better understand the underwater activity of wild dolphins, which has implications for future ecology work.

Due to limited resources, the three research components of this dissertation were compartmentalized and performed in chronological order beginning with interviews, followed by an economic valuation of the spinner dolphin-swim tourism industry, and concluding with dolphin-swim observations and participant surveys. The sequence of these methods was critical for informing the next phase of research, providing background and progressive understanding of the industry. Interviewees not only supplied data for the seasonal timelines and revenue estimates in Chapter 5, but also gave social context to the communities and operators, allowing for a deeper understanding of the issues surrounding the tours before going out on the water.

In future studies of this nature, it may be preferable to include a pre-swim survey to provide a baseline of participant's perceptions for comparison following the swim. Additionally, a 12-month follow-up survey could further demonstrate how likely swimmers are to continue participation in dolphin-swims, and if their participation indeed influenced any conservation-related behavior. The survey design could be enhanced by limiting the scope to just the in-water experience and re-formatting questions to produce consistent data types (e.g., ordinal, categorical, etc.) for statistical analysis. Including

more economic-focused questions in the interviews would lead to greater understanding of the dynamics between business and residential stakeholders. Inquiry regarding tour operator costs could provide a more accurate analysis of indirect costs and net profit in addition to the results concerning gross revenue detailed here.

Analyzing video from swimmers wearing head-mounted video cameras represents a new method in marine tourism and marine mammal research. This technique of observation proved successful, allowing for details of both swimmer and dolphin behavior to be witnessed under the water. Unexpected dolphin conduct was caught on film, providing rare opportunities to view group play, inter-species interactions⁵, and the ability to sex the dolphins. Sex identification is a missing component of many population studies that use mark-recapture or dorsal photo-ID, and this method of observation could help to identify and confirm sex ratios.

Other outcomes

Unfortunately, it has not been common practice to include human dimensions in biology-based marine mammal research. As a first step to encouraging more social science work in the field, this dissertation inspired a one-day workshop, *Breaching disciplines: Integrating marine mammal social-ecological research and management*, held in December, 2015 at the 21st Biennial Society of Marine Mammalogy Conference in San Francisco, California (see Figure 21). Presentations described research that incorporated biological and social science research, including the work shared here. The workshop

⁵ Two occurrences of two spotted dolphins (*Stenella attenuata*) interacting with a spinner dolphin pod were caught by head-mounted camera footage in Makako Bay, Hawaii Island.

brought marine mammal scientists together with managers and social science researchers to discuss better integration of human dimensions research with biological and ecological studies. The outcomes of the workshop were compiled and shared with the Society of Marine Mammalogy as recommendations for putting the theory of integration into praxis.



Figure 21. Workshop at the 21st Biennial Society of Marine Mammalogy Conference in San Francisco, California. Image credit C. Wiener.

Limitations to Study

This study attempts to provide a comprehensive examination of the human dimensions associated with dolphin-swim tourism in Hawai'i; however, it was constrained by financial, time, and geographical limitations. Targeting commercial dolphin-swim operators provides a limited scope, ignoring other commercial or private entities that interact with dolphins both directly and unintentionally. The analysis focused on two particular locations and may not be applicable to all other dolphin-swim regions given the localized customs and policies of the study sites. Even within the specified sites in

Hawai‘i, not all stakeholders have been targeted (e.g., Japanese-speaking tourists who do not understand English). This research does not address an important subset of the population that selects captive, non-swim encounters over wild dolphin-swims, nor does it address the attitudes and perceptions of those who choose not to participate in dolphin tourism at all. Including these demographics is essential for future work. The research is limited in its scope to participating operators and does not account for every tour company and the individual tour boat differences. Finally, this work does have an observer effect, as the physical presence of the researcher may influence participant and/or dolphin behavior. Precautions were taken to make researcher presence as unobtrusive as possible.

Final thoughts

This dissertation offers both academic and applied contributions to marine tourism research and the industry as a whole. The papers included have disciplinary applications offering the first in-water research exploring human and dolphin behavior simultaneously. This approach could be applied in various other human-animal interaction studies, and is an excellent way of integrating both qualitative and quantitative observations. By viewing ecosystems as a web of relations, the research and those working in the field can better recognize the many ways that humans influence these systems and the interdependence that is present.

Addendum

On August 23, 2016, NOAA Fisheries published a proposed rule to enhance protections for Hawaiian spinner dolphins across the Hawaiian Islands. The proposed rule would prohibit swimming with and approaching a Hawaiian spinner dolphin within 50 yards by any means (vessel, person, etc.) and would be implemented within two nautical miles from shore. The proposed rule is based on the Draft Environmental Impact Statement conducted in 2014. The research presented in this dissertation was shared with NOAA staff to help inform their decision-making on the proposed rules. Other alternatives considered included swims with regulations, and voluntary or mandatory time-area closures. The proposed rule does not address each island differently and would end all dolphin-swim with tour companies. NOAA Fisheries will be holding six different public hearings on O‘ahu and Hawai‘i Island throughout September 2016, and will be accepting public comment via email, mail or public hearing till October 14, 2016. The final rule will be determined by 2017.

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Appendix A. Previous spinner dolphin research in Hawai‘i

Researchers	Affiliation	Study	Location	Methods	Published
Kim Andrews, Leszek Karczmarski, Whitlow Au	University of Hawai‘i	Determining if environmental/social differences influence population genetics.	All Hawaiian Islands	Population genetic survey, region sequences and 10 microsatellite loci (n = 505).	Molecular Ecology (2010) 19
Kelley Benoit-Bird, Whitlow Au	University of Hawai‘i	Spinner dolphin prey dynamics affecting foraging over spatial/temporal scales.	Kealakekua Bay, Manele Bay, Electric Beach	5–10 km long transects sampled at 90 min intervals (6 pm – 4 am), including acoustic data.	Behavioral Ecology and Sociobiology (2003) 53
Sarah Courbis, Gregory Timmel	Portland State University	Looking at the effects of vessels and swimmers on the behavior of spinner dolphins.	Kealakekua, Hōnaunau, Kauhako, Hawai‘i Island	Video analysis of dolphin aerial behaviors around vessels/swimmers, scan samples.	Marine Mammal Science (2009) 25# 2
Kerri Danil et al.	University of California at Santa Cruz	Examination of spinner dolphin use patterns and the potential effects of swimmers on dolphin behavior.	Makua Beach, O‘ahu	Scan samples from land every 30 minutes, collecting info on school size, activity state, # of swimmers, aerial activity.	Aquatic Mammals (2005) 31#4
Fabienne Delfour	Paris, France	Examination of spinner dolphin behavior in relation to anthropogenic factors in resting habitat.	Leeward O‘ahu	Land/water surveys of group size; vessels/ swimmers - reporting behavior change.	Marine Biological Assoc. of UK (2007) 87#1
Heather Heenehan, et al.	Duke University, Murdoch University	Soundscape ecology of dolphin resting bays and dolphin presence.	Kealakekua, Hōnaunau, Kauhako, Makako, Hawai‘i Island	Passive acoustic monitoring and vessel-based visual surveys	J. Acoust. Soc. Am 140, 206 (2016); Ph.D.Dissertation (2016)
Wuyang Hu, Katya Boehle, Linda Cox, Minling Pan	University of Kentucky, University of Hawai‘i	Examination of economic values of dolphin excursions.	Main Hawaiian Islands	Mixed error competent choice model.	Marine Resource Economics (2009) 24

Researchers	Affiliation	Study	Location	Methods	Published
Leszek Karczmarski, Bernd Wursig	Texas A&M University	Studying spinner dolphin population structure.	Midway Atoll	Photo-ID and mark recapture techniques.	Behavioral Ecology (2005)
Marc Lammers	University of Hawai'i	Examination of occurrence and behavior of spinner dolphins.	South and West shores, O'ahu	Record behaviors (focal follow), measure acoustic signaling of dolphins.	Aquatic Mammals (2004) 30#2; Ph.D.Dissertation (2003)
Ken Marten, Suchi Psarakos	Earthtrust	Examination of long-term site fidelity of wild spinner dolphins.	Leeward, O'ahu	In-water observation, photo-ID, and video logging.	Mar. Mam Science (1999) 15
Kenneth Norris et al.	University California Santa Cruz	Examination of the behavior/ ecology of spinner dolphins.	Kealakekua Bay, Hawai'i Island	Theodolite tracking, boat-based observation, photo-ID.	<i>Spinner Dolphin</i> (1994)
Jan Östman	University California Santa Cruz	Examination of social organization/ behavior of spinner dolphins.	Kealakekua Bay, Hawai'i Island	Theodolite tracking, boat-based observation, photo-ID.	Ph.D. Dissertation (1994)
Lesley H. Thorne, David Johnston, et al.	Stony Brook University, Duke University	Characterized habitat relationships and generated spatial predictions of spinner dolphin resting habitat.	Main Hawaiian Islands	Maximum Entropy modeling	PLoS ONE (2012) 7(8). doi:10.1371/journal.pone.0043167
Julian A. Tyne , David W. Johnston, et al.	Murdoch University, Duke University	Estimate spinner dolphin population parameters and behavior.	Kealakeakua, Hōnaunau, Kauhako, Makako, Hawai'i Island	Capture–recapture models, boat-based <i>photo-ID</i> , <i>theodolite tracking</i> .	J. Applied Ecology (2015) 52 (3); PLoS ONE (2014) 9(1); Ph.D.Dissertation (2016)

Appendix B. Semi-structured interview questions

Commercial group questions

About the Interviewee/Dolphin Swim Company

1. Why did you get into the dolphin viewing and swim business and what is your current role?
2. How long have you been involved/offering tours?
3. Can you describe how you interact with other tour operators and the surrounding community?
4. Do you give any suggestions for how people can get involved in marine conservation?
5. Do you have any direct experience swimming with dolphins?

About the Dolphin Swim Industry

1. Have you seen changes to a) the dolphin population b) the industry/operators c) tourists during your time involved?
2. What kinds of barriers do you/your company experience?
3. What are the tourist's expectations when they come on a dolphin-swim tour? Are these realistic?
4. Do you have any self-made guidelines that you follow?

About the Dolphins

1. How often do you see/interact with dolphins?
2. How do you define a successful dolphin interaction?
3. Do you recognize individual dolphins?
4. Do you think the dolphins recognize you or your boat?
5. Do you feel a personal connection towards the dolphins?
6. What knowledge do you have of dolphins' in a) marine environment b) Hawaiian history?

About the Management/Conservation

1. What are your expectations of a conservation manager pertaining to dolphin protection?
2. Have you personally conducted or been involved in conservation efforts towards dolphins?
3. Can you comment on the regulatory or outreach efforts for spinner dolphins from federal or state management agencies?
4. Do you recognize any differences between federal, state, and non-profit conservation initiatives?
5. How do you view the existing relationship between operators, community, and government?
6. Have the relationships changed since the government started talking about regulating dolphin interactions?
7. Would your operation/business be affected if one of the government management initiatives under consideration went into? If so, how?
8. How do you think the management initiatives under consideration compare in their effectiveness?
9. Do you think there are better ways of managing participant's interactions with dolphins?
10. Do you think participants would still come on dolphin tours if they couldn't swim with the dolphins?
11. How adequate do you think the current protections (i.e. marine mammal protection act) are to the general well-being of a) the dolphins; b) the operators; c) the dolphin swim participants; d) the community?

Other

1. Are there any stories or things you would like to discuss pertaining to any of the topics we covered?

Community group questions

About the Interviewee

1. Do you swim with dolphins? If yes, what got you interested in dolphin swims and how long have you been involved?
2. Do you have direct experience swimming with dolphins? If yes, do you recognize individual dolphins? Do you think the dolphins recognize you?

3. How do you define a successful dolphin encounter?

About Dolphins/ Dolphin Swims

1. Can you describe how you interact with other dolphin tour operators and the surrounding community regarding the subject of dolphin swim tourism?
2. Have you seen changes to a) the dolphin population (numbers/behaviors) b) the industry/operators (numbers) c) tourists (demographics) during your time in this location?
3. What knowledge do you have of dolphins' in a) marine environment b) Hawaiian history

About the Management/Conservation

1. What are your expectations of a conservation manager pertaining to dolphin protection?
2. Have you personally conducted or been involved in conservation efforts towards dolphins or ocean preservation?
3. Can you comment on the effectiveness of some of the regulatory or outreach efforts for spinner dolphins from federal or state management agencies, any successes and failures?
4. Do you recognize any differences between federal, state, and non-profit conservation initiatives?
5. How do you view the relationship between operators, community, and government?
6. Have the relationships gotten better or worse since the federal government started talking about regulating dolphin interactions?
7. How would you be affected, if one of the management initiatives went into place?
8. How do the management initiatives compare in their levels of effectiveness?
9. Do you think there are better ways of managing human interactions with dolphins?
10. Do you think people would still visit the bays if they couldn't swim with the dolphins?
11. How adequate do you think the current protections (i.e. marine mammal protection act) are to the general well-being of: a) the dolphins; b) the operators; c) the dolphin swim participants; d) the community?

Appendix C. Post-swim survey for wild dolphin-swim participants

Thank you for taking the time to agree to complete this survey. Your participation in this study is completely voluntary and any questions you feel uncomfortable with you do not need to respond to. A follow-up survey will be administered three months from today's date via email. In order to receive the video of your dolphin swim today, you will have to complete and return a follow up survey within three weeks of receiving it. All responses will remain confidential and the data from this research will be coded and aggregated; some written responses may be extracted for quotes. If quotes are used they will not be traced to any individual. The confidentially coded data will also be shared with the National Oceanic Atmospheric Administration Protected Islands Resource Offices and other university researchers. This research has been approved by the York University Human Participants Research Committee as outlined by the SSHRC/NSERC/CIHR Tri-Council Policy Statement "Ethical Conduct for Research involving Humans" (August 1998).

Prior Experiences

1. What is your experience level of swimming in the ocean:
 today was my first time basic skills average swimmer advanced
2. What is your experience level of snorkeling in the ocean:
 today was my first time basic skills average swimmer advanced
3. What is your experience level of swimming with wild dolphins in the ocean:
 today was my first time basic skills average swimmer advanced
4. Have you been swimming with dolphins in a tank or enclosure before?
 Yes No
If yes, how many times? _____ Where did these experiences occur?
5. Have you been swimming with wild dolphins before?
 Yes No
If yes, how many times? _____ Where did these experiences occur?
6. Have you viewed dolphins (in a tank, enclosure, or show) before?
 Yes No
If yes, how many times? _____ Where did these experiences occur?
7. Have you viewed wild dolphins before?
 Yes No
If yes, how many times? _____ Where did these experiences occur?
8. Did you participate in the wild dolphin swim today for spiritual reasons?
 Yes No
9. Did you participate in the wild dolphin swim today for healing reasons?
 Yes No

The Wild Dolphin Swim Experience

10. On a scale of 1 – 5 please rank each of the following statements in terms of your feelings towards your wild dolphin swim encounter :

	strongly disagree	disagree	neutral	agree	strongly agree
o I felt the dolphins were aware of me	1	2	3	4	5
o I felt affection for the dolphins	1	2	3	4	5
o I felt the dolphins were affectionate towards me	1	2	3	4	5
o I felt it was a religious/spiritual experience	1	2	3	4	5
o I felt sympathy/empathetic toward the dolphins	1	2	3	4	5
o I was pleased/happy with the overall experience	1	2	3	4	5

11. Do you think that your wild dolphin swim tour negatively impacted the dolphin's ability to:

- o escape from predators like sharks () Yes () No
- o navigate and orient () Yes () No
- o reproduce () Yes () No
- o sleep () Yes () No
- o socialize or communicate with each other () Yes () No

12. Please share about your experience today on the wild dolphin swim tour (check all that apply):

- o boat size: () too small () too large () just the right boat size
- o boat speed: () too slow () too fast () just the right boat speed
- o number of boats on the water: () too few () too many () just the right no.
- o number of people in the water: () too few () too many () just the right no.
- o time spent in the water: () too short () too long () just the right time
- o outreach/conservation information provided: () too little () too much () just right

13. How did you regulate your own behavior today during your dolphin swim (check all that apply)?

- did not chase the dolphins
- I did not regulate my behavior
- keep quiet
- maintained distance from the dolphins
- swam with hands at side
- other (please describe):

14. On a scale of 1 – 5 please rank each of the following statements in terms of how enjoyable they were during your wild dolphin swim experience. Of the list below, please check only one square box for the statement that was most important to your enjoyment:

	strongly unenjoyable	unenjoyable	neutral	enjoyable	strongly enjoyable
<input type="radio"/> The experience of being in the ocean	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> The experience of seeing dolphins	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> The experience of being in water	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> The uniqueness of the experience	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> Identifying/ learn about the dolphins	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> Photographing/ video of the dolphins	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> Making eye contact with a dolphin	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> Touching a dolphin	1	2	3	4	5 <input type="checkbox"/>
<input type="radio"/> The behavior of other swimmers	1	2	3	4	5 <input type="checkbox"/>

15. How many dolphins would you estimate that you saw in the water today? _____

16. How close would you estimate that you got to the wild dolphins in the water today?

- within a football field
- within half a football field
- 10 yards/30 meters
- within my body's length
- arm's length
- direct contact
- other (please describe):

17. Please rank in order of importance (1 being first choice, 6 being last choice) your preference for dolphin interaction in the wild:

- locating and viewing from the boat ()
- photo or video recording of dolphins from the boat ()
- distribution or discussion of educational information ()
- swimming with no touching ()
- swimming with touching ()
- feeding ()

Attitudes about Dolphin Conservation & Management

18. Would you swim with a wild dolphin if you knew it could harm them?

() Yes () No

19. Would you go on a dolphin tour if you could not get in the water with the dolphins?

() Yes () No

20. Do you think the dolphins are in any danger from wild dolphin swims?

() Yes () No

21. Did you learn about any marine conservation on your trip?

() Yes () No

22. Would you participate or support in any marine conservation after this experience?

() Yes () No

23. Do you plan on swimming with wild dolphins again after this experience?

() Yes () No

24. Did you learn anything about dolphins/ocean from the dolphin swim experience?

() Yes () No

Swimmer & Company Demographics

25. I heard about swimming with wild dolphins in Hawai'i from (check all that apply):

- | | |
|---|---|
| <input type="checkbox"/> brochures/pamphlets | <input type="checkbox"/> movies |
| <input type="checkbox"/> friends/family | <input type="checkbox"/> newspaper |
| <input type="checkbox"/> hotel/concierge desk | <input type="checkbox"/> radio |
| <input type="checkbox"/> information booth | <input type="checkbox"/> television |
| <input type="checkbox"/> internet | <input type="checkbox"/> I don't know |
| <input type="checkbox"/> magazines | <input type="checkbox"/> other (please describe): |

26. Did you (check only one):

- plan this wild dolphin swim before going on holiday in Hawai'i or well in advance ()
plan this wild dolphin swim upon arrival in Hawai'i or one week prior to participation ()
last minute decision to participate in a wild dolphin swim ()

27. What were the factors in selecting the company that you went out with today (check, all that apply)?

- () advertisement () package tour
() cost () recommended by hotel/ concierge desk
() eco-friendly/eco-certified company () word of mouth
() guaranteed sightings () other (please describe):
() offered educational information

28. Do environmental certifications/recognition programs influence what company you select?

- () Yes () No

29. Are you aware of any environmental certifications/recognition programs in Hawai'i?

- () Yes () No

30. If so which ones?

- () CORAL West Hawai'i Voluntary Standards () Dolphin SMART
() Hawai'i Ecotourism Association Certified Businesses () Other:

31. What types of conservation messages did the company that you went out with today share with you?

32. I am: () Male () Female

33. Age: _____

34. I am: () Resident () Resident, born/raised in Hawai'i () Tourist, visiting from:

() Yes, I would like to receive a copy of my video from today's wild dolphin swim experience. Please email me the follow-up survey three months from today's date. Once I complete the follow up survey (within three weeks of receiving it) I will get an electronic copy of my wild dolphin swim video.

Email Address (Please print clearly):

Appendix D. Three month follow-up survey for wild dolphin-swim participants

Thank you for taking the time to complete the follow-up survey. Your participation in this study is completely voluntary and any questions you feel uncomfortable with you do not need to respond to. This survey has been emailed to you three months after you completed the original survey. In order to receive the video of your dolphin swim from three months ago, you will have to complete and return the follow up survey within three weeks of receiving it. All responses will remain confidential and the data from this research will be coded and aggregated; some written responses may be extracted for quotes. If and when quotes are used they will not be traced to any individual. The confidentially coded data will also be shared with the National Oceanic Atmospheric Administration Protected Islands Resource Offices and other university researchers. This research has been approved by the York University Human Participants Research Committee as outlined by the SSHRC/NSERC/CIHR *Tri-Council Policy Statement "Ethical Conduct for Research involving Humans"* (August 1998).

About the Wild Dolphin Swim Experience

1. Did you participate in a captive swim as well, during your trip to Hawai'i?
() Yes () No
2. Why did you want to swim with a wild dolphin?
() curiosity/intrigued () to get photographs/video of the dolphins
() for healing reasons () to have a unique experience
() for spiritual reasons () to learn about the dolphins
() something to do while on vacation () to touch a dolphin
() to communicate with a dolphin () other (please describe):
() to fulfill a lifelong dream
3. How close to a wild dolphin do you personally need to be to have a successful dolphin swim?
() within a football field () arm's length
() within half a football field () direct contact
() 10 yards/30 meters () it doesn't matter
() within my body's length () other (please describe):
4. How long do you personally need to be next to a wild dolphin to have a successful dolphin swim?
() ten minutes or longer () 30-59 seconds
() five-ten minutes () 0-30 seconds
() three –five minutes () it doesn't matter
() one – three minutes () other (please describe):

14. What was the most memorable part of the wild dolphin swim experience (check one)?
- the experience of being in the ocean
 - the experience of seeing dolphins
 - the experience of being in the water with dolphins
 - the uniqueness of the experience
 - identifying/ learning about the dolphins
 - photographing/taking video of the dolphins
 - making eye contact with a dolphin
 - touching a dolphin
 - the behavior of other swimmers/tourists
 - other (please describe):
15. Do you think dolphin swim participants can regulate their own behavior? Yes No
16. Would you swim with dolphins again? Yes No
17. Does it matter to you if the dolphins you swim with are free or in captivity? Yes No
Why?
18. Since your experience have you been on other wild dolphin swims? Yes No
If yes, which ones and where?
19. Did you learn anything about the dolphins from swimming with dolphins? Yes No
20. Were any personal values changed from the wild dolphin swim experience? Yes No
If yes, please describe:
21. Did you become interested in any marine conservation activities because of your wild dolphin swim experience (check all that apply)?
- choosing environmental household practices
 - choosing environmental purchasing practices
 - choosing tours that are eco-friendly
 - discussing the issues learned
 - joined an environmental group/society
 - no interest in/time for conservation
 - seeking further information/learning/courses
 - supporting wild dolphin conservation
 - volunteering
 - other (please describe):

22. Did you adopt any of the following conservation actions after participating in the wild dolphin swim (check all that apply)?

- choosing environmental household practices ()
- choosing environmental purchasing practices ()
- choosing tours that are eco-friendly ()
- discussing the issues learned ()
- joined an environmental group/society ()
- no interest in/time for conservation ()
- seeking further information/learning/courses ()
- supporting wild dolphin conservation ()
- volunteering ()
- other (please describe): ()

Conservation & Management of the Dolphin Swim Experience

23. Do you think the dolphins are in any danger from wild dolphin swims? () Yes () No

24. Swimming with wild dolphins has been raised as a concern by some people, with the potential to impact dolphin populations. To avoid these impacts marine management agencies in Hawai'i have proposed the following options. Please rank the following options in order of your preference (1 being first choice):

- closing bays during spinner dolphin resting hours ()
- codify and enforce minimum distance limits ()
- complete closure of bays where dolphins reside ()
- I don't know about management practices ()
- legalize and enforce recommended guidelines ()
- no action needed ()
- restrict swimming activities with dolphins ()
- restrict vessel activities with dolphin ()
- education programs for commercial tours ()
- other (please describe): ()

25. Given your observations, please rank on a scale of 1 – 5 how satisfactory current marine management policies are to the interests of the following:

	strongly unsatisfied	unsatisfied	neutral	satisfied	strongly satisfied
○ the dolphins	1	2	3	4	5
○ dolphin swim operators/business owners	1	2	3	4	5
○ dolphin swim participants who are visitors/tourists	1	2	3	4	5
○ the local community near dolphin swim operations	1	2	3	4	5

OR I have no understanding of current policies (please check)

26. Are you aware of NOAA's recommended viewing guidelines for spinner dolphins (listed below)? () Yes () No

NOAA Recommended Viewing Guidelines for Spinner Dolphins

- Remain at least 50 yards (1/2 a football field) from spinner dolphins.
- Limit your time observing to 1/2 hour.
- Spinner dolphins should not be encircled or trapped between boats or shore.
- If approached by a dolphin while boating, put the engine in neutral and allow the animal to pass.

27. If yes, where did you hear about them?

- | | |
|--------------------------|------------------------------|
| () brochures/pamphlets | () internet |
| () friends/family | () magazines |
| () government | () newspaper |
| () hotel/concierge desk | () television |
| () I don't know | () tour operators |
| () information booth | () other (please describe): |

28. If no, whose responsibility was it to educate you about it?

- | | |
|--------------------------|------------------------------|
| () friends/family | () information booth |
| () government | () media |
| () hotel/concierge desk | () tour operators |
| () I don't know | () other (please describe): |

29. Are you aware of the marine mammal protection act (MMPA)? () Yes () No

30. Do you think that swimming with dolphins is a violation of MMPA? () Yes () No

31. Please use the space below to share any other information or stories about your experience.

Appendix E. Glossary of terms

Aggressive behavior

Referenced for both humans and dolphins. Aggressive human swimmer actions were defined by chasing, diving, and deliberate approach behaviors. Swimmer aggression was associated with dolphins' increased breath at surface and diving behavior.

Anthropomorphize/Anthropomorphizing

Ascribing human attributes to an animal, in this case, a dolphin, implying a distinct separation between the human and the non-human (Fawcett, 1989). According to Evernden (1992) there are three types of anthropomorphism that influence our attitudes and how we behave towards non-human animals. These include “nature as object,” “nature as self,” and “nature as miracle” (Evernden, 1992). Nature as object treats non-human animals with no subjectivity, as an object to be explored and in existence to serve human desires. Nature as self is rooted in a deeper individual moral obligation to the natural world with concern for non-human animals as an extension of the self. Nature as miracle treats the natural environment as enigmatic, unpredictable, and wondrous.

Attitudes

Attitudes are feelings or a way of thinking about something based on an individual's perceptions and is reflected in behavior; for example, because I perceive it to be a lousy day, I am going to complain to anyone who will listen (Pickens, 2005). There is an intrinsic link between perception and attitude; an attitude is how you react to your perception and show the world what you think about what you have seen (Pickens, 2005).

Cetacean

Whale, dolphin or porpoise belonging to the order Cetacea.

Commercial

In this dissertation, acts as a category classification of interviewees that stand to make some profit or have a related financial interest related to the dolphin-swim industry and the Hawaiian spinner dolphins.

Common-pool resources

An economic concept coined by Ostrom (1990) referring to a form of natural resource utilization, which does not exclude potential beneficiaries from its use. In this dissertation, spinner dolphins are considered a common-pool resource. Common-pool resource theory is typically applied to governance of extractive natural resource utilization such as fisheries, but less for non-extractive resources like human interactions with cetaceans (Heenehan et al., 2015).

Community

In this dissertation, acts as a category classification of interviewees that reside in the same geographic location and have both positive and negative non-commercial interests and attitudes towards the dolphin-swim industry and the Hawaiian spinner dolphins.

Conservation

The act of trying to protect or restore natural resources; in the case of this dissertation, most instances of conservation refer to the preservation of marine environments or Hawaiian spinner dolphins.

Dolphin

A large group inclusive of toothed, small cetacean species (under ten feet in length), encountered in both natural and built environments.

Dolphin tourism

Any recreational or commercial dolphin watching, feeding, or swimming activity conducted in either a natural or captive environment, and excludes whale watching.

Dolphin-swim encounter

A swim with one or more dolphins in a visual range underwater for five seconds or more (Scheer, 2010).

Economic valuation

Measuring value from a human-centered financial perspective examining how ecosystems affect people (King and Mazzotta, 2000). Valuations help to make choices that involve tradeoffs in resource allocation. The theory of economic valuation is based on individual preferences and choices expressed through market selection (King and Mazzotta, 2000).

Ecosystem-based

An ecosystem-based approach to management, using a holistic perspective to focus protection on an entire area or ecosystem opposed to management of a specific species or element of the environment (Leslie and McLeod, 2007). Ecosystem-based approaches consider human activities, and value humans as part of the ecosystem.

Ethology

An interdisciplinary biology-based field that refers to the comparative, evolutionary, and ecological study of animal thought, processes, beliefs, rationality, and consciousness. Traced to writing of Charles Darwin, an anecdotal cognitivist (Allen and Bekoff, 1997).

Human-dolphin interactions

The physical, emotional and spiritual communication between humans and dolphins that take place in the marine environment. For the purposes of this dissertation, these interactions take place in the context of dolphin-swim tourism.

Interdisciplinary

An academic study pulling from more than one discipline or branch of knowledge and merging insights from each discipline into the research.

Marine Mammal Protection Act (MMPA)

Enacted on October 21, 1972 and later amended in 1994, the policy includes all marine mammals in United States and prohibits the take (i.e., hunting, killing, capture, and/or harassment) of marine mammals, and the import, export, and sale of marine mammal

parts and products. It regulates scientific research in the wild and establishes requirements for the public display of captive marine mammals (NOAA).

Marine tourism

Recreational activities that involve travel away from ones place of residence and that have as their host or focus the marine environment (where the marine environment is defined as those waters that are saline and tide-affected) (Orams, 1999).

Perceptions

Perception is the use of the mind or senses to comprehend or understand a person's surroundings (Pickens, 2005). Perceptions can influence people's attitudes.

Phenomenology

An area of study that focuses on individuals' achieved understanding through lived experiences and stories (Starks and Trinidad, 2007). The phenomenological inquiry presented in this dissertation concentrates on what it means to experience the underwater world by reflecting on the physical and emotional aspects of wild dolphin swimmers.

Pod-life

Human emulation of dolphin behaviors and characteristics, specifically meaning to live and work together as a group or "pod", like the dolphins.

Spiritual

Dolphin-swimmers who believe that dolphins have spiritual powers that include telepathy, healing abilities, and possibly connections to other planets.

Stakeholder

A person, group, community, or business that has interest or concern in the dolphin-swim tourism industry.

Total Economic Value (TEV)

An environmental economics framework for valuation or cost-benefit analysis which includes direct, indirect, and non-use values (Millennium Ecosystem Assessment, 2005). This framework focuses value on natural/heritage resources based on an ecosystem (Millennium Ecosystem Assessment, 2005).

Tourism (Ecotourism)

International travel that incorporates consumptive and non-consumptive activities seeking to achieve a sustainable relationship with the natural, socio-cultural, and economic environments. Many forms of tourism view and/or encounter wildlife in a range of settings from captive to wild, and encompass a variety of interactions from passive observations to feeding and/or touching the species viewed (Newsome, Ross, and Moore, 2005).

Wild dolphin-swim tours

Commercial marine tours in open-ocean that place willing participants in the water with dolphins equipped with snorkeling or swimming equipment. These tours mostly take place from a boat but can be conducted from shore as well.