

AN EXAMINATION OF ENVIRONMENTAL PRACTICES USED IN COMMERCIAL SEA
KAYAKING IN BRITISH COLUMBIA

By

GREGORY RICHARD SIMMONDS

Bachelor of Tourism Management, Thompson Rivers University, 2009

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF

MASTER OF SCIENCE IN ENVIRONMENTAL SCIENCE

in the Department of Tourism

Thesis Examining Committee:

Robert Hood (PhD), Associate Professor and Thesis Supervisor, Tourism

Brian Heise (PhD), Associate Professor and Committee Member, Natural Resource Science

Jon Heshka, Associate Professor and Committee Member, Adventure Studies

Dave Whiting, Course Instructor and Committee Member, Natural Resource Science

Marc Miller (PhD), External Examiner, School of Marine and Environmental Affairs, University of
Washington

August, 2012

Thompson Rivers University

Gregory Richard Simmonds, 2012

Thesis Supervisor: Associate Professor Robert Hood

Abstract

The commercial sea kayaking sector of British Columbia's tourism industry depends entirely on the pristine quality of the coastal environment. With more than 70,000 visitors choosing BC waters for their wilderness kayaking holidays, the potential for anthropogenic impact on the ecosystem is an undeniable reality. This study addressed this concern by examining the actions and behaviours being applied by commercial sea kayak guides while escorting clients through this fragile ecosystem. Through the use of observations, surveys, and interviews a multiple method approach to research enabled this study to capture an in depth understanding of the environmental practices being used by commercial sea kayak guides in British Columbia.

Undisclosed participant observations, allowed for the informative observation of seventeen guides to occur while minimizing the possibility of altered subject behaviour; the first guide observations of this kind in BC. This methodological approach was combined with a self-report survey of a larger sample of guides, which allowed for the inclusion of a greater spectrum of experiences and reported behaviours from active guides. Finally, a number of interviews with various industry professionals provided greater context surrounding actions, behaviours, and decisions made by those who operate in this industry.

The seventeen guides observed in this study, along with survey respondents and interviewees, collectively demonstrated a great respect for the wilderness environment and expressed actively trying to manage their associated impacts. However, despite being unintentional, the inconsistent use and misapplication of low impact practices were identified among the studied guiding population. In some cases this resulted in unnecessary human impacts on the environment. Interactions with wildlife and general camp management were identified as areas that displayed common weaknesses among guides. These weaknesses came in the form of frequent deviations from the best management practices outlined for this activity and endorsed by the related professional organizations. Interviews and survey responses suggested that these differences between the suggested best management practices and the actual practices applied may be a result of misinformed guides or those not educated on the specific environment in which they operated. Supporting this notion, more than 70% of the guides in this study encouraged the expansion of educational opportunities for current and upcoming guides; particularly in the form of

workplace training which can accommodate regionally specific practices. Increasing the awareness of specific practices may result in more consistent use in the field setting.

Overall this study concluded that the consistency with which best management practices were being used at a guide level could be increased to further reduce the ecological impact of guided sea kayak adventures in British Columbia. Through increased training and more effective implementation of low impact techniques among commercial guides, it is hoped that the anthropogenic impacts can be minimized, the visitor attraction be maintained, and the overall sustainability of this industry be secured well into the future.

Keywords: kayaking, ecotourism, best management practice, environment, marine tourism

Table of Contents

Abstract.....	ii
Table of Contents.....	iv
Dedication.....	vii
List of Figures.....	viii
List of Tables.....	viii
Introduction.....	1
Purpose of the study.....	2
Literature Review.....	4
Challenge of Nature Based Tourism.....	5
Recreation Impact Study.....	6
Industry Best Practices.....	8
Multiple Methods Research.....	10
Tour Guide Behaviour.....	11
Gaps in the Literature.....	12
Methodology.....	13
Participant Observation.....	14
Geographic Area.....	14
Sample Selection.....	15
Participant Observer (Instrument).....	15
Data Collection.....	16
Data Analysis.....	18
Survey.....	19
Participant Selection.....	19
Distribution.....	19
Instrument.....	20
Data Collection.....	21
Data Analysis.....	21
Limitations.....	22
Interviews.....	22
Participants.....	22

Informal Interview	23
Data Analysis	23
Results.....	24
Observations	24
Guide Demographics	24
Wildlife Interactions	25
Site Selection	33
Camp Management	36
Summary	44
Survey Results	45
Survey Respondents.....	45
Guiding Behaviours	48
Site Selection	52
Camp management.....	55
Role as a Guide	61
State of the Industry	63
Observation of other Guide Behaviour	64
Discussion.....	66
Guide Practices	66
Wildlife practices	67
Site preferences.....	70
Camp practices.....	71
Inconsistent Guide Behaviour.....	74
Observation/Survey Connection	74
Conclusions	76
Suggested Actions.....	77
Further Research	78
Literature Cited	79
Appendix A – Glossary of Terms	82
Appendix B - Guide Survey.....	1

Acknowledgements

I would like to acknowledge all the people who helped to make this project possible. Thank you to the many guides, operators, and associations who participated in the study and provided me with the information needed to make this happen.

Furthermore, I would like to thank my committee for providing me with great feedback, support, and the direction needed to make this project manageable and a success. I also want to thank the faculty in the Tourism department at TRU for providing me with a space to work from and endless assistance throughout my study.

Finally, I would like to thank my friends and family who gave me support and encouragement throughout this entire process. In particular I want to acknowledge my family. Thank you to my mother, father and two sisters who each spent countless hours as my editors, technical support, and research assistants throughout the years.

Thank you to all.

This study was approved by the Thompson Rivers University Research Ethics Committee – Human Research, 09-10-41S.

Dedication

This study is dedicated to Brenda Simmonds. Thank you for teaching me that learning is a lifelong process, and that time spent learning is always time well spent. And for providing me with the encouragement, motivation, and loving support needed to complete this study.

List of Figures

Figure 1. Figure 1. Methodological framework with expected contributions.....	13
Figure 2. Intertidal life encountered and/or handled by guides on the twelve observed trips.....	28
Figure 3. Number of years of experience of respondent sea kayak guides.....	45

List of Tables

Table 1. Observations by category for field observations of active sea kayak guides.....	17
Table 2. Characteristics of guides observed.....	25
Table 3. Intertidal marine species observed and/or handled during commercial sea kayak trips.	27
Table 4. Marine species observed during commercial sea kayaking trips.	31
Table 5. Beach substrates of launching/landing sites used during commercial sea kayak trips	35
Table 6. Tent site substrates used during commercial sea kayak trips.....	36
Table 7. Guide held certifications by organization and level.....	46
Table 8. Primary geographical guiding region of respondents	47
Table 9. Primary land zoning for guide led trips	48
Table 10. Guide reported behaviour while interacting with intertidal marine life.....	50
Table 11. Guide reported behaviour while viewing marine mammals with clients.....	51
Table 12. Factors involved in camp site selection as ranked by responding guides	53
Table 13. Tent site substrate preferences as ranked by responding guides.....	54
Table 14. Importance of factors for launching and landing kayaks as ranked by responding guides.....	55
Table 15. Various kitchen management practices as indicated by respondents.....	57
Table 16. Human waste management practices as reported by respondents	58
Table 17. Fire practices of respondents	60
Table 18. Source of formal environmental training of respondents.....	61
Table 19. Respondent opinions on formal environmental training.....	62
Table 20. Respondent opinion on the state of various categories within the sea kayak industry	64

Introduction

British Columbia is considered by sea kayakers to be one of the world's premier paddling destinations. This coastline provides easy access to an incredible diversity of wildlife, geography, climatic conditions and cultural history that cannot be found elsewhere; it quite literally has a little bit of everything. The 27,000 km of pristine coastline attracts over 70,000 clients from around the world (Sea Kayak Tourism, 2007) who seek a seemingly untouched wilderness experience. Commercial sea kayak operators and guides have established a viable industry that is entirely dependent on the quality and integrity of the environment. With such a high volume of visitors now entering this sensitive environment (highly concentrated between the months of May and September [Tourism BC Sea Kayak Study, 2005; Twardock and Monz, 2000]), there becomes a notable challenge of providing access to these areas, while still being able to maintain protection of this valuable and extremely limited resource. As such, it is essential that attention be directed towards the practices and policies that are being used to help maintain the environment's condition. Only through proper strategic planning and management can the environmental impacts be minimized while still allowing for optimal visitor experiences (Highman and Luck, 2008).

Best management practices (BMPs) have been developed to help manage and minimize the overall impact associated with increased visitation. These strategies come from careful empirical research that has been conducted over a number of years in the field of "recreation ecology" (e.g. Cole, Monz, etc.) and are tailored to be effective in specific environments. Outlined in these practices are the most effective methods for minimizing impacts on wildlife and the physical environment while traveling in the given wilderness ecosystems. Although an industry with limited official regulation, the various professional sea kayaking organizations view environmental protection as a vital element to the industry. As such, each endorses environmental ethics and standards to be upheld by the guides they certify (e.g. Sea Kayak Guides Alliance of British Columbia, Association of Canadian Sea Kayak Guides). However, it is important to understand that the effectiveness of these practices can only extend as far as their use. In reality it comes down to whether or not the management strategies are being utilized by professional guides while leading clients through these pristine environments.

Professional sea kayak guides provide an important bridge between the existence of low impact practices and their application. On a basic level guides are hired by those who lack the knowledge and/or experience to travel on their own. Beyond the basics, guides serve as models for how visitors might conduct themselves in the wilderness environment. Different environmental settings (glacier, marine, alpine, river) each have with them a specific manner in which one should behave (Leave No

Trace/Backpacker); one of which is the marine environment. A visitor is likely to be unaware or unfamiliar with the specific environment that they are paddling in and the practices that are most appropriate. Conversely, sea kayak guides are well versed in how to be comfortable and efficient in the complicated marine environment that involves both aquatic and terrestrial skill sets. It is up to the guides to provide area specific information on how to act in this different ecosystem. In this way, sea kayak guides have become an integral vehicle for the transfer of knowledge about environmental actions and impacts to novice sea kayakers, both through verbal instruction as well as through demonstration (role-modeling). Guide practices and behaviors extend far beyond that of their individual impact and have the potential to influence the behaviors of many of their clients.

Despite having the scientific knowledge of how to lower impact through the use of low impact practices, it has not yet been established if these strategies are being effectively or consistently used in the field of sea kayaking. A gap in research has existed, connecting the established BMPs to their use among professional sea kayak guides in British Columbia. To date, research in the kayak tourism sector had focused primarily on three main dimensions: the demographics of the industry and economic valuations; the experience and motivations of the visitor; and the impacts and thresholds of a geographical area (e.g. SeaCanoe, Thailand). Limited research had been conducted on the actions of guides providing these services. This study examined the extent to which commercial sea kayak guides in British Columbia are applying best environmental management practices in a commercial context.

Purpose of the study

This study was directed at gaining a better understanding of what and how environmental practices are being used by commercial sea kayak guides while in the field. As the number of visitors increase, and the number of pristine areas decrease, proactive management of these important ecological areas has become more important than ever. This study was proactive in that it assessed the current practices of commercial guides with regards to their environmental protocols. Early assessment is one of the fundamental elements to a proper management strategy, and plays an important role in the conservation of valuable resources such as the BC coast.

As limited research existed on the topic of observed guide behaviours while in the field with clients, this study aimed to be the first known research of its kind in British Columbia. By applying a unique study methodology, the researcher was able to gather information in an unbiased format, beyond that traditionally accomplished through self-report studies. This served to fill the research gap that existed

between the knowledge level of guides on best management practices and the application of these practices in the wilderness setting.

The study was designed to examine, in depth, the behaviours of a small sample of sea kayak guides. With a generally undefined greater guiding population, and limited information on the number of guides and overall size of the industry in BC, there was no realistic way to create an accurate sampling frame that would relate to all guides in British Columbia. Therefore the purpose of this study was not to create something to be generalized to the greater population, but instead was to narrow the focus and produce an in-depth study of a smaller group of guides on the BC coast. Despite lacking statistical generalizability, it is possible that the results or suggested actions found in this study will have application among the many working professionals who operate within the commercial kayak industry.

The direct objectives of this study were to:

- 1) Gain an understanding of the best management practices for sea kayaking to date.
- 2) Identify the level of awareness of BMPs among sea kayak guides in BC.
- 3) Observe the extent to which these practices are being utilized while guiding clients.
- 4) Identify areas for improvement and possible strategies for better implementation.

Literature Review

Introduction

The sea kayaking industry has grown worldwide at an incredible rate. Throughout the 1990s and continuing into the 2000s, increasing participation at both a recreational and commercial level has been a steady trend in North America, Europe, Asia, and regions of Oceania (Weaver, 2001). Unofficial estimates show this as a continuing trend to date. Encompassed within this trend are increases in kayak rentals, tours, recreational and professional training, and of course the sales of personal kayaking products. In 2005, a study of BC operators identified 114 companies offering a commercial sea kayaking product or service (Tourism BC, 2007). This study defined the commercial side of the industry as a business that offers rentals, guided trips, and/or professional or recreational training programs. These companies annually provide services to over 77,000 clients in BC alone and are responsible for bringing over \$14,000,000 dollars to the economy (Tourism BC, 2007).

British Columbia's recreational kayaking sector has also seen tremendous growth since the 1990s. Recent figures place an average of 60,000 recreational sea kayaking participants in BC annually (Parks Canada, 2007). From this group, it is estimated that over 50% use commercial businesses for guiding and rental services (Parks Canada, 2007). Kayak instructors and professionals also often recommended that recreational paddlers use commercial kayak shops as an information tool when paddling in unfamiliar locations (Taylor, 2009).

The sea kayak industry in British Columbia is one that has limited government regulations in place for the individual guides; this meaning that there are no government policies or laws that directly regulate the actions and behaviours of those operating as guides in this industry. Despite this lack of official government regulation, the industry is largely self-governed and overseen by two professional organizations; the Sea Kayak Guides Alliance of British Columbia and the Association of Canadian Sea Kayak Guides. These organizations focus on providing a membership-based group of guides trained to meet certain levels of skills and safety. Both of these organizations consider respect and ethical consideration for the environment to be a part of their foundations (Sea Kayak guides Alliance of BC, 2011; Association of Canadian Sea Kayak Guides, 2011). Although considered advantageous for a guide, maintaining active membership is not required by all companies. As such, the organizations can have membership bases of over 700 individual guides, although many of these do not actively guide through each season (McNeil, communication, 2011).

This literature review covers an assortment of topic areas that are relevant to this study, and help to give a better understanding of the research to date. Sections included are: Nature/tourism paradox; Recreation impact study; Industry best practices; Multiple methods research; and Tour guide behaviour. Beyond this, there is a brief section highlighting the gaps that exist in the known research.

Challenge of Nature Based Tourism

Aldo Leopold once said, "It would not be logging, mining, or roads that would threaten the wilderness, but the people who came to visit these areas" (Taylor, 1997). For many, the motivation to travel is rooted in the sensory and emotional experience of emersion in nature. Among many wilderness users the simple notion of "getting away from it all" is a recurring theme (Hill & Gale, 2009). However, inherent to nature based tourism and travel, is the increased visitor volume to sensitive environments, which in itself puts the future sustainability of the environment at risk (Hill & Gale, 2009). Thus a paradox exists, placing nature tourism potentially in opposition to conservation principles.

This is not a new concept in wilderness tourism, but instead has been a point of contention for over a century. It was in the mid-1800s that the first environmental advocates succeeded in forming national parks and protected wilderness areas (this has become the Sierra Club). Yellowstone National Park (founded in 1872) had a mandate "to provide a public park or pleasuring-ground for the benefit and enjoyment of the people" and "for the preservation, from injury or spoilation, of all timber, mineral deposits, natural curiosities, or wonders . . . and their retention in their natural condition" (Yellowstone National Park Act of 1872 [30 U.S.C. pp. 21-22, 17 Stat. 32]). At this early stage of park development, there was recognition of the value of not only both protection of the environment, but also the provision of access to the wilderness for recreation. Ever since, there has been a challenge for public lands and wilderness areas to balance the integrity and sustainability of the environment while at the same time facilitating continued public use.

As more tourists enter into these eco-sensitive areas, there is increased potential for negative environmental effects and degradation. The government of British Columbia has recognized this connection between the commercial use of wilderness areas and ecosystem impact. As such it has compiled an assessment of possible impacts that can result from commercial backcountry use. The report outlines the potential impacts and their severity, potential mitigation strategies, and emphasizes the importance of appropriate management action (Ministry of Environment, 2006). For example, the document addresses a concern; assigns desired behaviours of tourism operators; establishes indicators;

and finally describes limits of acceptable change (Ministry of Environment, 2006). Unfortunately in areas with magnificent natural beauty that attract large crowds, these types of prevention measures were not in place early enough. For example, areas such as the Grand Canyon or Hueco Tanks, Texas have been subject to heavy restrictions and closures in an attempt to reverse the environmental devastation that resulted from previously uncontrolled visitation (Sherman, 1995). Irreversible damage is unfortunately commonly associated with the heavy use of nature travelers.

This is not just a North American problem, but in fact the issue has been identified worldwide. In China, officials have acknowledged increased visitation as a major factor in harmed landscapes and scenery within national nature reserves, including the threat of irreversible damage to endangered species (Zhang et al., 2009). Similar impacts have been noted in Thailand where poor environmental practices coupled with high visitor numbers have caused irreversible damage to many areas of coastlines, islands and marine life (Weaver, 2001). Drawn in by the natural beauty of these destinations, attractions, and wildlife viewing opportunities, untrained tourists are knowingly, or unknowingly, responsible for causing extensive damage to the very things they come to see.

Recreation Impact Study

Recreation ecology is just one approach aimed at environmental protection and can be defined as the field of study that examines, assesses and monitors visitor impacts, typically to protected natural areas, and their relationships to influential factors (Leung and Marion, 2000). Despite heightened attention in recent decades as a result of the volume of visitors to remote and wilderness areas, there are still relatively few experts conducting field research in this specific field of study (Leung & Marion, 2000). One of the complexities to this genre of study is the difference in long term versus short-term impacts. It is often possible to see a visible, real-time impact from visitors on a particular site; what is harder to understand is the cumulative ecological impact ten or twenty years into the future. In one study impacts of boot trampling were adjusted to the *Leave No Trace* principles for minimized impact. Although this proved to reduce the short-term impact on the study site, there was no noticeable benefit in the long-term assessment (Leung and Marion, 2000).

This field of recreation impact has focused largely on the site impacts of heavily used camping destinations. More specifically, the attention has been on the disturbance to soil and vegetation caused by overnight camping. Cole (2004) confirms the relationship between impact and frequency of use to be nonlinear. That is, the initial use has the greatest impact on any given site and subsequent use does not

have the same dramatic impact as the first. Studies by Leung and Marion (2000) drew similar conclusions, and identified some of the more avoidable visitor impacts. Impacts such as littering, trail widening, the creation of new campsites and the improper disposal of human and food waste are causes of unnecessary impacts that can be easily avoided or reduced (Leung & Marion, 2000). The proper use of education and provision of information can drastically reduce impacts from camping activities (Leung & Marion, 2000).

Monz, Twardock, et al. (2010) have also completed extensive research on visitor impact specific to the Pacific Northwest; most notably the marine area of Prince William Sound in Alaska. Here studies were aimed at assessing the long-term impact of marine access camp locations used primarily by kayakers. Vast geographical ranges and time commitments required to examine site impacts make this type of study rare and logistically complicated (Twardock & Monz, 2000). Despite this, Monz, Twardock et al. (2010) were able to identify characteristics of marine campsites that are of growing concern. As above, the proliferation of new campsites has been identified as having a more significant impact than that of higher use confined to existing sites. In a second study in the Prince Williams Sound area, additional avoidable concerns were associated with improper disposal of human waste and the construction of fire rings (Twardock, Monz, et al., 2010). As more visitors are seeking the experience of the untouched wilderness, human disturbance and environmental impacts have become more of a concern among area managers (Twardock, Monz, et al.).

Orams (1999) identified one of the largest challenges with the growth in marine tourism; balancing activities with environmental protection. With the majority of marine tourism occurring within close proximity to the coastline (Orams, 1999), there is a heavy concentration of users in a relatively small area; in terms of impact the vastness of the ocean itself becomes somewhat irrelevant. Sea kayaking seems to have extremely low impact on the ocean itself; however its effect on wildlife and shorelines can be extensive (LNT Sea Kayak Booklet, 2001). In 2009 the Orca Relief Citizens Alliance outlined the negative impact of commercial whale watching on the southern resident orcas (a group of whales known for inhabiting near shore waters in the Southern Gulf Islands of the Georgia Strait). This organization documented devastating physical and behavioural alterations in orcas as well as other cetacean species that regularly inhabit the area. Easy and close access to these waters has made this a particularly popular destination for whale watching including tours using all types of vessels (e.g. kayaks, zodiacs, and large viewing vessels). This study was conducted on whale watching in general and does not make individual claims about sea kayak impacts on the animals. It is similarly important to note that with many of these studies, there is a limited ability to distinguish commercial impact from those of recreational users, as the studies are usually conducted in areas frequented by both groups.

In opposition to the regularly reported negative impacts, there is also a strong level of support for commercial tourism with regards to environmental protection. Eagles et al. (2002) illustrate the potential benefits of well-managed nature based tourism as an avenue for conservation. The economic gain from visitors to these areas, and through commercial licensing, can often increase the cash flow into a region. Additionally, Bruce Petch of BC Parks (2010) highlights the value of using commercial adventure and wilderness guides as an educational tool. Tourists who are unaware of ecological sensitivity of a given niche may be educated on proper techniques for mitigating their impacts in the backcountry. This of course relies on the proper training of guides in best management strategies and sustainable operations (Manning, 2010).

Industry Best Practices

Best management practices (BMPs) are the meeting point between environmental conservation and practical operating procedures. According to Sirakaya (1997), best management practices have been developed for the majority of subsectors and activities within the broad tourism industry. However, the majority of these BMPs are focused on the central location for business transaction (ex. office operations). Less often examined is the operational field environment where products are delivered. Adventure and nature tourism operators should be aware of the BMPs for their physical office, but also need to consider their operating environment as a separate workplace. The physical office is the actual business or office location; here the standard practices for business operations apply such as recycling, turning off lights, and minimizing garbage. The operating environment provides the physical location for the product, and as such requires an individual set of protocols. It is this operating environment that has unique requirements that extend far beyond that of an office location. In addition to practices such as recycling and waste management, the wilderness setting also needs a set of protocols to ensure that physical environmental damage does not occur; this incorporates practices reflecting low impact camping, careful wildlife management, and respectful group behaviour.

Recognizing the impact of tourism on wilderness environments, the BC government created the *Interim Guidelines for Backcountry Recreation in British Columbia (2000)*. This document outlined current issues and concerns with backcountry tourism operations, and discussed mitigation strategies to overcome the negative impacts. Brown (as cited in Wilson & Hamilton, 2004) noted that the tourism sector was in favour of best management practices, as opposed to the implementation of formal regulation and guidelines.

Manning (1999) describes regulation as being a direct management strategy. By this he means there is a heavy involvement of formal rules and laws that require policing and punishment for those who do not strictly adhere to the designed regulations. BMPs can be better aligned as an indirect form of management, where guidelines are suggested and adopted by those in the field. There is an internal decision process involved instead of prescribed behaviour. In the realm of sea kayaking, this seems to be the preferred model amongst both guides and operators as it offers a level of flexibility to account for the varying situations that may occur. Manning (1999) further supports Brown's study that indicates the lower level of desirability for formal regulation as a management strategy.

Brown (as cited in Wilson & Hamilton, 2004) also noted that the more formal guidelines were based on scientific species-specific studies, as well as management models, and did not accurately reflect tourism operator experiences in the wilderness. From this study it was decided that the guidelines were not yet ready to be implemented, or possibly not the best approach for environmental management of wilderness areas. However, it was learned that tourism operators are strongly supportive of the use of BMPs within their industry, as opposed to official guidelines and less adaptive protocols (Wilson and Hamilton, 2004). This concept has been further supported by some initial research conducted among sea kayak guides in BC, where they responded favourably to the use of BMPs within their work realm (Simmonds, 2009).

Nevin Harper (2010), from Outward Bound, suggests that there is no one set of protocols that can be clearly crafted as formal policies for these activities. Instead, principles and less rigid guidelines are used leaving guides with an arsenal of tools to choose the "best fit" option for any given scenario. As environments all dictate different approaches to impact management, it is incredibly difficult to provide one set of protocols. With this in mind there are a number of different low impact programs that address impact management. The most notable is the *Leave No Trace Program* created by the US Forest Service (now the Aldo Leopold Wilderness Research Institute) in conjunction with the National Outdoor Leadership School (NOLS); a program that by 2003 had more than 90,000 people trained in its LNT principles (McGivney, 2003).

The Leave No Trace (LNT) program is based on seven defining principles for outdoor ethics. Although the program recognizes that leaving "no trace" is an impossibility, these seven broad principles are identified as key areas for impact reduction while travelling in the wilderness setting. Each principle has a detailed goal for impact management, and includes mitigation techniques and strategies that have direct applicable wilderness use. NOLS guides, leaders in outdoor education and experiences, follow the LNT program to the letter, and fully endorse its effectiveness in the wilderness setting (NOLS, 2010). The seven principles highlighted through Leave No Trace are:

- Plan Ahead and Prepare
- Travel and Camp on Durable Surfaces
- Dispose of Waste Properly
- Leave What You Find
- Minimize Campfire Impacts
- Respect Wildlife
- Be Considerate of Other Visitors

The current approach for a large number of operators and associations is the adaptation of the original LNT program principles, to their operations or activities. The Sea Kayak Guides Alliance of BC and Association of Canadian Sea Kayak Guides both reference the LNT system as their preferred approach to environmental practices (SKGABC, 2010; ACSKG, n.d). Unfortunately, there is little research that shows the level of compliance in the field.

Multiple Methods Research

Tourism has long been recognized as a difficult industry for traditional single dimension research methods. Because of the many factors and aspects involved in this field that spans social, environmental and economic realms, it has become regular practice to incorporate a multi-faceted approach to data collection. Beeton (2005) describes multiple methods research as a key approach to producing valid and reliable results. Visitor surveys are commonly identified as a primary tool for gathering data on the activity. Surveys provide a perfect scientifically based research tool that allows researchers to gather data focused on marketing and customer satisfaction (Walle, 1997). However, it also noted that this can produce a very limited focus, and is not best suited for all research applications. Walle (1997) suggests that a variety of qualitative and quantitative research methods be used together to create a more comprehensive picture. In more recent studies, a combination of survey, interview, and observational research has been a part of the researcher toolbox.

Case study research is one branch that benefits from the utilization of multiple methods. One of the main criticisms of case study research has been the susceptibility of human bias during instrument design and data collection. Beeton (2005) feels this bias can be minimized or eliminated through the use of multiple research methods including both qualitative and quantitative data collection, as well as differing avenues such as combining surveys with observations. Arnould and Price (1993) illustrate these multi-dimensional research methods as being key to establishing a holistic image of these complex topics, in their study of river rafting experiences and its service elements. Multiple surveys, observations, and interviews were combined to collect data from a variety of participants and employees, providing a more complete view of the study objectives. Patton (1986) further supports this approach, by implying that the

utilization of multiple methodologies can account for, and overcome, the weaknesses of any one particular method, resulting in a stronger research method.

Tour Guide Behaviour

Tour guides are viewed, by visitors, as authority figures in their regional area and discipline (Littlefair, 2003). It is generally accepted that through this position of perceived authority, tour guides are in a unique position to influence and educate clients on environmentally responsible behaviour. Despite having documented this position for influence, published research extending beyond this point is lacking.

An article by Weiler and Kim (2011) demonstrates the shortcomings of practical and observable research that has been completed on the topic of tour guide actions and influences. Many of the studies to date have focused on evaluating the gains of factual knowledge by clients, and failed to establish impact on long-term behavioural changes. In addition, research has shown that tour guides may not be using interpretive messaging to its greatest potential. Armstrong and Weiler (2002) found that operators in national parks are not providing a high number of messages aimed at responsible behaviour in parks. Randall and Rollins (2009) had similar findings when studying sea kayak guides in a national marine park in Canada. Here, during post-trip surveys, clients reported the failure to communicate environmentally and culturally responsible behaviour. The research indicates that although tour guides are well positioned to deliver important messages about environmental and cultural interaction, they are failing to do so in an effective manner.

Gurung et al. (1996) and Hu (2007) both completed studies that suggest the ineffective communication may come from inadequate training on visitor communication. This lack of training may result in a tour guide's inability to transfer knowledge of environmental awareness, or inspiration for their clients to adjust personal behaviours. Furthermore, complacency in industry allows for this trend to occur. Seldom is there encouragement for a higher level of training and education, employee benefits, or reward for high quality guides to remain in the industry (Weiler and Kim, 2011). Weiler and Kim (2011) further establish that empirical research and industry support need to both advance in order to create a platform where the position of the tour guide can be utilized for the extensive environmental and cultural benefits that are possible.

Gaps in the Literature

To date, the majority of research on environmental impact of tourism has focused on estimating visitor impacts in relation to visitor volume and ecological thresholds. Significant attention has been placed on theorizing visitor management models aimed at mitigating visitor impacts while maintaining visitor satisfaction. However, there has been limited research illustrating the level of adherence and implementation of best management strategies at the frontline level. One such study was attempted in the marine tourism industry in Australia, but was largely unsuccessful due to lack of cooperation from operators (Byrnes and Warnken, 2003). Boat operators did not wish to participate in the study, and failed to cooperate in select forms of data collection. Although volume of visitation is a key element to ecological impact, it is also possible to speculate that visitor behaviour, or guide behaviour, is another variable that drastically alters the impacts.

Methodology

As highlighted in the literature review, this study incorporated multiple methods of data collection. Participant observation, survey research, and interviews were three different methods applied to this study. Each approach provided independent contributions to the overall study, as well as offered support for the development and delivery of the other two approaches (Figure 1). First, participant observation was used as the primary method of inquiry for this study. Direct observation of guides offered a detailed view of a small sample of guides and the specific practices being used by those individuals. Second, the inclusion of a guide based survey allowed the researcher to poll a larger sample of guides, thus incorporating a greater range of experiences into the data pool. This allowed for a basic comparison between the actions that were observed in the field, and the actions self-reported by the survey respondents. And lastly, interviews complemented both the observations and survey results by allowing guides to provide greater context for the kinds of actions that were both observed and/or self-reported. The early interviews also helped to shape the format and delivery model for the survey instrument. Furthermore, interviews allowed for guides to express individual experiences, observations, and concerns about their industry. These three methods, although each valid in their own right, complemented each other and increased the depth of understanding that was possible from this study.

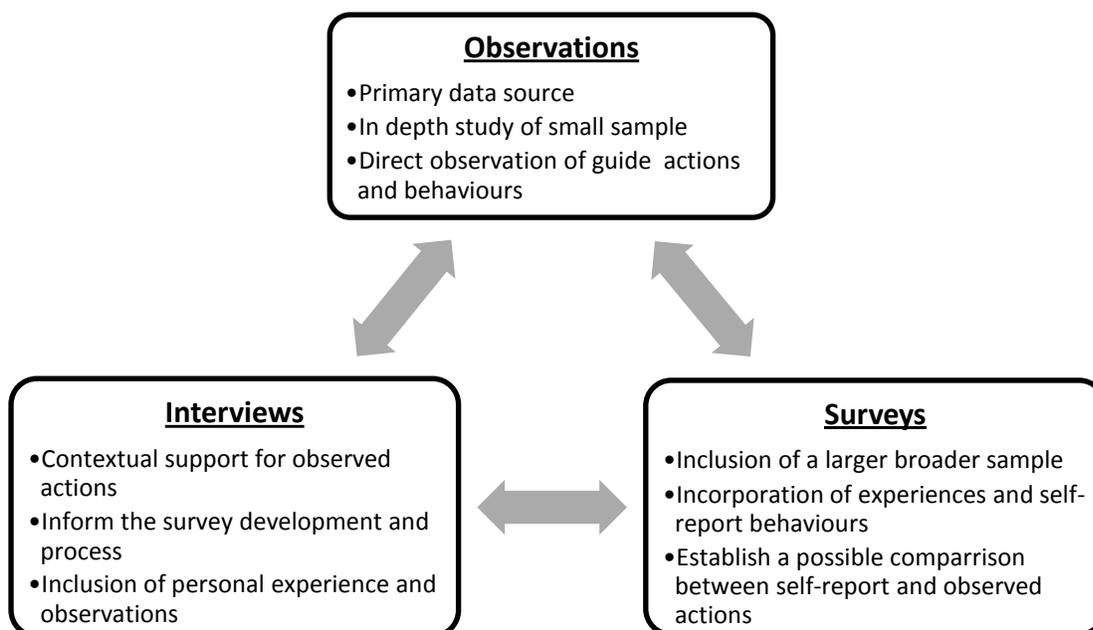


Figure 1. Figure 1. Methodological framework with expected contributions.

The following section further explores the observational, survey, and interview methodologies that were utilized in this study.

Participant Observation

Again, the observation of sea kayak guides in the field was the primary component to this research. In order to use this approach without influencing the actions of the guides, participation on commercial trips needed to remain unknown to the guide. This meant the researcher participated in full day and multiday kayak trips under the guise of an average sea kayak client.

Geographic Area

Vancouver Island was selected as the main focus area for this study. The island is one of the main paddling areas for the province of British Columbia and exhibited the highest concentration of commercial sea kayaking operations in the province, at the time of this study. This study area also offered the highest potential for success given the temporal and financial constraints associated with this research project.

Within the geographical area of Vancouver Island four main paddling regions were identified for in-field observations. These four regions were: Vancouver Island West, Vancouver Island North, Discovery Islands/Desolation Sound, and Vancouver Island South.

Vancouver Island West was defined as the waters located on the west coast of Vancouver Island suitable for commercial sea kayak operations. This area included paddling destinations such as the Broken Group Islands (within Pacific Rim National Park) and Clayoquot Sound in the southern limits, and extended north to the Brooks Peninsula and Nuchatlitz Provincial Park at the northern end. Vancouver Island North included trips and operators located on the northern end of Vancouver Island and surrounding islands (primarily the northeast). Premier paddling destinations in Vancouver Island North included the Broughton Archipelago and Johnstone Strait; included the Robson Bight Ecological Reserve. The third geographical grouping was the Discovery Islands and Desolation Sound; the island chains and coastal areas located directly east of Campbell River. Although Desolation Sound is located on the coastal mainland of British Columbia, access is often attained through the Discovery Islands. The final regional grouping was Vancouver Island South which included the waters surrounding Sooke and Victoria extending northeast to incorporate the Southern Gulf Islands, including Gulf Islands National Park.

Each of these regions exhibited higher concentrations of commercial sea kayak operators and were well known in the paddling community as popular paddling destinations around the island. Within these areas were a range of land zones which included but were not limited to: Crown Land (public), Indian Reserve, National and Provincial Parks, Marine Parks and Ecological Reserves. Observations for this study were made within a combination of these differing land classifications; each of which has different rules and regulations for operation within its zoning.

Sample Selection

In-field observations were used to observe the specific behaviours of seventeen guides, from twelve different operations, during full day and multi-day day trips (full day trips were defined as greater than 4 hrs. in duration). As there was no comprehensive database of sea kayak operators in BC, a convenience sampling method was used to select subject operations. Multiple resources (i.e. internet, telephone books, visitor information centers, etc.) were used to generate lists of possible sea kayak companies in each particular geographic area of interest. These companies were then contacted by an email that inquired about trip availability and schedules for the given timeframe (usually a predetermined two or three week period of time) for the area.

From the companies that responded, trips were selected according to the fit with the existing schedule. This selection method allowed for the number of observation days in each area to be maximized, while simultaneously limiting the number of travel days and distances.

This selection method also allowed the study to encompass operations that varied in size, expense range, and operational structures. Companies selected also included operators with and without membership in the various professional organizations, which allowed for the sample to include member and non-member guides. Finally, the sampling method used eliminated preferential selection based on company prevalence in the industry or those previously known by the researcher.

Participant Observer (Instrument)

In order to allow for discrete observation of the guides, it was important for the researcher to appear as an average client. Trips were registered for by telephone or email contact and no face to face contact was made prior to trip departure. The researcher arrived on the scheduled date with the gear specified on the operator's packing list. In addition, the researcher attended all pre-trip meetings and followed the specific packing instructions for each trip, ensuring to make some mistakes commonly made by inexperienced

paddlers (e.g. packing bulky items, leaving extra space, or overfilling dry bags). When asked, the researcher admitted to having some kayaking experience but it was limited in geographical area or style of paddling (i.e. white-water); this allowed the researcher to demonstrate some skill and efficiency, while still explaining his presence on the guided trip (these are two common reasons for joining a guided tour). In addition a proficiency in backcountry camping was expressed which further justified the level of comfort exhibited during camp situations.

During each trip the researcher was careful not to influence decisions made by the guides or the group. In order to ensure that each trip was uninfluenced by the research objectives, the researcher remained impartial towards all decisions about activities, destinations, and daily objectives or trip focus. Once decisions were made, the researcher participated in the chosen activities, along with the other clients, whether it was on or off the water. This included, but was not limited to, hikes, evening paddles, educational activities, and free time. The researcher offered assistance to the guide with camp-based activities (dishes, cooking, fire starting) if other clients did as well.

At no time during the regular schedule of the trip was the purpose of the study, or the identity of the researcher as a professional sea kayak guide revealed to clients, or the guides. However, it was established prior to the study that should a complicated situation arise that compromised group safety, professional assistance would be offered and the dataset would be abandoned.

Data Collection

A base structure of observable topics was created prior to the start of the field seasons. This framework included observations and desired information to be collected on general guide demographics, wildlife interactions, camp site selections, and overall camp management (see Table 1 for more detail). Notes were made, as possible, on each of the categories experienced during the particular day and written out in an abbreviated format. Not all categories were available for observation on a daily basis; often due to environmental conditions (i.e. absence of wildlife, or fires hindered by weather conditions) or incompatible daily objectives (i.e. long-distance travel days). All observations were documented in a waterproof journal based on the categories outlined above and data was collected throughout the full duration of each day and trip.

Table 1. Observations by category for field observations of active sea kayak guides.

Category of Observation	Included Observation
General Guide Information	<ul style="list-style-type: none"> • Number of years guiding • Number of years with the company • Certification (organization and level) • Training background and education
Wildlife Interaction	<p>Intertidal life</p> <ul style="list-style-type: none"> • Instructions for client behaviour • Species observed • Species handling (what and method) <p>Marine mammals and birds</p> <ul style="list-style-type: none"> • Distance from mammals/ birds • Strategies employed for group control • Instructions to clients • Noise control
Break/Camp Selection	<p>Launching/landing locations</p> <ul style="list-style-type: none"> • Substrate of the beach • Distribution of marine life • Instruction to clients for landing • Frequency of use for the site <p>Overnight camp locations</p> <ul style="list-style-type: none"> • Camp set up (general area) • Tent pad substrate and location • Land zoning and permits • Presence of permanent structures • Frequency of use (site specific)
Camp Management	<p>General camp practice</p> <ul style="list-style-type: none"> • Shelter construction and permanent structures • Food controls (i.e. bear hangs) • Cooking method (heat source) • Water source • Kitchen clean-up and waste control • Instruction for travel around camp <p>Human waste management</p> <ul style="list-style-type: none"> • Instructions given (method and content) • Method of management (cat holes, pits, etc.) • Disposal of sanitary supplies (i.e. toilet paper) <p>General waste management</p> <ul style="list-style-type: none"> • Disposal of paper waste • Disposal of food scraps • Disposal of garbage • Recycling <p>Camp fires</p> <ul style="list-style-type: none"> • Fuel (type, size, source)

-
- Location of fire
 - Construction or containment strategy
 - Method of clean up
 - Before and after comparison

Post-camp impacts

- Garbage and waste
 - Trail development/ erosion impacts
 - Fire impacts
 - Overall natural appearance (or that of arrival)
-

Notes were recorded a minimum of twice daily; once upon the establishment of, or return to camp, and again upon the completion of guide-led activities for the day. These notes were made in the privacy of the researcher's tent (on the final day of trips notes were made in the researcher's vehicle prior to departure). Additional notes were taken throughout the day when time and privacy permitted. At no time were notes made in the visible range of guides or clients.

Photographs (using a Nikon P100 digital camera) were taken to further document environmental interactions during the day while on the water and at points of interest. Pictures taken served as an aid for note taking about events that had occurred earlier in the day. When it was not appropriate to use a notebook, pictures were taken to document specific events or actions. At a later time, each day's photographs were reviewed and used as a trigger to remember key elements of each day's observations. All photos were downloaded and saved along with the corresponding set of notes.

Data Analysis

Data was compiled and entered into Microsoft Excel to create a database for analysis. To accomplish this, a spreadsheet database was created in Excel, showing the twelve trips observed along the X-axis, and the observed criteria (Table 1) descending the Y-axis. Each cell was then filled with the corresponding information from trip observations, and results were tallied. Data for these tours was then interpreted through descriptive statistics (frequencies, averages, etc.) which were computed using the Microsoft Excel statistics function. Additional, non-quantifiable, information was sorted according to themes. This qualitative data provided valuable context and insight into guide behaviour as it pertained to the observational categories.

Survey

Participant Selection

The survey portion of this study was open to all sea kayak guides who actively guided trips in British Columbia. This was designed to incorporate not just lead guides, but also those participating in assistant guide roles in the industry. Similarly, the survey included guides from all geographic regions of the province as well as those with varying levels of certification and levels of experience. The only excluding factor was age for participation. Guides must have been 19 years or older to participate in this survey. This parameter coincided with the age required for certification by both major kayak organizations.

Distribution

Multiple distribution methods were used to invite guides from around the province. As a generally migratory population, it was difficult to predict where guides would be living at any given time during the collection phase of the survey. Similarly, many locations of employment and living arrangements were remote areas with limited means of contact or communication. The multiple methods for distribution were incorporated to attempt to off-set the difficulty of communication with the given population. As such, methods of distribution included:

Personal invitation: Throughout the season the researcher personally invited guides encountered during travel and trip participation. All guides encountered throughout the study were invited either at that time, or contacted later in the season if conditions were not suitable. Invitations took place in geographic areas after observations had been completed.

Business invitation: During the season, visits were made to operators around Vancouver Island. These operators were asked for their assistance with the distribution of the survey amongst their guiding staff. Each operator was left with the necessary information to allow their guiding staff to participate in the survey; hard copies with postage paid envelopes or website information for an online version (needs varied depending on location and remoteness of the operation).

Organization invitation: Some professional organizations assisted in the survey distribution through their membership emails or social media pages. This method of distribution was limited by the number of organizations who chose to assist the study.

Email invitation: Some participants were invited through email invitation. This occurred for companies and guides who were known to be operational, but personal contact was not possible during the season.

Referral invitation: All participants were encouraged to invite their guiding associates to participate in the study. As no database exists of guides, this allowed for some lesser known or difficult to contact guides to receive invitations.

All participation in the study was voluntary and remained anonymous (or confidential if identifying information was voluntarily provided within the survey responses). Furthermore, there was no consequence for withdrawal at any time during the survey.

Instrument

The *2011 Sea Kayak Guide Survey – Environmental practices* was created specifically for this study (Appendix B). As no previous studies had been found reflecting the application of environmental practices by sea kayak guides, there was no readily available survey that could be adapted for this study. The purpose of this survey design was to collect data surrounding the knowledge, attitudes, and behaviours of sea kayak guides relating to their potential impacts on the environment. The survey provided an opportunity for guides to share personal experiences from their day-to-day guiding activities, which increased the depth of knowledge gained through this study.

Similar to the observation component of this study, the development of this survey included information collected from a variety of sources including: the field of recreation ecology (e.g. Cole, Monz, Twardock); various professional organizations' suggested low impact practices (SKGABC, ACSKG); and leading programs for low impact travel and research, (i.e. *Leave No Trace*). Through consultation of these sources and the addition of industry professionals and their experience, the following five categories were identified as key areas of importance with regards to impact management:

- Wildlife Interactions
- Site Selection
- Camp Management
- Waste Management
- Client Education

In addition to the above categories, basic information was collected on guide experience, as well as individual respondent perceptions of the industry with regards to environmental standards. Questions were formed using a variety of measurement strategies including, nominal (select those that apply), ordinal (ranking), interval (Likert scale), and open-ended queries. Survey design literature was consulted

to select appropriate question formats for the final survey format. Through a combination of question formats the 38-question survey was created and hosted using Vovici survey software.

Data Collection

Data collection for the survey used internet hosting provided by Vovici online. This web based program collected and organized the survey data for the duration of the data collection. Participants, who chose to complete the survey electronically, were given a small invitation card which contained the web address for participation. Further instructions were provided on that webpage.

A secondary format, print copy, of the survey was also available to all guides. For many guides, internet access was limited during the season. As such, the paper version of the survey provided an alternate method for participation. All print copies were later entered into the Vovici program upon their return to the researcher. This ensured the standardization of all data collected throughout the survey portion of the study.

This survey remained active through the high and post seasons of 2011 (June to November). This schedule accommodated those who were unable to participate during the high season of the summer months.

Data Analysis

All survey data was analyzed using one of two programs. Vovici software created basic statistical analysis and findings in the form of a general report. This software provided frequencies from the respondent data. SPSS (statistical software for the social sciences) was used to run additional statistics as well as verify the results from the Vovici generated report.

Open-ended questions and additional information were analysed through theme sorting (similar to that done for the study's observations). This process identified commonalities amongst responses and grouped them together to reveal overlapping information and opinions. This provided a method to incorporate the content from questions and answers that were not suitable for statistical analysis.

Limitations

Effective distribution of this survey was the most recognized limitation. As established as the industry is, there is no current database of active guides in British Columbia. Therefore it was not possible to determine the percentage of guides who were successfully contacted, or what percentage of those contacted chose to respond. Secondly, the mobile lifestyle of the guiding community severely restricted the contact and confirmation of contact of many individuals. Finally, not all of the organizations originally involved, chose to distribute this survey to their members and withdrew their assistance at the time of distribution. These organizations expressed a concern for “survey fatigue”, among other logistical issues. These factors further increased the likelihood that limited numbers of guides were presented with the opportunity to participate in the study.

Interviews

Interview data was collected during the 2010 and 2011 field seasons to further the investigation into environmental practices. Fifteen industry professionals participated in documented interviews for this study. Interviews took an informal and unstructured format in order to accommodate the comfort levels of all participants; some participants showed hesitation towards formal audio/visual recording during the interview. These industry professionals were interviewed in a variety of settings and group sizes ranging from individuals to groups of three. These interviews were conducted independent of the observations within this study.

Participants

As mentioned, fifteen industry professionals (i.e. guides, owner/operators, professional organization representatives, etc.) participated in the interview portion of this study. Participants represented all levels of involvement within the sea kayaking industry including, past and present guides (of differing certifications levels and organizations), business owner/operators, certifying organization representatives, and members of regional land use planning committees. Individuals, who showed interest in the subject matter, were invited in person by the researcher throughout the two field seasons. Once briefed on the study parameters, the industry professionals were engaged in discussions regarding their personal experiences and opinions, as well as other information they wished to provide on the general topic of environmental practices. Interviews were voluntary and no compensation was provided.

Informal Interview

An informal and unstructured interview process was selected for this research. Broad categories and subjective categories replaced the use of specific question sets and predetermined prompts. General topics regarding environmental practices were presented to the interviewee(s) and discussion was allowed to ensue. This format allowed for each participant to express the specific concerns they felt were most pressing. If a point had come to a natural conclusion, participants were encouraged to discuss additional aspects or topics related to environmental practices in sea kayaking. Key comments and points were reiterated back to the interviewee to confirm the accuracy of their meaning.

Interviews were conducted in locations and settings most convenient for the participant(s). All interviewees expressed a preference for the informal interview setting. As such, locations included coffee shops, sea kayak businesses, restaurants, and park settings. Interviews ranged in duration from fifteen minutes to 90 minutes and were scheduled at the convenience of the participant. Interview durations were also at the discretion of the participant.

Due to the sensitive nature of the subject, some participants were concerned with the matter of anonymity. In order to ensure the anonymity of the participants, electronic recording devices were not used. Formal recording during the interview process was limited to pen and paper. Post-interview, notes were elaborated on to ensure key elements, themes, and messages expressed through the process were captured effectively.

Data Analysis

Interviews were treated as supplementary data in this study. Information was sorted thematically, and used to augment observational and survey data.

Results

The results below are reported according to the method in which the data was obtained. As mentioned above each of the three methodologies applied to data collection, played a different role in producing this study's results. Observations were treated as the main focus of the study and responsible for producing an in-depth view of guide actions while in the coastal wilderness. Guide surveys were designed to capture less detailed, but valuable data from a broader sample of guides. Results from both of these methods have been provided in the following section. Interview data was considered a supplemental form of data collection and has been included in the discussion section that follows the results section of this paper.

Observations

Guide Demographics

During the summer sea kayaking seasons of 2010 and 2011, seventeen sea kayak guides were observed guiding trips with clients. These guides were observed individually or in pairs on twelve trips around Vancouver Island. Employers were responsible for designating guides to specific trips which allowed for a diverse range of guide's and guiding characteristics that were beyond the control of the researcher (summarized in Table 2). Level of experience (measured in number of seasons as a guide) ranged from those in their first season to some who had been guides for more than twenty seasons. Guides from the two main professional organizations (SKGABC and ACSKG) were represented. The Sea Kayak Guides Alliance of BC showed the highest membership level with 88% of guides observed having achieved some level of certification. Only one member from the ACSKG was observed, while the remaining guides chose to work without a professional certification.

Observations were geographically dispersed around three of the four geographic regions of Vancouver Island. Vancouver Island North, the fourth region, had fewer active operators for the given seasons of observations. Additionally this area was primarily a multi-day trip location and as such offered limited options for single day trips. These together resulted in fewer opportunities for observations to be made in this geographic region.

Table 2. Characteristics of guides observed. N=17.

Characteristic	Number Observed	Percent (%)
Gender		
Male	14	82
Female	3	18
Experience (seasons)		
1-3	9	53
4-6	2	12
6-8	1	6
10+	4	24
	†1 unknown	
Certification		
SKGABC	15	88
ACSKG	1	6
None	2	12
Guides by Region		
Vancouver Island West	4	24
Vancouver Island South	5	30
Vancouver Island North	2	12
Quadra & Discovery Isl.	6	35

† 1 guide did not provide information on number of years guiding.

Wildlife Interactions

Interactions with wildlife proved to be an important element of nearly all sea kayaking trips within this study. Whether the trip was multiple days or just a few hours, there was an onus placed on the guide to provide opportunity for guests to encounter various types of wildlife. Website marketing, trip descriptions, and information packages often expressed wildlife interactions as an important element of the tours. Images of whales and marine mammals, intertidal marine life, sea birds and eagles were commonly used to portray the experience to be had by clients. In many geographic areas of BC, this was the sole marketing factor behind successful trip sales (e.g. “kayak with the orca whales in the Johnstone Strait”). Beyond marketing these messages of wildlife interactions were further echoed by office staff during reservation phone calls, pre-trip meetings, and packing prior to departure. Not surprisingly, every guide observed expressed the presence of wildlife as a significant element to the kayaking experience that they provide.

On the water, only one of the twelve trips had a primary focus that did not include wildlife encounters (trip was geared towards kayak skill development). The remaining eleven tours incorporated wildlife

viewing as a primary objective within the tour. This research found the types of wildlife interactions could be placed into three broad categories: opportunistic, travel delay, and planned and programmed observation.

In the opportunistic approach, wildlife interaction was a focus that superseded other objectives at the given moment. Here a circumstance presented itself for high probability viewing of “glamour” wildlife. For example, if whales were known to be in the area the route would be adjusted to maximize this exposure; all other objectives were put on hold (finding camp, historical/cultural content, intertidal marine life, etc.). One of the guides described wildlife interactions as being a sort of “checklist”. His explanation follows:

Each trip starts out with a blank checklist comprised of all the things that a client might want to see, or might be impressed by. Some of the things on the checklist are more rare than others. For example, seaweed and sea stars are plentiful and easy to find, but the same cannot be said for an orca or humpback whale. If the opportunity arises to check one of the more rare species off the list, a guide must take that opportunity; the rest can be found later (Observed Guide, 2011).

A second manner in which wildlife interactions were incorporated was during travel delays. Often trips experienced weather, current or tidal conditions that impacted the safety and ability of the group to travel. Wildlife interactions were used as a time-filling activity through the in-depth exploration of intertidal zones, coastal flora/fauna and general exploration of the intricate shorelines accessible only by small boats. During these times guides commonly extracted species from the water and used interpretive techniques to educate clients about coastal ecosystems.

The third way in which wildlife encounters occurred was through the intentional route planning and programmed inclusion of wildlife rich areas. This type of interaction was based on animals that were encountered during the day’s planned paddling route and was often the primary objective of the day. In this approach, wildlife was found during general travel and became the focus of activity. Guides found a point, or place, of interest and stopped to share it with the group. This proved to be a useful technique for including the more predictable or slower moving species (e.g. seals and intertidal life). Overall, this was the most common method of wildlife interaction. During single day trips guides often mentioned the “usual spots” for finding certain species, clearly indicating the route was planned around locations frequented by easily accessible wildlife.

Intertidal Life

Intertidal life played an important element of the majority of trips in this study. However, there were significant variations between trips and guides (possibly due to differences in geographic area, anthropogenic influences, tidal levels, and daily objectives). Despite this, nearly every trip focussed on intertidal life with encounters that ranged from observation without touching, to guides holding and presenting species, and in some cases clients collecting individual animals for viewing. Of the twelve trips, only one trip did not provide intertidal life interactions which were likely due to anthropogenic influences on the shoreline, and tidal depths (animals that were present were at a significant depth beyond that which clients could clearly observe). Ten of the remaining eleven trips included the handling of one or more species. Observations recorded a large variety of species handled throughout these trips (Table 3).

Table 3. Intertidal marine species observed and/or handled during commercial sea kayak trips.

General Group	Common Name	Species	Encountered or Observed
Sea stars	Ochre sea star	<i>Piaster ochraceus</i>	Handled
	Sunflower star	<i>Pycnopodia helianthoides</i>	Handled
	Leather star	<i>Dermasterias imbricata</i>	Handled
	Bat star	<i>Asterina miniata</i>	Handled
	Blood star	<i>Henricia leviuscula leviuscula</i>	Observed
	Brittle star	<i>Species unknown</i>	Handled
Sea urchins	Red urchin	<i>Strongylocentrotus franciscanus</i>	Handled
	Purple urchin	<i>Strongylocentrotus purpuratus</i>	Handled
	Green urchin	<i>Strongylocentrotus droebachiensis</i>	Handled
Crabs	Northern kelp crab	<i>Pugettia gracilis</i>	Handled
	Red rock crab	<i>Cancer productus</i>	Observed
	Dungeness crab	<i>Cancer magister</i>	Observed
	Shore crabs	<i>Various species</i>	Handled
Jellies	Moon jelly	<i>Aurelia labiate</i>	Handled
	Red-eye medusa	<i>Polyorchis penicillatus</i>	Handled
	Lion's mane	<i>Cyanea capillata</i>	Observed
Other	Sea cucumber	<i>Parastichopus californicus</i>	Handled
	Nudibranchs	<i>Species unknown</i>	Observed

This study found that some species were handled more frequently than others (Figure 2). Ochre sea stars, common purple or orange sea stars, were observed and discussed by guides on eight of the twelve trips. On six of these eight trips (75%), the sea star was removed from the water to be examined more closely by clients. This was common practice within the sea kayak industry and in most cases allowed for educational information and interpretation to be provided. Despite being significantly more delicate and susceptible to anthropogenic harm, other species were handled at a higher frequency when encountered. This included green sea urchins, leather stars, and sun stars which were handled 100%, 80%, and 80% of the time encountered respectively. Although Leather stars are found in high numbers and were presented as durable, green sea urchins and sunflower stars require more cautious handling; unfortunately cautious handling was not always presented by guides. Sea cucumbers were also handled frequently when encountered on trips. In most cases these were handled with care, but some guides demonstrated more harmful handling techniques for this creature. Additional intertidal animals were observed and/or handled, but at significantly lower frequencies than the above mentioned. In many cases of encounters, guides attempted to handle the animals, but the depth of water made this impossible. Overall it appeared that access to animals was the biggest determining factor in whether or not an animal would be handled.

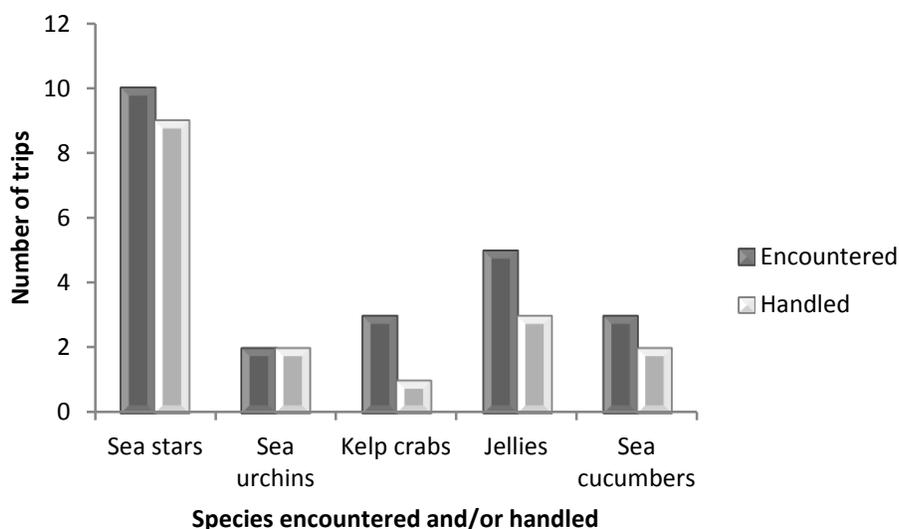


Figure 2. Intertidal life encountered and/or handled by guides on the twelve observed trips.

Species Handling Techniques

Variation was also discovered about how guides interacted with the individual species. Nine of the ten intertidal species that were identified by guides on trips were physically handled. The individual species handled by the various guides were: sunflower, ochre, leather, bat, and brittle stars (*Pycnopodia helianthoides*, *Piaster ochraceus*, *Dermasterias imbricata*, *Asterina miniata*, *sp. unknown*); red, purple, and green sea urchins (*Strongylocentrotus franciscanus*, *S. purpuratus*, *S. droebachiensis*), kelp crabs; moon and red-eye medusa jellies (*Aurelia labiate* and *Polyorchis penicillatus*); and sea cucumbers (*Parasitochopus californicus*).

Sea stars were the most commonly encountered creature on the tours. In the majority of situations (66% of all tours) guides passed the sea stars around for clients to touch and hold. An additional two trips allowed for clients to touch the sea stars, while the guide remained in control of the animal. One individual guide exhibited total control of the marine life, where interpretation was provided, but clients were instructed to look without touching. All guides took the opportunity to educate clients on the basic anatomy and biological facts about sea stars. This was done through a variety of styles and techniques, but overall the educational component was well done. Approximately 50% of the guides also included clear instruction on handling and how to reduce human impact on the animals. The return of these species to the water was commonly handled with care. Seven of the twelve tours had guides who returned animals to the location from which they were extracted; instead of another location. Conversely, two tours instructed clients that stars could be dropped anywhere or at any depth.

Sea cucumbers are considered, among guides, to be a more delicate species for handling than most of the echinoderms observed during these trips. Guides showed a clear interest in attaining a sea cucumber for clients when possible (tidal conditions permitting). When sea cucumbers were handled, guides were generally conscious of the animals' welfare. However, one of the four guides observed handled the species in manner that was less considerate to the animal. This particular animal was kept out of the water for an extended period of time while being passed around unsupported with little to no instruction about handling. Upon completion of the interpretive talk, the animal was dropped back into the water at a depth similar to that of its original location. The other three guides to handle this species did so in a much more careful way. These animals were well supported, kept wet with sea water, and returned to the ocean in a timely fashion. These three guides, from different companies, discussed the importance of minimizing the stress to the animal with emphasis placed on the animal's unique defense mechanism of intestinal abandonment. With this explanation handling, touching, and time were all limited and clients appreciated the shorter experience.

Other intertidal species were handled similar to those described above. The majority of guides treated species in a respectful manner, with great care being exhibited for the animals' welfare. Despite some occurrences of over-handling, no guides were observed acting, or allowing clients to act, in a manner known to be harmful to the wildlife.

Techniques for Minimizing Impacts

Although most guides chose to handle marine life with bare hands, a few guides used some excellent techniques for minimizing contact with and impacts on the animal (and in some cases the guide as well). The two notable techniques used were methods used to create a physical barrier between the handler, and the animal itself. Two of the seventeen guides observed used a neoprene diving or paddling glove while handling marine life. The simple neoprene glove was worn prior to handling wildlife for clients and removed afterwards. In both cases the glove was worn on the single hand which handled the animal, while the other hand remained un-gloved and used for pointing to body parts while discussing functions. These gloves were used solely for handling wildlife and were not used while paddling.

A second technique employed for minimizing impact to marine species was the use of specimen jars or containers. A simple glass jar was used to allow for animals to be removed from the larger marine environment while still being contained in sea water, and untouched by human hands. This was used primarily for small jellies or nudibranchs, and allowed clients to safely see the species from different angles while not directly influencing the animal. Furthermore, the animal was able to be gently passed around the group with ease, as opposed to the difficulty associated with of manoeuvring boats to view a free floating animal.



Marine Mammals

Larger marine mammals are often of considerable interest to the clients on the commercial trips. As such, in most cases, these were given a high priority for client-wildlife interaction (for a summary of those encountered during observations see Table 4). Seals were a common occurrence on eleven of the twelve kayak trips and were considered by guides to be a “near guarantee”. However, other marine mammals were much less common and became a high point of interest when the opportunity to view them occurred.

In situations where marine mammals were present, large amounts of time were spent in a stationary position to view these animals. With the exception of seals and occasional river otters, all marine mammals were in the water when found. This meant that the duration of the encounter was largely up to the mammal, as its speed and direction of travel were the determining factors.

Table 4. Marine species observed during commercial sea kayaking trips.

General Group	Common Name	Species
Whales and porpoises	Humpback whale	<i>Megaptera novaeangliae</i>
	Dall's porpoise	<i>Phocoenoides dalli</i>
Seals and Sea lions	Stellar sea lion	<i>Eumetopias Jubatus</i>
	Harbour seal	<i>Phoca vitulina</i>
Otters	River otter	<i>Lontra Canadensis</i>
	Sea otter	<i>Enhydra lutris</i>

Whales and porpoise were consistently treated with proper respect and viewing guidelines outlined by WhaleWise (a collaborative program including the Department of Fisheries and Oceans) were strictly adhered to. Encountered on three of the twelve trips, Humpback whales and Dall's porpoise were a great highlight for sea kayaking clients. In all situations, the guides expressed the importance of the guidelines, distances, and behaviours for viewing these species with impact reduction as a key element. Distance was always maintained at greater than 100 meters (approximated by the researcher as specific measurements were not possible). Viewing guidelines were clearly explained prior to engaging in viewing activities. Despite being asked by clients, and seeing recreational paddlers encroaching on the animals, the guides observed always ensured that their parties did not get within directional, or distance limitations for proper whale watching as laid out by WhaleWise. According to clients, whale sightings were the highlights of these trips and the strict rules placed on them for viewing did not affect their experience.

Unlike many of the other marine mammals, otter sightings were far less predictable by guides. Although not uncommon, encounters with the two species were short in duration as the animals would be in transit and stationary behaviour was limited. When the animals were on rocks (river otters) time was spent floating adjacent to the shoreline observing the animals as they travelled or ate. At no time did guides attempt to attract the animal's attention, and guests were content with just floating in silent observation. No additional instructions seemed necessary for viewing these animals.

Harbour seals were the most commonly sighted marine mammal with sightings on 92% of trips. Encounters of this species ranged from haul-out sightings (seals on rocks) to seals swimming amongst the boats. In some circumstances instructions were given to maintain a specified distance from the animals when they were on the rocks, but specifics were not regularly declared. With the abundance of these animals on the coast, guides expressed the impossibility of maintaining the recommended 100 meter distance from them at all times. As a mammal that inhabits the near shore, it was frequent for the kayaks to round corners and be instantly within 50m of hauled out seals. In areas of common sightings, guides were careful to give a wider berth around blind corners, and requested clients to proceed with care. Specific instructions about boat manoeuvring (e.g. do not to point boats directly at the animal) were rarely given. However, one guide ensured that kayaks travelled in a path that if seals were present, they would be scared into protected waters, and not out to the depths where predators were common. Unfortunately the same guide later encouraged close encounters with a seal colony for pictures. The initial cautious behaviour displayed was certainly not universal among observed guides, and observations revealed that overall consistency within a single guide was lacking.

For example guides who had generally sound practices often encouraged close proximity photo opportunities for clients with hauled out seals in the background. On numerous occasions this led to seals being scared off their haul-outs back into the water. This was most notable in areas where sea encounters with harbour seals were common and populations were abundant. This example represents the inconsistency with regulation, client instructions, and rule enforcement demonstrated by sea kayak guides during this research.

Birds and Other Sea Life

Bird encounters were not of high significance during the sea kayaking trips. Sea and shore birds were observed, but were generally treated with little regard by guides. Viewing guidelines, as per WhaleWise, suggest the same parameters of 100m from marine birds on land. However, it was uncommon for guides to adjust a route to avoid impacting birds on sea or nearby rocks, or to accommodate client viewing. In some situations, birds remained on their perch, but in the majority of situations were scared away from their location.

Eagles were the most commonly viewed and discussed bird on tours. At the beginning of trips these birds were frequently pointed out and factual information was presented to clients. However, their abundance on the BC coast caused them to be less exciting by the end of the first day, and as such they were no

longer granted observation time. At this point time was only allocated to watching eagles engaged in hunting. One particular event had an eagle eating fish on shore, and kayakers were allowed to go within five meters for photos. This particular eagle did not seem to care, but was aware of the human presence. The guide encouraged this behaviour and was “impressed” by how close the group was able to get.

Seaweeds were the final category of marine life that received regular attention on tours. Although not an animal, seaweed was regularly discussed by guides while resting, or waiting for a change in tidal conditions. Bull kelp (*Nereocystis luetkeana*) was the primary species used for discussion as it played an important role in First Nations life as well as the balance of the marine environment. This species was encountered on all but one trip, and was handled on four of the twelve tours. When handled, the seaweed was harvested and presented to the clients. In many cases the float and stipe were used as a horn or trumpet, and the leaf like structures were frequently eaten. One guide encouraged the collection of various seaweeds to take home and eat at a later date. An additional five trips discussed bull kelp but did not remove a sample from the water.

Site Selection

Launching and Landing zones

Launching and landing sites were the locations where kayakers had the most direct impact on the shoreline. Anthropogenic effects on these sites were intensified by the high volume of travel in concentrated strips of shoreline while boats are landed, unloaded, and moved up or down the beach. During this study a total of 47 different launching and landing zones were used. Site purposes included arrival at camp locations: lunch stops, points of interest, and start and finish points of trips. Repeat use of the same launching and landing zones were not included unless the beach substrate altered with tidal differences. Also, additional sites were used for washroom breaks, but were not included in the study as not all clients landed boats at these locations.

Guides were responsible for selecting the most suitable locations for bringing boats and clients on and off the water. Various factors may have been involved in the decision process. Some of these included tidal and weather conditions (primarily tidal height and wave affect), geographical region (some areas dictate the type of beaches present), proximity to camp locations, and beach substrate. Different circumstances changed the apparent priority of these conditions (i.e. sheltered areas would lower the importance of weather impact). The most prominent or consistent factor involved was for the protection of the kayakers. On all but two trips clients were instructed to approach the shoreline with care and stop their boats prior

to contact with the shore. From this point guides would either lift boats towards the shore, or instruct clients to disembark while still floating. The reason expressed for this process was to preserve the fiberglass and gel coat finish on the bottom of the kayaks. No guide linked the cautious approach to minimizing the environmental impact on the beach.

Combined with this, was the factor of beach substrates. Substrate refers to the surface makeup of the shorefront itself where boats were landed. Of the 47 recorded landing sites, seven distinguishable categories of substrate were identified. These categories were mud, sand and pebble, small rock, boulder, rocky shelf, cement structures, and floating docks (Table 5).

Forty-seven percent of all landings occurred on a beach substrate comprised of small rocks. Rocks in these areas were the size of a human fist or smaller (less than 10 cm in diameter). This was the most frequently found substrate on the sections of BC that were paddled during this study. The second most commonly used substrate, with 26% of sites, was sand and pebble beaches. This appeared to be the most favoured substrate by guides and was selected wherever available. One mud bottom beach was used, but was disliked by the guides at the time as it was difficult to move and was messy; tidal and weather conditions dictate the use of this particular site. Other substrates were used as required. Boulders were not a preferred selection and were only used as a last resort or weather dependent landing. Rocky shelves similarly were seldom used, and were selected when higher tides eliminated other beach options, or simply there were no other beaches present.

Human structures also comprised some of the launching and landing sites. Docks were a preferred location where available. Seven of the 47 (15%) sites used were company docks. Company docks were often the start and end points of tours, but additional docks were occasionally used throughout the tours. Other man-made structures were less commonly used. For one occasion a boat ramp was used and was done so because recreational users occupied the beach immediately adjacent. Cement boat launches were explained as having a high level of impact on the construction of the kayaks being used, and therefore were avoided where possible. Three different tours used beaches within 10 meters of a cement boat launch.

Table 5. Beach substrates of launching/landing sites used during commercial sea kayak trips. N=47.

Substrate	Description	Frequency	%
Small Rock	Small rocks less than 30cm in diameter	21	45
Sand and Pebble	Sand and small pebble; includes crushed shell	12	26
Docks	Any floating structure buffering shore from water	7	15
Rocky Shelf	Solid rock outcrops or shelves; minimal loose rock	3	6
Boulder	Boulder beaches; rocks greater than a 30cm	2	4
Mud	Mud bottom; only encountered at low tides	1	2

Beaches used for launching and landing during the twelve trips were generally void of obvious marine animals. Only two beaches had abundant wildlife in the form of barnacles, crabs and sea stars. Little or no mention of shoreline wildlife was discussed with clients, with the exception of concern for human welfare such as the risk of slipping, getting barnacle cuts, or stepping on sea urchins. The welfare of shoreline integrity was never presented as a guide concern.

Camping Sites

Camp sites (tent locations) varied throughout the research period. Tents were per person (or per couple) on all trips requiring a significant amount of space designated for each tent. Beaches, forests, grassy fields, and established camp pads were the types of campsites selected by guides during the six overnight trips. In total nine different camping locations were used for the six trips taken (many sites were used more than once within the same trip). Within these sites, guides may have presented more than one option for tent set up (i.e. beach or field). Only two of the trips chose to move sites every night, while the rest used a basecamp model of touring, where one single site was used for multiple nights during the trip.

Client and guide tents used a total of 35 different sites on varying substrates (Table 6). Of these, the most frequently selected location for camping was in the forest, within close range of the beachfront area. Here campsites fit into two different categories: previously established sites, or user's choice (sites not previously used). Previously established forest sites were those that had designated and cleared tent sites. These locations may have been created and maintained by one of the park services (Parks Canada, BC Parks, etc.), or were established by the operators and guides for specific use by themselves and their clients. Forest campsites were the preferred choice regardless of whether previously established sites were present. Over 51% of all sites were located within the forest canopy. Of these 18 sites, only two of them were not previously established.

The second most utilized type of tent locations were open grass fields. Here a large open area was designated for the group and clients were allowed to choose their individual tent location. Thirteen tents were set up in grassy fields; this represented 37% of all tent locations throughout the research season.

It is important to note that in many circumstances, camping location were designated by the given land authority. According to National and Provincial park regulations, camping was often restricted to sites designated for overnight use. This was encountered in Gulf Islands National Park and the Broken Group Islands (Pacific Rim National Park). In these areas camp location was not at the full discretion of the guide. Similar situations existed on various lands controlled by First Nations.

Table 6. Tent site substrates used during commercial sea kayak trips. N=35.

Campsite Type	Subcategory	Frequency	%
Forest	Pre-established	16	51
	Users choice	2	
Grass Field		13	37
Beach		1	3
Established Pad		3	9

Camp Management

Camp management included all activities that took place during camp activities. This included all kitchen management, cooking, waste and human waste management, and client behaviour controls.

Kitchen Management

Cooking and Food Management

On all trips the primary heat source for cooking was a two burner stove. Five of the six kayak tours used a two-burner propane stove, while the additional tour used a two-burner white gas stove. Guides for groups greater than four people, deemed a two-burner stove essential. Arguably, the overall complexity of meals being prepared required the use of multiple burner stoves regardless of group size. Three of the tours also carried at least one small white gas stove as a backup heat source (often this was carried in the guide's emergency or essential personal gear). On only one occasion was this secondary stove put to use

for cooking purposes. It is assumed the three remaining tours carried these stoves as backup heat sources, but they were not seen.

Food storage was uniform across all six overnight trips. Kayak hatches were used for storing all food and scented products overnight. Clients were instructed to put all scented products (e.g. toothpaste) along with all food products (personal or group) into the sealed hatches of the sea kayaks for the night. Garbage, recycle and compost bags were stored in the same manner, but were generally isolated in a single hatch which contained no food products.

Dishes were also processed in similar fashion on all six trips. Collapsible bags or buckets were used to collect seawater for washing. This water was heated using the stoves and small amounts of soap was added. It was difficult to determine what soap was used, but the guides all expressed the importance of biodegradable or marine specific soaps. Four of the six tours used a dual-bucket system, one for washing, and a second cold-water bucket for rinsing. Dishes were then left to air dry unless required immediately in which case drying cloths were used. Prior to washing clients or guides rinsed the dishes in the ocean to remove any remaining food particles or sauces. This allowed the guides to minimize the volume of seawater required for washing. Once all dishes were washed, most guides disposed of gray water below the high tide mark or directly into the ocean itself. On a single occasion gray water was dumped on site and in an area that would not be cleansed by the following high tide.

For single day trips that provided lunch, dirty dishes and all waste was collected and transported back to the business location for cleaning, and or disposal. No food related impacts were noticed on beaches upon group departure.

Client Hygiene

Client hygiene stations were not standard on the six overnight trips. Two of the six overnight trips encouraged clients to maintain hygiene by having washing stations in the kitchen area. Washing stations included, hand soap along with a container or hanging water bag for rinsing. Hand towels were also provided for drying. On these two tours a verbal reminder was made before each meal for clients to wash their hands thoroughly. Bathing was not stressed on any trip, but was left to the discretion of the client. The other four trips offered hand sanitizers with bathroom kits, but none were present in the food area.

Kitchen Facilities

Areas used for kitchen activities were constructed upon arrival in all trips with the exception of one location. Guides created cooking and serving platforms using driftwood and found items along the beachfront. In most situations guides were familiar with the particular site making the construction of the kitchen seemingly routine. Materials such as plywood and flat boards were often stored in hidden areas from use on previous trips. This allowed for the hasty construction of a well-functioning kitchen area familiar to the guide(s). In addition to the natural materials, one tour carried a small collapsible table used for meal preparation and serving. Tablecloths were commonly used to transform natural materials into a formal serving platform, while the rest of meal preparation took place on open wood structures. If rain protection was required, tarps were fastened to adjacent trees using thin rope.

One tour operated using pre-established camp locations. These spots were officially leased, or designated by the land owner to be used by the individual operation. Kitchen sites in these locations had tarpaulin canopy structures that were permanently strung over large areas for dining and meal preparation. Cooking structures included elevated shelves for cooking and meal preparation shelves with elevated hooks for storage. In some areas rain barrels were also present for water collection. Dining facilities included picnic tables and other manufactured seats for clients. Construction materials for these locations were boated in pre-season for construction. Tarps were left in place for the duration of the season. These structures were built in place and there appeared to be no intention of future removal. Even with the presence of commercially manufactured picnic tables), clients often opted for beachfront seating created from camping cushions and driftwood.

In contrast, the most simple kitchen structure was a tablecloth draped over a large flat stump or flat rock. This method was observed on two of the twelve tours for dinner, and was the primary method of serving lunch time meals on all tours. Seating in these events was on driftwood, beach rocks, or grassy fields. Clients showed a preference for this style of dining providing the weather was favorable.

Kitchen Waste

Kitchen waste refers to all waste created on trip with the exception of human waste and associated products. This includes paper scraps, food scraps, food preparation byproduct and packaging, etc. Waste management was of little concern on single day trips, but was a priority on multi-day trips. All guides on these longer trips expressed differing degrees of concern for kitchen waste management. Four multi-day trips sorted garbage into three separate containment bags. Garbage, compost, and recyclables were

separated on trip for disposal upon the return to the office site. In these cases, garbage bags were extremely small considering the size of the groups, while recyclable containers made up the bulk of the waste material.

Composting was used to varying extents on the different trips. Although bags were carried on multiple trips, they were not always used to their fullest extent. Food sourced from the sea was often cleaned, and disposed of back into the ocean environment. Guides justified this to clients as food for the crabs, and it being a natural disposal for the product. One guide also encouraged the disposal of biodegradable waste from fruit products into forest or marine environments. The guide explained that a few fruit peels would not impact the vast wilderness. In addition multiple guides scraped and rinsed dishes directly into the sea without removing excess food leftovers (remains after client dining). Contrasting this, a different guiding team exhibited careful scraping of this form of food waste into the garbage, which resulted in minimal waste entering the natural environment. The majority of tours, kitchen waste and other sources of organic waste were collected and transported back to be disposed of in company compost units.

Recycling and waste reduction was common on all trips. This took place through reduced packaging prior to trip departure, the use of alternate reusable containers such as Tupperware, and the collection of recyclable products for later disposal. All aluminum, tin, and plastic products were cleaned, compressed, and carried back to base for proper disposal. Paper products were dealt with in one of two ways. Primarily paper and cardboard waste was collected with other recyclables (plastics, aluminums, tin products) and transported back for municipal recycling programs. However, where space in boats was a concern and camp fires were being used, paper packaging was burned in campfires. This became common practice where excess packaging existed and fires were permitted.

All additional waste was brought back to the operation's base to be disposed of through company or municipal means. On no occasion were guides observed leaving waste behind at a campsite or other location.

Human Waste and Personal Hygiene

Human waste and personal hygiene practices were observed over the twelve trips, but were of greater concern for the multiday trips. Areas of observation included the method of disposal of human waste, disposal of hygiene products such as toilet papers and feminine hygiene products, and the practices associated with oral care.

Human waste was observed being handled using four distinct methods. The most common was the use of outhouse or pit toilet facilities. In a number of highly used areas, and the majority of national and provincial parks, pit toilets had been installed for kayaker and visitor use. This included some permanent camp structures built by individual operators for their clients. In the presence of these units, clients were informed of the locations and the proper use of these facilities (procedures involved in the case of composting toilets). Toilet paper was disposed of in the toilet; however feminine hygiene products were collected separately. Four of the six overnight tours had pit toilets available at all camping locations.

Cat holes were used on only one overnight trip where pit toilets were not available. Clients were instructed to dig a hole on the backside of the small island for burial of human waste. Once filled in, the location was to be marked with a stick to prevent other clients from using the same spot. Toilet paper was kept in a paper bag and burnt below the high tide line by the individual. Techniques for the successful use of a cat hole were discussed and demonstrated by the lead guide at camp on the first day. Clients found presentation to be humorous and informative as it was the first experience with cat holes for many of them. A bag containing the essential items (toilet paper, lighter, hand sanitizer, and a trowel) was kept in a central location of camp.

The third method used on a single trip was a “poop tube” device. This was a human waste collection method for the complete removal of all solid human byproducts. A black PVC tube, sealed on both ends, was carried at all times on the back of one of the kayaks. Clients were instructed on how to use the tube and it was kept centrally at each camp. An accompanying dry bag had the essential items (coffee filters, brown paper bags, hand sanitizer) for the proper use of this system. The instructions for the use of this system were unclear and clients were left confused about its proper use. Regardless, all human waste ended up in the tube that was then returned to the office for pick up and proper disposal. On this tour all paper and hygiene products were removed in the tube.

The final method of waste disposal was for non-camp related sites. This included lunch stops, breaks, and hikes where the above-mentioned facilities were not available. In these situations ten of the twelve tours encouraged the use of the intertidal zone. This was included as instruction for both urine output and bowel movements. Some guides expressed that the use of intertidal zones dispersed the byproduct and diluted the urine to a level that had no impact on the ecosystem. The two additional tours encouraged the use of the forest floor or areas above the tidal zone (referred to by one guide as the “facilitrees”). Hand sanitizer and toilet paper were carried at all times and were provided to clients for sanitary reasons. There was no discrepancy among guides on this practice and it was often presented as an industry standard. The

guides that used cat holes mentioned above, expressed preference for the intertidal method for all situations, but due to local aquaculture were not permitted in their immediate area.

Toilet paper was disposed of in two ways when not able to be disposed of with the human waste. The primary disposal method was open burning. In most cases the client was responsible for burning their own toilet paper immediately after use with a personal lighter. Burning was encouraged below the high tide line and on the wet seaweed or rocks. The second method used was a group-burning format. This was done when supplies were running low and there were an insufficient number of bags for individual burning to occur. Toilet paper was then collectively burned in a campfire, or added to the communal garbage. Feminine hygiene products were always collected with the garbage, which was disposed of later at the business location.

The brushing of teeth was always conducted in the intertidal zone when clients asked guides about the best location. However, if no questions were raised about this, there was no instruction given to clients and teeth were brushed in random locations (forest, beach, fire pit, etc.). It did seem that in most cases clients would repeat or mimic the actions of the first person to do so. After a question was posed, the simple instructions to clients modified the client behaviour accordingly.

Campfires

Opportunities for camp fires did not occur on all trips. Weather conditions and fire bans were limiting factors on many trips. Of the six overnight trips, campfires occurred on five, with these being a nightly event on two of the five. Weather conditions prevented successful fires from being a regular event on an additional two trips; this was a result of heavy rainfall and the inability to find dry fuel. Client desire was not always an inclusive factor in the decision to have campfires. In two of the five trips, the campfires were started on a nightly basis without consultation of the guests. It appeared as though fires were automatically included in all tours from these guides. On the other three trips with fires, clients either requested a fire, or were included in the decision process. If clients showed no interest, the fire was cancelled for the night (often on wet nights, or ends of long days). The sixth trip did not have campfires, which was due to park regulations. In that particular park there is a year round fire ban. The two guides on that trip expressed their enjoyment for fires, and noted the restrictions as being the primary reason for not having a fire.

Fire Practices

One fire practice found to have general consistency among guides was the use of fire rings. Where fire rings were present (commonly used recreational and private sites), they were used with high regularity among the guides. For the six observed overnight trips, fire rings were used for 80% of the fires.

However, at no point during the five trips were new rings constructed. Despite this, many areas still showed the proliferation of multiple fire rings including the areas primarily used by guided tours. The redundant construction of multiple fire rings is something that has been documented as a commonality among recreational camping areas and cannot be directly attributed to the guiding community.

Regardless of the damage to aesthetic values, no rings were dismantled on any trip.

In the single case that did not have a ring present, no ring was constructed, and general *no trace* fire protocols were followed. This fire was kept relatively small and was located below the high tide line with no formal barrier. A small depression was created within the pebble substrate to house the fire. Some larger pieces of wood and rocks were placed on the windward side to create a barrier from the wind, but were dismantled post-fire.

Fire starting varied between guides and conditions. Three of the five guides regularly used fire starting aids to light fires. The preferred aid was paper, or cardboard packaging from food items. The unassisted fires were started using shavings and kindling formed from cedar driftwood. This fuel was readily available at all fire locations and was the preferred method of more experience guides. Conversely one guide was observed using white gas to assist the ignition of wet wood. In this isolated situation a significant volume of white gas was poured over the wet twigs on two separate occasions to attempt a successful fire. It eventually ignited, but was generally an undesirable and unnecessary fire; conditions were neither favorable nor pleasant for client enjoyment.

Fuel was a primary concern among guides regarding fires. Commonly used beaches had limited, or no driftwood suitable for fire burning. On three tours, firewood was collected during the daily paddle and transported back to camp for the evening fire; this was common practice for heavily used areas. At no time was fuel (other than fire starting material) collected from locations other than beachfront areas. Where fuel was available, or once it had been collected, larger wood was split and sized down prior to burning, although it often remained larger than wrist diameter (LNT best practice). Guides used hatchets, axes, and strong knives for splitting wood (primarily cedar). This was done for both starting fires, and again for resizing wood prior to burning. No logs or large pieces of wood were burnt on any trip.

The terminus of campfires did not show practices consistent among all guides. Two of the five fires were burnt to a complete ash, with little remains to be redistributed along the tidal zone, or left if within a fire pit. The other three fire managers failed to burn the product down to a complete ash. These three guides left charred material in the fire pit with little or no post-fire cleanup. Stacks of unused wood were left beside the fire pits, but may have been for future fires on other trips. When checked the following morning, used fire pits were rarely cleaned.

One of the six trips had guides who performed effective no trace fires on a nightly basis. These fires were held below the tide line, burnt to a fine ash, and redistributed by the tidal currents throughout the night. The following mornings there were no visible evidence fires had taken place. Other guides had incorporated some elements of no trace fires within their practices, but failed to include all of its principles. In order to ensure the execution of a proper no trace fire was a success, meticulous attention on the part of the guide was required from construction to completion.

Camp Travel

Movement around camp was not a common concern to guides within this study. Method and direction for travel around locations was usually left to the discretion of the clients. Occasional reference was made to existing paths when directing clients to specific camp areas or outhouse locations. Otherwise movement around camp locations was never discussed within the group regardless of the camp area.

Despite this lack of information, clients tended to use existing paths providing they were clearly developed and convenient. However, if paths were unclear or more convenient options were present, main travel ways were disregarded and shortcuts were created. This was clearly observed in three different camp locations where clients chose their own paths between the beach and their tent locations resulting in visible erosion and ecological impact.

Many of the campsites used during this study had clearly developed and marked trails. This was accomplished by trampling and trimming foliage, marking trails with shells and rocks, or signage indicating directions. These trail tools were placed by parks personnel, land owners, or kayak users depending on the situation. When in place these were clearly effective and seemed to be an efficient replacement for verbal instructions.

The absence of clearly marked trails caused clients to wander and create their own travel ways. With little direction from guides on how best to navigate these areas, clients chose the option that offered the

shortest distance. In 25% of tours this led to the use of unsuitable travel paths, including eroding slopes or sensitive foliage. This not only resulted in environmental damage, but could be considered a risk to the participants where falls and injuries were realistic outcomes. Alternate and more suitable options were always found within close proximity, but were unknown to the client users.

One particular example showed significant erosion development within the timeframe of two days of camping activities by a small group on a specific site. This was a previously unused camp location, but the distinct development of common travel paths between tents and the kitchen, as well as the kitchen to the beach, became evident by the time of final departure. Prior to this group's use, the area in question was pristine, with no signs of human use present.

Summary

The observations described above were the first and primary focus of this study. The discrete observations made have provided a clear picture of what practices are being utilized by guides as they operate in the field on a daily basis. All guides displayed a careful understanding and respect for the environment in which they work. Guides, in most circumstances, displayed a desire to leave the area in the same pristine condition that it was in upon the group's arrival. However, like anything there were areas observed where improvements are possible and impacts can be lessened. These results will be further discussed later in this report, with additional insight and supportive data gained from the survey and interview components of the overall study.

Survey Results

Survey Respondents

The 2011 Sea Kayak Guide Survey on Environmental Practices had 43 respondents through the 2011 paddling season and following two months (June through November 2011). Guides reported a range of experience from first year guides to those with greater than 30 years guiding experience. Although all levels of experience were represented by respondents, lower numbers were recorded for guides with greater experience. The highest concentration of respondents (44%) reported one to five years of experience (Figure 3). Further evaluation showed the average experience level of guides was 8.85 years, with a mode of 3 years. The overall range in experience accounted for 347 cumulative years of guiding experience, and included some guides who operated in the early years of commercial sea kayaking in British Columbia waters.

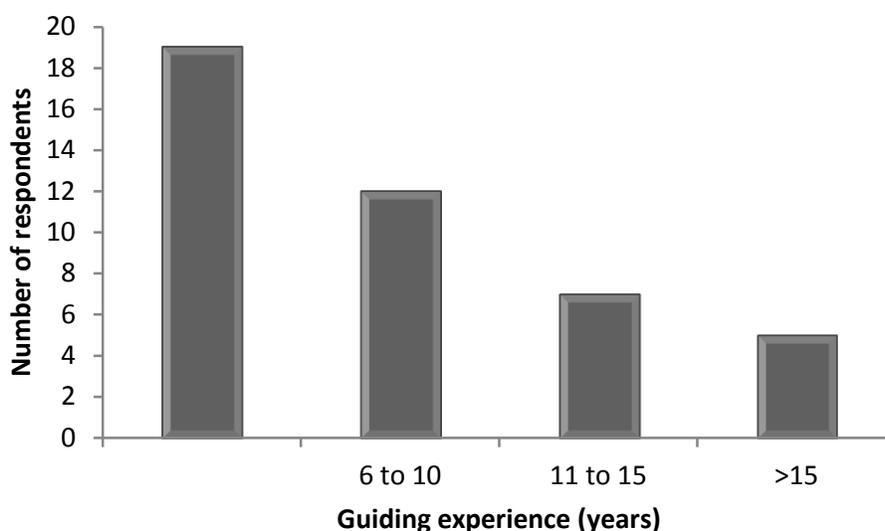


Figure 3. Number of years of experience of respondent sea kayak guides.

Respondent association with the two main professional organizations was also well distributed in both membership and level of certification (Table 7). Twenty-nine respondents maintained membership with the *Sea Kayak Guides Alliance of BC* at the time of this study. Of this group, memberships were distributed through five levels of certification. Assistant overnight guides and Level three (full guides) were the two levels of certification with the highest number of members (12 and 13 respectively); this was to be expected as these are the two commonly required certifications for BC's more popular tour

areas and often are paired together as a guiding team. Three guide respondents held entry level certifications with the SKGABC. Two guides had level two certification and the remaining two guides had a Class 4 endorsement (recently added and currently the highest level of certification with the SKGABC).

The *Association of Canadian Sea Kayak Guides* showed the second largest representation in this study with nine members spread among the three tiered certification system. Here, eight assistant guides, two full guides, and two guides with Class 3 endorsement (their highest level of certification) responded to the survey. Not all respondents chose to specify the level of their certification, but indicated overall memberships. Four of these guides had dual-memberships, meaning they held memberships with both of the above organizations.

Beyond guiding certifications, Paddle Canada, an organization offering skill based certifications, had seven members. Again, members with this certification frequently overlapped with certifications from the above professional guiding organizations. Three other recreational level programs were also reported as certifications held by guides; only one of these was accompanied by a professional guiding certification, while the remaining two did not hold commonly recognized professional guiding certifications.

Table 7. Guide held certifications by organization and level. N=43.

Sea Kayaking Association	Level of Certification	Frequency	Percent (%)
Sea Kayak Guides Alliance of BC		29*	67.4
	Level 1 (Day guide)	3	7.0
	Assistant Overnight Guide	12	27.9
	Level 2 Guide	2	4.7
	Level 3 Guide	13	30.2
	Level 4 Endorsement	2	4.7
Association of Canadian Sea Kayak Guides		12	27.9
	Assistant Guide	8	18.6
	Full Guide	2	4.7
	Full Guide – Class 3	2	4.7
Paddle Canada		13	30.2
Other Organizations		4	9.3

*Not all guides chose to indicate the level of their certification.

Of the 43 respondents, seven did not have an active guiding role in BC waters for the current season. Many of these guides actively participated in the industry through managerial and ownership roles within their operations (with sporadic guiding days), or by guiding in different countries for the study season (ex. Alaska, Belize, etc.). Despite not guiding within the given geographical range and temporal constraints for the current season, the experience of guiding in BC of these guides was considered relevant and valuable data information for this study. These guides were well versed in kayak guiding in BC, and had a wealth of experience from previous years.

Guides were further asked to report their primary guiding region(s) given a number of geographic choices around British Columbia. Out of 55 responses, 33 (60%) primarily guided on Vancouver Island; by sub region this was Northern Vancouver Island (12), Western Vancouver Island (11), and Southern Vancouver Island (10). Northern BC/Sunshine coast combined for six respondents (13.9%), while an additional five guides reported Haida Gwaii as their primary guiding area (Table 8). Additional guiding regions identified by limited numbers were Vancouver/ Lower Mainland, the Interior of BC, Labrador, and Alaska. Some guides identified more than one area as a primary guiding region due to employment by multiple operators, or operators that offered trips equally distributed throughout the season. Some areas also had multiple access points and as such may have resulted in some misrepresentation of the guiding region (access point vs. geographic location of trip). The figures found through this sample reflect those found in an unofficial industry study conducted in 2009 (Simmonds).

Table 8. Primary geographical guiding region of respondents. N=43.

Primary region of Guiding Activity	Frequency	Percent
Haida Gwaii	5	11.6
Northern British Columbia and Sunshine Coast	6	13.9
Vancouver/Lower Mainland	4	9.3
Southern Vancouver Island	10	23.3
Western Vancouver Island	11	25.6
Northern Vancouver Island	12	27.9
Other	4	9.3

* Respondents were able to indicate more than one region.

Along with geographic region, guides selected from a number of categories to indicate the land zoning (i.e. private, national park, etc.) of their particular guiding area (Table 9). Twenty-eight guides indicated

Crown land as the primary land zone used by their operations. Provincial and National parks were the second most commonly reported land zones with eighteen responses each. Land managed by First Nations peoples, marine conservation areas, and private land exhibited lower response rates with 10, 8, and 7 responses respectively. Only one participant was unaware of the land zone they were guiding in. Again multiple responses by individuals were possible as kayak tours often crossed a variety of land zones within a single tour. For example it was common for a kayak trip to begin on Crown land, travel through a park (provincial, national, or marine) and camp on Indian Reserve.

Table 9. Primary land zoning for guide led trips. N=43.

Land Zone Type	Frequency	Percent
National Park	18	41.9
BC Park	18	41.9
Private land	7	16.3
Crown land	28	65.1
Indian Reserve	10	23.3
Marine Conservation Area	8	18.6
I don't know	1	2.3

* Respondents were able to indicate more than one zone.

The respondents from this survey illustrated the tremendous diversity likely found in the sea kayak guiding community. Given the limited information on the size of the kayak industry, there is no way to know if this small sample size was representative of the whole population. However, it is obvious that this survey has captured guides who range in experience levels, memberships and training, as well as geographic regions that each likely come with specific management considerations.

Guiding Behaviours

The second series of questions were designed to collect data regarding guiding behaviours. Guides were asked to self-report about their practices and decisions made while guiding paying clients in BC waters. Information was collected on the three distinct categories used during the observation portion of this study. These categories were: interactions with wildlife, site selection (launching/landing and camp), and camp management.

Wildlife

Wildlife interactions are an important element of sea kayak trips. An opportunity is presented for guides to seek out creatures that vary significantly from those encountered in the day to day lives of their guests. With this in mind, this survey asked guides to report on their practices and behaviours while guiding clients in environments shared with marine wildlife. Questions were tailored around existing practices and policies designed to reduce impact on commonly encountered wildlife. Different sections inquired about guides' regular practices when encountering intertidal marine life, as well as marine mammals and other wildlife.

Intertidal Life

Intertidal life offers an opportunity for guides and clients to get close to a variety of marine species, which often includes the physical handling of animals. Through the use of certain techniques and practices it is possible for guides to help reduce the impacts their group may have on the given animals they encounter. One technique often used to reduce the overall impact is through the restriction of species that are handled. When handling intertidal life, 31 guides (72.1%) reported restricting the species handled, to those that are considered more abundant and less fragile than others (ex. purple sea star). Of this group fourteen reported this as a strict rule on all trips, while an additional seventeen reported often enforcing these restrictions. The remaining thirteen respondents indicated seldom or never restricting the handling of intertidal life to specific species (Table 10).

A second method often used by guides to reduce impact and harm to intertidal sea life, is through the minimization of the number of specimens being impacted. Twenty-five out of the 43 guides indicated they selected specific or individual animals for the group to look at collectively. In this way, a single animal is selected, collected by the guide, and shared with the group under supervision. Nine of the 25 guides reported using this technique on every trip, while the remaining sixteen use it often. Alongside this strategy, when clients are not under the supervision of guides, 31 guides (72.1%) reported using a "look, but don't touch" policy, where clients are encouraged to observe species in the environment without touching or disturbing them. These two techniques are often used in tandem.

However, clients often desire to interact with intertidal life on their own, without the presence and assistance of their guides. Although significantly less common, four guides (9%) reported encouraging clients to touch, pick up, and hold intertidal life without guide supervision. However, only one of these guides reported encouraging this behaviour on every trip. Thirty-nine guides seldom or never encourage this behaviour among their client groups.

Table 10. Guide reported behaviour while interacting with intertidal marine life. N=43.

Intertidal life viewing behaviour	Response	Frequency	Percent
Encourages clients to pick up intertidal life unsupervised	Never	21	48.8
	Seldom	18	41.9
	Often	2	4.7
	Always	1	2.3
	No response*	1	2.3
Selects individual animals for the group to examine	Never	6	14.0
	Seldom	12	27.9
	Often	16	37.2
	Always	9	20.9
Encourages clients to look at, but not touch the animals	Never	3	7
	Seldom	8	18.6
	Often	24	55.8
	Always	7	16.3
	No response*	1	2.3
Restrict species handled to those more abundant or less fragile	Never	3	7
	Seldom	8	18.6
	Often	17	39.5
	Always	14	32.6
	No response*	1	2.3

* No response indicates respondents who chose to skip this question

Marine Mammals

Encounters with marine mammals have become one of the major attractions for paying guests and flood the marketing material with seemingly guaranteed sightings. The most predictable and therefore common place for mammal viewing is while animals are utilizing haul outs and rest locations. Guides were asked if they maintain a 100 meter distance while viewing marine mammals at haul out locations (in accordance with current BMPs and viewing guidelines). Thirty-six guides (83.7%) selected “often” or “always”, indicating they keep clients the minimum distance of 100m away from mammals at all times (Table 11). However, when asked how often guides allow clients to approach within 100m, providing they do not disturb the natural behaviour of the animal, 20 respondents (46.5%) indicated this as often or always occurring. With the question reconstructed in this way, only five guides maintained their original response which reported never taking clients within the 100m distance associated with marine mammal viewing guidelines. Finally, guides were asked if they would allow clients to get as close as they desired for photographing purposes. To this, five guides reported the seldom allowance of this behaviour, while the remaining 38 guides stated they never allow this to occur on their trips.

Table 11. Guide reported behaviour while viewing marine mammals with clients. N=43.

Marine mammal viewing behaviours	Response	Frequency	Percent
Keep the group greater than 100m from the animals	Never	0	0
	Seldom	6	14
	Often	20	46.5
	Always	16	37.2
	No response	1	2.3
Group is within 100m, but is far enough away that natural behaviour is not affected	Never	5	11.6
	Seldom	17	39.5
	Often	13	30.2
	Always	7	16.3
	No response	1	2.3

Maintaining a set distance from mammals can be difficult to enforce. Responding guides were asked if they used their own boats to ensure clients do not travel within the instructed distance (a common practice for setting barriers). Eleven guides reported the use of this technique on every trip, while an additional 24 reported often using it. The remaining five responses indicated the seldom use of this technique.

While distance is a regulatory factor, guidelines and suggested actions are also known for movement and behaviour while in the vicinity of marine mammals. One suggested guideline is to ensure boats never point directly at the mammals. Twenty-five guides reported ensuring clients follow this guideline on most or all trips. In addition nine guides reported doing this seldom, while the remaining guides never follow this guideline. Finally guides were asked about noise control while viewing mammals. Of the 43 guides, 29 reported always instructing clients to keep noise to a minimum while viewing mammals. An additional thirteen indicate frequent use of this instruction.

Other Sea Life Encounters

Breeding and nesting seasons provide excellent wildlife viewing, but also increase the impact kayakers may have on the animal populations. When asked if known breeding sites are avoided during peak breeding and nesting seasons, 41 guides (95%) indicated always and often doing so. When asked if guides increase their distance from shore when approaching blind corners and areas of restricted visibility, eight guides indicated always and an additional 28 indicated often taking this measure. The remaining guides reported seldom adjustment of their distance to shore during breeding seasons. Finally guides were asked if they would adjust beach location if wildlife was occupying the area. Six guides indicate that they would seldom adjust their beach selection on account of wildlife use. The remaining

guides all indicated they would always or often select new sites when faced with wildlife occupying the given beach site.

As wildlife encounters are not only from the kayaks, guides were questioned about their practices for wildlife viewing while on shore. Thirty-eight guides indicated they often arrange a guide-led exploratory walk when on land. Regardless of this activity, all guides reported educating clients about local animal populations and their habits while off the water. Nearly all guides (93%) encourage clients to beachcomb and explore the area surrounding camp. Lastly when asked about client instructions, 31 guides reported instructing clients to be mindful of their steps to avoid crushing molluscs. Twenty-six (60%) reported often or always using a “look but don’t touch” policy as well. As a general rule, the majority of guides (81%) also instructed clients to not touch birds or marine mammals if encountered along the shoreline (a common occurrence at select times of the year).

Site Selection

Site selection is an aspect of commercial kayaking trips that is often or always at the discretion of the guides. Specific camping locations, tent sites, and launching and landing zones are often decisions made at the time, and are often not determined prior to arrival or inclusive of previously known locations. Twenty five guides reported using the same sites for nearly every trip they guide. This could be due to geographic familiarity or restrictions in shorelines, specifications from employers (tenure or permits), or to accommodate known points of interest.

Camp location

Guides were asked to prioritize (rank) their preference for selecting an overall camping location. Through this there was little consensus as to the top priority among respondents. However, ten guides (23%) reported protection from the elements as the primary concern when selecting a suitable camping location; this was followed by the use of previously established sites with 21% of respondents. More prominent results indicated which factors were of least importance to guides. When looking at the lowest priority, 20 guides (47%) reported that site designation by an employer was the least important factor in their decision making. These numbers reported are based on frequency of response, which indicates the highest number of responses for each rank.

In order to assess the overall ranking of preferences, a scaling method was used. Each level of rank (1st, 2nd, 3rd, etc.) was first assigned a numerical value. These values were then multiplied against the ranks to

determine a cumulative numerical score for each variable. The highest value was then considered to be the highest priority or most favoured factor.

For example: If respondents were given three items to rank: their top choice would receive three points, the second choice would receive two points, and the last choice would receive one point. The total points for the first item would be tallied resulting in an overall score. This would then be repeated for each item and compared against each other.

These scores were translated into a representative percentile to present a more meaningful figure. When the rankings were scaled to incorporate all seven levels of selection, the priorities become more clear (Table 12). Protection from the elements and the use of established camping sites were clearly ranked the highest priorities among respondents with 18.0% and 17.5% of the possible scoring respectively. Minimizing environmental impact, site aesthetics, client comfort, and the availability of water, were in the middle ranging between 12.7% and 14.6% of responses. However as with the un-scaled analysis, selecting a site designated by an employer remained the lowest priority when selecting camp locations (9.4%).

Table 12. Factors involved in camp site selection as ranked by responding guides. N=43.

Camp Site Decision Factors	Scaled Score	Representative Percent
Elemental Protection (shelter from the weather)	199	18.0
Using established sites	194	17.5
Minimizing environmental impacts	162	14.6
Site aesthetics	159	14.4
Client comfort	147	13.3
Proximity to water	141	12.7
Site designated by employer	104	9.4

Tent sites

Guides were asked to rank seven commonly found substrates in order of preference for setting up tents. Here, 35% of guides selected established camping pads as their highest preference for a tent location. Sand or gravel followed this as the second most frequent response. To better understand how the different substrates compared as overall preferences, the scaling model was applied to obtain a more comprehensive understanding (see description in previous section).

Four preferred tent site substrates were identified through the overall ranking analysis (Table 13). Established camping pads remained the first overall (19.9%). However, this was closely followed by

sand or gravel camp sites (19.5%). Beyond this forest floor and grassy fields were the next two preferred camp locations with 18.4 and 17.5 percent of the possible scoring. At this point a significant decrease in scoring existed between these first four substrates and the remaining three. Cobblestone beaches (9.8%) and rocky shelves (9.3%), despite being the suggested substrate for minimizing environmental impact, were unpopular choices for tent locations. Not surprisingly, sea grasses were by far the least preferred tent site with a minimal 5.7% preference rating.

Table 13. Tent site substrate preferences as ranked by responding guides. N=43.

Tent Site Substrate	Scaled Score	Representative Percent
Established camping pad	223	19.9
Sand or gravel	219	19.5
Forest floor	207	18.4
Grassy field	196	17.5
Cobble stone (small boulder)	110	9.8
Rocky shelf	104	9.3
Sea grasses	64	5.7

Launching/landing sites

Launching and landing sites require specific decisions to be made on the part of a guide. Many factors may influence the decisions made to get the group of paddlers from the sea to the shore. Guide respondents were asked to prioritize six different factors that can affect landing/launching site decisions. As could be predicted, safety was the most frequent first priority when selecting a launching/landing site. However, it was followed closely by ease of access or approach. Environmental protection did not rank as the most important element when selecting sites. Only eight guides reported environmental impact as one of their top three priorities when selecting a site for launching and landing a group of boats.

Again response frequency does not necessarily give the most accurate indication of overall priority (Table 14). To achieve this, the same scaling model was applied to determine the overall order of importance for the given options. The spread in representative percentages made this picture much more clear. Safety ranked the highest at 25.1%, with ease of access coming in second with 20.9%. Environmental impacts were found to be of little importance to guides, and received only 11.3% of the possible scoring. The only factor that was found to be less important was the protection of the kayaks themselves, which scored 10.1%.

Table 14. Importance of factors for launching and landing kayaks as ranked by responding guides. N=43.

Launching/landing Factors	Scaled Score	Representative Percent
Safety	191	25.1
Ease of Access/approach	159	20.9
Protection from the elements	131	17.2
Beach substrate	118	15.5
Minimal Environmental impact	86	11.3
Protection for boats	77	10.1

Large Group Size

Group size can often affect the areas utilized by guides, and change the amount and type of impact that may occur. A series of questions asked guides to report on certain practices given a larger group size of eight or more clients. When asked about guiding a large group 22, of the 43, guides reported often avoiding popular public sites when travelling with a large group. Additionally, five guides reported using less popular public sites with every large group. Ten of the remaining guides seldom try to avoid popular sites while guiding larger groups. However, when under the pressures of large groups, 35 guides reported always or often choosing more hardened sites for camping. Answers shifted when asked if they chose larger beaches and allowed the group to spread out along the beach extending the camping area. Twenty guides (47%) indicate often or always allowing groups to spread out along a widened area. The remaining 23 guides all reported seldom or never using this as a tactic for larger group numbers. Instead, they reported condensing their numbers into the same allotted space.

Camp management

Further questions in the survey were included to collect information on behaviour around camp settings. Camp locations are subjected to a great deal of impact that is concentrated in both location and time by any given group. How groups handle themselves in this setting can drastically affect the amount of physical impact left on the area. The following results express respondent behaviours in the camp setting.

Cooking and food management

Propane stoves were the preferred heat source for cooking on commercial trips. Twenty-five guides (58%) reported the use of propane stoves (primarily two burner stoves) as the primary heat source for cooking purposes. Those guides who chose to elaborate explained that two burner camp stoves were the most efficient and time effective way to cook for diverse group numbers. These guides expressed that

two-burner propane stoves are compact, reliable, and allow for no waste to be created through the use of five pound propane tanks. Because of these advantages, guides also felt these were the most environmentally conscious option available to them at the time. White gas stoves, and open campfires each received support from seven guides. White gas was often reported as a secondary heat source by those guides using propane as their primary. Guides using camp fires for their primary heat source expressed a preference for the added ambience, lower environmental impact, and the increased sense of adventure.

Food storage is the second major component to food management while sea kayaking. Often dictated by the type of trip and geographic area, guides reported kayak storage (63%) as the most commonly used food storage method. Bear boxes and other permanent structures for storage were preferred when utilizing base camps (i.e. camps in the Johnstone Strait). However the most common use for more mobile outings was the kayak storage. Bear hangs were also used when in bear territory and the additional precautions were deemed necessary. Guides did report that bear hangs can be a challenge given the quantity of food being packed on extended trips, and the limited selection of coastal trees suitable for a hang. Nine guides reported bear hangs as their primary control system.

Waste management is another element linked to food and cooking practices among guided sea kayak trips. Fifty-one percent of all respondents report packing out all kitchen waste products. Twelve guides (28%) reported they burn combustible waste, and pack out the rest. A common justification for this was the limited space in kayaks was required for packing the essentials, and waste could be safely eliminated on site. Only five respondents reported spreading organic materials in the wilderness, however additional comments suggest that fast biodegrading organics were the only ones being dispersed in the environment. Other alternatives provided by guides were deep water composting in remote areas, and intertidal zone dispersal, but were sparsely reported.

Table 15. Various kitchen management practices as indicated by respondents. N=43.

Kitchen Management	Frequency	Percent	
Cooking heat source	Propane Stove	26	60.5
	Gas Stove	7	16.3
	Camp Fire	7	16.3
	Missing	3	7.0
Food control	Kayak Storage	28	65.1
	Bear Hang	9	20.9
	Bear Boxes or Barrels	3	7.0
	Existing permanent bear control	1	2.3
	Other	1	2.3
	Missing	1	2.3
Waste management	Pack out all waste	23	53.5
	Burn combustibles, pack out the rest	12	27.9
	Burn combustibles, spread organics, pack out the rest	5	11.6
	Burn everything	1	2.3
	Missing	2	4.7

Along with trip-generated waste, 22 guides reported always picking up waste that was left by other parties. Only three guides indicated that they guide in areas where 3rd party waste was not a concern, and none needed to be removed. All remaining guides reported occasionally collecting waste that was not created by their trip.

Human Waste Management

Human waste is an area of sea kayak guiding that can either present a multitude of, or limited number of, options. Likert scale questions were used to determine the frequency with which different methods are used by survey respondents while guiding. When in the presence of an established outhouse, only 22 guides (51%) indicated they use it all the time (Table 16). Seventeen of the remaining guides often use it, but not always, while one guide reported never using outhouses, even when they are present. Beyond outhouses, guides were asked to report how often they use group latrines, cat holes, intertidal zones, portable toilets, and biodegradable bags (high current disposal methods).

Group latrines were not frequently used. One guide reported using them always, while the majority of guides (70%) reported seldom or no use of a group latrine. Cat holes were selected as more frequently used. Three guides indicated their use of cat holes on every trip, with an additional 11 guides reporting

they often used this technique. The intertidal zone for human waste was reported as used often or always by (63%) of respondents. Only three guides reported never using the intertidal zone for human waste. Portable toilet devices were used by a small number of individuals. Those that did report using portable toilets reported using them all the time, whereas the remaining guides never used these devices. Four of the survey respondents reported using some form of portable toilet devices on every trip; the remaining guides do not employ the devices. Biodegradable bags were the least used option. Six guides reported having experienced these bags through seldom or limited use, but no other guides reported their use.

Table 16. Human waste management practices as reported by respondents. N=43.

Human Waste Management	Responses	Frequency	Percent
Outhouses and Pit Toilets (when available)	Never	1	2.3
	Seldom	1	2.3
	Often	18	41.9
	Always	22	51.2
	Missing	1	2.3
Group latrines	Never	14	32.6
	Seldom	15	34.9
	Often	10	23.3
	Always	1	2.3
	Missing	3	7.0
Cat holes	Never	11	25.6
	Seldom	16	37.2
	Often	11	25.6
	Always	3	7.0
	Missing	2	4.7
Intertidal zone	Never	3	7.0
	Seldom	10	23.3
	Often	15	34.9
	Always	12	27.9
	Missing	3	7.0
Portable toilets (boom box, sealing container for packing out human waste)	Never	21	48.8
	Seldom	14	32.6
	Often	2	4.7
	Always	4	9.3
	Missing	2	4.7
Biodegradable bags for high current disposal	Never	34	79.1
	Seldom	6	14.0
	Missing	3	7.0

In addition to washroom location and type, is how used toilet paper is managed. Nineteen of the respondents reported bagging all used bathroom tissue and hygiene products before packing them out with the tour waste. Beyond this method, thirteen guides encourage clients to burn their own waste, while the remaining guides reported bagging the waste, and burning it collectively.

When asked how clients are educated about washroom protocols and techniques, 30 respondents reported discussions with clients about washroom practices. The remainder reported often having discussions. One exception existed who never has a washroom discussion with clients. Seventeen of the respondents also reported the inclusion of mock-demonstrations with clients to illustrate techniques used for the given type of washroom protocols.

Fires

Fires were considered by 28 respondents (65%) to be an important part of any sea kayaking trip (Table 17). A series of Likert scale questions inquired about the fire protocols and practices of the respondents. Thirty-five guides (81%) reported always or often having fires below the high tide mark. This is the standard and recommended practise. Ten guides reported the regular construction and use of fire rings. These are generally not encouraged, but can be advantageous in high wind areas. Additional comments from guides explained the use of existing rock rings as standard practice among their tours, but never the construction of new rings. Twenty-eight respondents never carry a fire pan, while three guides reported always carrying this fire management tool. An additional five guides employed the use of a fire mound when constructing fires above the high tide marks.

Beyond the location of fires, guides were asked about the fire maintenance practices. Fuel size is recommended to be smaller in diameter than a person's forearm. Fourteen guides ensure this is true all the time, while an additional nineteen (44%) do so often. Nearing the end of a fire, cleanup and final burning is essential for proper fire practices. Twenty-five of the 43 respondents report always burning a fire down to a fine ash. An additional thirteen guides often complete this process. This leads into the next process of ash dispersal. Again, the survey found that 81% of respondents reported often or always redistribute burnt ashes along the intertidal zone, as per low impact suggested practices. Only four guides reported never redistributing ashes. Guides indicated that fire practices were often situational, and it is difficult to answer some of these questions conclusively.

Table 17. Fire practices of respondents. N=43.

Fire Protocols	Response	Frequency	Percent
Campfires an important part of an overnight kayaking experience	Yes	29	67.4
	No	11	25.6
	Missing	3	7.0
Ensure all wood is burnt to a fine ash	Never	1	2.3
	Seldom	2	4.7
	Often	14	32.6
	Always	25	58.1
	Missing	1	2.3
Fuel is always smaller in diameter than your wrist	Never	2	4.7
	Seldom	6	14.0
	Often	20	46.5
	Always	14	32.6
	Missing	1	2.3
Ash is redistributed over the intertidal zone	Never	4	9.3
	Seldom	3	7.0
	Often	12	27.9
	Always	23	53.5
	Missing	1	2.3

Alternatives to campfires to create the same ambiance and setting were suggested by multiple guides. Some of the methods included placing tea lights (small candles) inside brown paper bags to create the affect. The use of olive oil with a toilet paper wick inside a tuna can, or the use of flashlights or camp lights with a bowl to create a similar glowing light (add paper flames for affect) were presented as effective alternatives.

Client Behaviour at Camp

Clients are one potentially large source of significant environmental impact around camp settings. There is often unsupervised free time while guides complete other duties, leaving guests unaware or oblivious to the impacts associated with their actions. As such some questions were asked about client actions around the camp setting. Twenty-one guides instruct clients to use established trails when moving around the camp area. An additional seventeen guides often give these instructions. This totalled 38 guides who often or always give clear instructions to remain on established paths and trails. Some guides (5) go further and always instruct clients to stay on the beachfront, and not to venture into the forested areas. Twenty-five additional guides report often giving this instruction, although it is not clear if this is for

environmental impacts, or for safety reasons. Finally, 21 of the respondents often or always give instructions on noise levels while camping. The remaining guides seldom feel it is necessary or important enough to issue group instructions for the camp setting.

Role as a Guide

Personal Attitudes and education

All but one respondent agreed or strongly agreed (84%) that environmental protection is important for their job. A similar result came as 23 respondents selected “strongly agree” when asked if they act in the best interest of the environment while guiding. To further explore this concept, guides were asked to report their impressions of personal actions towards promoting sound environmental practices.

Ninety-eight percent of respondents reported the use of good, environmentally sound practices. When asked where they learned about their practices, the two most reported avenues for official environmental education were through university/college or other educational institutions which represented 29 guides (67.4%), and professional associations/alliances (28 respondents, 65.1%). The next level of responses indicated current employers, and the Leave No Trace organization (48.8% and 44.2% respectively) as being responsible for their current knowledge of environmental practices. No respondents indicated having received no training (Table 18). Books and personal learning were also reported as a regular source of environmental education, but were done at the discretion of the individual guide. To ensure high levels of personal knowledge and environmental awareness, 93% of guides report continually working on improvement of their techniques for low impact touring. Interestingly, 15 guides (35%) were completely unaware that suggested environmental practices could be found on their professional organization websites.

Table 18. Source of formal environmental training of respondents. N=43.

Formal training received by respondents	Frequency	Percent
Sea kayak associations/ alliances	28	65.1
Universities, colleges or other educational institutes	29	67.4
Current employer	21	48.8
Previous employer	14	32.6
Leave No Trace program	19	44.2
No training	0	0
Other	4	9.3

Beyond personal learning, guides also encourage other guides and operators to learn about minimizing their impacts while participating in sea kayaking. When asked if environmental practices should be incorporated into guide training there was a favourable response (Table 19). The question was asked twice, once with reference to employer training, and a second time with reference to professional organization training, testing, and certifications. There was a stronger preference for the inclusion of training at the operation level as opposed to the certification level (business vs. certifying body). Employer guide training was strongly supported by 34 responding guides (79.1%). Thirty-six guides also reported the existence of environmental practices at their current place of employment, which are expected to be followed by the guides. Six guides were unaware of any environmental practices outlined by their current employer.

Professional organizations received comparatively lower levels of support, but still remained very positive. Twenty-eight guides (65.1%) strongly supported the incorporation of environmental training at the organization level. Three respondents disagreed with this notion that guide certification should be skill based and remain focused on the safety aspects of guiding; the remainder of guide education should be acquired elsewhere.

Table 19. Respondent opinions on formal environmental training. N=43.

	Response	Frequency	Percent
Environmental practices at current employer.	Exist and followed	36	83.7
	Exist but not followed	1	2.3
	Not aware of any	4	9.3
	None exist	2	4.7
Employers should incorporate environmental practices into staff training	Strongly disagree	1	2.3
	Disagree	0	0
	Agree	8	18.6
	Strongly Agree	34	79.1
Certifying bodies should incorporate environmental practices into guide training and testing	Strongly disagree	2	4.7
	Disagree	1	2.3
	Agree	12	27.9
	Strongly Agree	28	65.1

Education of clients

Forty-one guides agree (12) or strongly agree (29) they are role-models for the environment. As mentioned above, this consensus among guides agrees that they act in the best interest of the environment while guiding clients. When re-worded to incorporate the concept of ambassadorship, 42 respondents (98%) consider themselves to be ambassadors for good environmental practices. Detailed responses indicated the majority of these guides consider client education as an important aspect of their jobs. The many like-minded guides see it as their ethical responsibility to provide education to those who may not be aware of their localized or larger level impacts, or which practices are best suited for the given environment. Other guides reported it as a portion of their business contract; it is an element of why they are hired as a guide and expert in the field. Regardless of the reasoning, the respondents reported the positive connection between their jobs as guides, and the element of role models and ambassadors on behalf of the marine environment. As a part of this, 88% of guides agree or strongly agree that they take every opportunity to educate clients on how to minimize environmental impacts.

State of the Industry

Respondents were asked to provide their current assessment of the sea kayaking industry (Table 20). First guides were asked to rate the kayak operation they work for on a scale of 1-5 in terms of their environmental practices (1 being low and 5 being high). Thirty-one respondents (72%) rated their employing operation as a four or five (considered a positive response), with eleven responses indicating a five, the highest response possible. Only three guides reported their current employing business as being low (1 or 2). Respondents were then asked to rate the commercial sea kayak industry as a whole. This incorporated all guide and rental operations, without specific reference to an individual operation. Here only one guide reported the industry with a perfect score (5), while 27 respondents chose a four to best represent the industry's environmental practices. Twenty seven respondents (63%) rated their own operation as the equivalent rating they gave to the industry, while most of the remainder felt their current operation was operating at a higher level than the comprehensive industry. Finally when asked about sea kayaking in general (inclusive of recreational paddlers) respondents impression shifted towards the lower end of the scale. Only nine respondents offered a positive mark of 4 or 5 on the scale. The majority of responses indicated a three, with the remaining ten responses indicating a 2 or lower. This showed the respondents envision themselves and their operations as applying better environmental practices when

compared to recreational sea kayakers. Only four respondents chose the same level of response for all three surveyed categories.

Table 20. Respondent opinion on the state of various categories within the sea kayak industry. N=43.

Respondent assessment of...	Response	Frequency	Percent
Commercial sea kayak industry (guided trips)	1	0	0.0
	2	4	9.3
	3	11	25.6
	4	27	62.8
	5	1	2.3
Sea kayak industry as a whole (recreational users included)	1	2	4.7
	2	8	18.6
	3	24	55.8
	4	8	18.6
	5	1	2.3
Your individual company/ organization	1	1	2.3
	2	2	4.7
	3	9	20.9
	4	20	46.5
	5	11	25.6

Observation of other Guide Behaviour

Lastly guides were asked to comment on their own observations of other guides operating in their industry. Twenty-seven guides (63%) reported having personally witnessed other sea kayak guides or operators acting in ways that negatively impact the environment. Wildlife viewing posed the highest number of comments concerning poor guide practices. Twelve of the 27 guides who reported observing poor practices reported having seen guides mismanaging their groups during wildlife interactions. The primary concern noted by respondents was the close proximity of client groups to whales. Numerous guides regularly observed other operations and/or guides encroaching on the mammals' space well within the 100m guideline. Additional concerns were noted about the handling of intertidal species both on and off the water.

Fires were another theme that arose from guide reported infractions. Fires were reported as being large, poorly managed, and often not cleaned in the morning. Six of the 27 guides reported this as a concern in

their area. Along with fires, waste and food management were the third theme that arose from this question. Seven guides reported observing the regular mismanagement of waste specifically from commercially led operators. Guides were observed disposing of organic waste into both the aquatic and terrestrial environments, as well as leaving excessive waste behind at camp and break sites. Furthermore the improper storage of food products and attractants around camp locations was also mentioned. This included poor use of bear deterrent strategies (i.e. bear hangs, and storage) and untidy camp locations, both of which potentially attract wildlife into the area.

Finally the construction of permanent or semi-permanent campsite structures was one of the issues commonly reported by guides (5 of the 27). Included in their comments were concerns about the construction of camp structures and beach furniture (including nailing into trees), the clearing of additional forest space for camp structure expansions, and the clearance of vegetation for semi-permanent tent sites.

Discussion

The following section outlines the cumulative results of this study. It presents the key findings from both the observational and survey portions of the study as well as incorporates supporting comments from interviews conducted during the study. This section will highlight some of the notable data collected on guide behaviours and practices and some of the differences between the data collection methods.

Guide Practices

Guides in this research shared a personal connection to the environment. As one interviewee stated, “this industry attracts like-minded individuals who share a passion for the outdoors, and the desire to protect its integrity”. The observation data appeared to support this statement. Unfortunately interview and survey responses provided contradictory information where guides reported fellow professionals who are not following best practices. Regardless of this point, whether they are in it for the short term job, or a lifelong career, all guides who participated in this study expressed an understanding of the connection between the condition of the coastal environment and the jobs they have chosen. As such all that were observed, interviewed, and surveyed felt that they themselves were good examples of how the marine environment needs to be treated.

One aspect of their confidence came from their level of education and environmental awareness. Training and knowledge came from a variety of sources, such as universities and formal educating bodies, employers and fellow guides, as well as professional guide training programs. Additionally, a significant and undeniable portion came from personal interest reading and associated research. Regardless of which source, the lessons learned have become fundamentals on which the guides base a number of decisions and in turn their actions and practices.

It was clear, from both observational and survey components that the large majority of guides displayed a high level of confidence in the practices applied in the field. Or, in other words, it appears that they believe what they are doing is in the best interest of, or at the very least non-harmful to the ecosystem in which they operate. Through this it can be understood that no guides were intentionally harming, or acting in ways that they felt would have negative consequences for the sensitive environment. Where a discrepancy exists is not in the intentions of the guides, but that they practices they are familiar with may not be the prescribed best practices.

Through this study it became apparent that there may be a lapse in environmental education in some areas of the industry, or at least room for added education. Current knowledge levels may be adequate, but additional training may improve the transfer of theoretical knowledge, to physically applicable skill sets in the guiding world. If the information does not translate into modified actions, it is not being utilized for its intended purpose.

Many guides in all components of this study felt that training was an area that could see significant improvement for guides. Although some guides praised their employers as being excellent role models and offering great in-house training, multiple guides expressed that not all operators were taking this responsibility upon themselves. When interviewed, a group of three guides all agreed that there was a serious inconsistency in this area, and standard training within a single operation was not always present. Another individual guide expressed through an interview, the desire for a specific environmental seal or certification for operations. This would be issued to the operation once its guides have met a certifiable standard of environmentally friendly guiding practices. This standard would be aside from the general business operations (office practices), and would pertain directly to in-field guide actions, camp practices, and overall environmental impact of the given trip. At the time of this study it was difficult to determine if operators played any form of role in the development of their guides as good ambassadors for the environment.

From these comments, as well as the observed guide actions in the field, this study has shown that training and education is one area that the industry can make changes in order to further itself as an environmentally conscious industry. With some simple adjustments to operator and guide training protocols, it will be possible to ensure all guides are acting in a manner consistent with what best works for the given operation, and geographic area.

Wildlife practices

Wildlife practices are an area that significantly impacts the success of a commercial tour. Here a fine line exists between providing the experience expected by clients, and acting in the best interest of the environment. This study has shown that the guides observed and surveyed have practices and behaviours that generally respect the marine wildlife that they encounter. However, this does not mean that there is no room for improvement.

The manner in which intertidal life was treated by guides involved in this study varied greatly between individuals. Perhaps this illustrates the gaps in the knowledge base among guides as to which practices are best suited for animal and ecological welfare.

During the observation phase of the study, some guides were observed acting in ways that were not respectful of the intertidal species. Mishandling, and over handling of specimens were commonly noted among specific guides (repeat offenders). However, when questioned about the impact on the animals, these guides expressed the opinion that the animals were resilient and would remain unharmed from the process of observation and handling. This could be a result of missing education on marine biology, or training by higher bodies, or it could be a result of the spread of misinformation from guide to guide as to what behaviours are acceptable. Regardless, there is certainly place for improved practices among guides in the area of intertidal life handling.

This is not to say that good practices were not noted. In fact, the majority of guides observed provided excellent handling or non-handling of the delicate animals. Careful and limited handling of specifically selected species served as an educational platform for clients of the tour. By selecting individual animals for the collective group to see, impacts were concentrated to a single organism while avoiding impact on a much greater number of animals. Secondly the restriction of species was noticed in some observations and was reported in the guide survey. In this, the species were restricted to those that are more resilient to human handling; this is a practice that should be strongly encouraged around the industry. More fragile species and those susceptible to human impacts were included in a “look but don’t touch” policy. These common practices not only helped reduce the impacts on the marine life, but also helped to encourage respectful wildlife viewing and handling behaviour among the clients of the tours.

Finally, there were a small number of guides who chose to operate above and beyond the normal practices for minimizing impact on intertidal life. These guides carried “barrier” systems to minimize the contact between specimens and the observers, which further reduced the stress on the animals. Some examples observed were glass jars used for holding suspended animals such as jellies and nudibranchs. Plastic or glass dishware and cutting boards were also used. These structures served as a platform or container for holding some species (e.g. sea cucumber) while allowing them to remain partially submerged in water. However, the most simple and easiest form of barrier was a neoprene glove which was explained as protection from the oils on the human skin. The guides who applied these practices in the wilderness setting expressed an ideal compromise between providing interactive educational opportunities for clients, while maintaining concern for the integrity of the species and the ecosystem as a whole. If animals are to

be handled for clients, these practices exemplify what can be done to ensure that impact is reduced as much as possible while still providing the opportunities being sought by guests.

Marine mammals provide a great opportunity for guides to improve their practices. Observed guides showed the need for more clear and practical guidelines specifically for the activity of sea kayaking. Guides expressed a level of concern with the way guidelines have been created to date. Guidelines are logical, and applicable to the larger marine mammals (whales, sea lions, etc.) however, they are seemingly irrelevant to those mammals that are smaller. A common understanding, expressed through interviews, was that guidelines were established for these larger mammals (whales through the whale watching industry) and then broadly applied to all marine mammals and birds. Unfortunately animal behaviour of the broad mammal category differs greatly from species to species.

Seals were the mammal that encountered the highest number of infractions of the 100m guideline. Guides described these animals as comfortable around boaters, abundant, and nearly impossible to avoid close encounters with. Attempts were often made to give wide berth to known haul outs, but the geographical distribution of these mammals make it a possibility for them to be around every corner. Guides felt it was impractical and unsafe to paddle along coastal waters without encountering some of these mammals within the 100m guideline; to do so would force kayakers into open waters where conditions are not suitable for commercial trips. Secondly, guides feel as though their presence does not affect animal behaviour until well within the 100m distance. Efforts were often made to avoid impacting behaviour, but the parameters established at 100 meters were expressed as being overstated for these smaller mammals.

Survey data further confirms the variation in guiding practice around marine mammals. When given the option, the majority of guides stated they would encroach within 100m with clients providing they did not cause the animal to alter its natural behaviour. Despite not being in adherence with the defined protocols, this behaviour, in the view of the guides, is still accounting for the animal's welfare and is common practice among the sea kayak guides included in this study.

Aside from the now apparent issue surrounding smaller marine mammals, larger marine mammals fit a different category. Guide actions were extremely positive towards respecting guidelines when it came to larger mammals. Whale guidelines were verbally expressed and physically enforced by all guides who were observed as part of this study. At no time was there an opportunity which allowed for deviation from these guidelines on any of the tours the researcher participated in during this research. It is however, difficult to say from these observations if this was due to the animal's natural behaviour (speed and travel purposes), and less to do with guide control and instruction.

The survey respondents contradicted the observational findings, where guides reported commonly seeing commercially led kayak parties encroaching on these animals. This was one of the most frequently reported infractions reported by survey respondents about fellow guides and operators. Further observations are required to assess whether or not commercial or recreational kayak groups are travelling within the 100 meters when in the presence of large marine mammals. The limited whale encounters during this study, simply did not provide enough evidence to confirm good or bad practices with regards to the distance guidelines.

Site preferences

Sites used by commercial groups were generally not selected based on environmental factors. The coastal environment, and limited options for landing boats were the highest determining factors in the selection of sites for both landing kayaks and consequently for camping locations. Having said this, guides who were familiar with their geographic regions did often choose areas for launching and landing kayaks that were limited in sea life, and well suited for boat manoeuvring. Limited observations were noted of areas that were used despite the presence of abundant intertidal life. Fortunately the areas commonly selected, and those that were best suited for landing boats, small particulate substrates, also coincided with lower levels of intertidal life distribution. Only one beach throughout the duration of the observations had an active sea star population at the landing site. All other sites were largely barren landing zones with the exception of sporadic barnacle populations which depended on tidal conditions. From this it appears that the beaches selected by guides based on ease of access, and suitability for boat protection also coincides with the reduction of environmental impact on marine organisms. Survey data further supported these observations, although it does appear that the large limiting factor is availability of landing accessible beachfront regardless of substrate and marine life.

For tenting areas client comfort was the highest concern among guides. Where designated camping was not applicable, guides would place great amounts of effort in finding soft, flat and suitable locations for tent sites without concern for damage, or travel through the forest environment. In these situations, guides and clients were noticed to have a significant impact on the terrain and landscape from trail erosion and hardening. However, the majority of tours operating in BC were found to occur in areas that have developed camping locations, and frequently used sites. Provincial and National Parks have clearly outlined camping locations that are patrolled and enforced throughout the paddling season. Here guides have little influence on tent location, and are forced to strictly adhere to park mandated regulations for groups. In these situations guides used the designated camp areas, which seemingly coincided with

comfortable areas for clients. Both of the above situations were complemented by survey findings. Camping pads, forests, and fields were highly favoured by the guides from the survey, and appear to be the top choices for all guides, regardless of the differing situations.

Camp areas, such as the kitchen facilities, were another area that was noted to be relatively well managed by guides. Aside from the construction of base camp structures, sites used by guided groups were left in the same condition as when they were first found. Although guides utilized beach wood and found products to establish formal kitchen areas (counters, and serving platforms), all structures were taken down prior to departure. In regularly used areas, some of these materials were then stored for future use. This however, was another point that did not necessarily coincide with the survey data. Some guides reported observing other guiding parties constructing large amounts of camp furniture that was not dismantled upon departure. It is assumed, that these occurrences can be found in areas with base-camp style trips with operators who utilize one location for all trips. This type of structure was regularly found in the Vancouver Island North region, and was common among those trips operating in the Johnstone Strait areas. With regards to more mobile trips, and those operating in regions other than this, observations within this study did not support these statements. Further research could be conducted to determine the validity of these claims.

Finally, a small number of interviewed guides expressed a preference for camping on First Nations controlled land. The justification provided for this was to escape some of the regulations and restrictions enforced on park and Crown lands. For example, fires were more commonly permitted on Indian Reserves where fire bans existed in parks a short distance away. Other reasons for choosing Indian Reserves for camping, was the ability to reserve and control specific sites for the duration of a paddling season. This allowed for certain companies or guides to ensure camping locations, as well as provide a base camp structure that guides speculated would reduce the cumulative impacts over the duration of the season. The establishment of these base camp areas concentrated the impacts from companies, with high client numbers, over the duration of an entire season.

Camp practices

Camp practices have the biggest potential for leaving impacts from commercial tours. When at camp, a large group of people are concentrated in a relatively small geographical area with confined corridors for movement. This research has shown that despite the geographical restrictions overall guides are managing this potential for impact well.

On the whole, waste management was one of the most impressive parts of guided tours. The majority of observed guides operated using a three bag system. This system separates garbage, recyclables, and compostable materials to be packed out and disposed of at later times. At the conclusion of trips no waste was found left at campsites, and the garbage bag was very small. Two variations to removing all waste were observed. First, some combustible packaging was burned given certain conditions. Paper products were burned if there was already a fire occurring, and there was a desire to reduce the volume of waste in the kayaks. The second variation was with regards to organic waste. One guide chose to dispose of organic waste into the environment of the tour. Fruit waste and food scraps were disposed of into the forest, or marine environments with the explanation that they were biodegradable and good for the intertidal life. Along with this multiple guides disposed of seafood scraps into the ocean. Justification for this behaviour was that it was just being returned to the sea; all of these food products were in fact locally caught. Both variations to waste control were minimal and each was only exhibited by a single guide of the seventeen observed. The large majority of guides operated as was first mentioned, with proper sorting and full removal. This practice was further supported by the respondents from the survey, and interviews found many kayakers to be passionate about the recycling and composting initiatives at their operations.

Human waste was also very well managed. In the majority of areas visited during this study the issue of waste management was considered and well managed. Clear instructions were provided on almost all trips as to where, and how to use the facilities. As well the method of human waste management was well suited to each given area. Those areas that saw highly concentrated and regular visitation by kayak users had outhouse and pit toilet facilities installed to accommodate the human waste. More remote operations utilized smaller cat holes and fecal collection devices to handle the waste. Intertidal zones were encouraged as a washroom facility to be used when away from camp. Urine dispersal in the intertidal zone is the commonly encouraged behaviour and is generally preferred over forested areas; fecal matter has not yet been endorsed for this purpose. At the time of this research, ongoing studies on the topic of intertidal dispersal of human feces were underway, but had not yet produced conclusive results as to the level of impact it may have. As such, it would be recommended that guides do not encourage this behaviour until the studies have concluded and impacts are known. Regardless, the management methods used were considered the most appropriate for the areas observed, and are further supported by the survey respondents. The collection device mentioned about was a rare and unexpected site, and is not common practice among survey respondents, or interviewed guides.

One area where camp practices can be improved is through enhanced compliance with fire protocols. There seems to be a great variation of opinions about fire practices amongst guides. A large percentage of guides expressed the importance of campfires to an overnight kayaking trip (supported by both

observation and survey findings). As such multiple guides attempted to host fires on every night of the multiday kayak trips observed. The only tours where fires were not a nightly occurrence were those operating in areas that did not permit fires, or weather made them an impossibility. Clients were never or rarely, consulted as to the desire for campfires. Often fires were lit, and shortly abandoned by guests as they retired to their tents. Although guides in the survey agreed that fires are an integral part of the kayak experience, many provided alternate methods for creating a similar affect and ambiance. One interviewee suggested using these methods for the majority of nights, while having one real fire for the experience. This guide felt the limitation of fire events actually can enhance its value to the group.

As British Columbia often offers a wet environment, creating fires can be a challenge. Multiple guides were observed using fire practices that were not considered best practice. White gas and other petroleum products were used as accelerants on multiple occasions when fire starting proved difficult. It was the opinion of the clients on these occasions that a fire was not required, and in fact it was too wet to sit and enjoy. However, determined guides took on drastic measures to provide a campfire for clients. This behaviour was not found to be supported by any other guides encountered throughout the study.

Finally there were limited observations of the practices associated with low impact fires. Locations of fires were generally suitable (existing rings, or low beach), but the remaining practices for minimizing impacts were frequently ignored. Most commonly large pieces of wood remained partially burnt in fire rings, while ashes were rarely dispersed afterwards. Fuel was a limited resource on most trips, and as such was collected from various beaches and transported back to the camp location. With the limit to the available fuel it seemed impractical that fires were often stoked higher and bigger than was required for, or desired by the group. Upon completion (morning after) many fire pits were left with partially burnt wood, and large ash piles, as well as wood stacks adjacent to the fire pit. No efforts were made to redistribute these woodpiles along the beachfront in a seemingly natural way. Observations also noted on two occasions charcoal paintings were also created by guides on nearby rocks with poking sticks and left.

Not all guides were guilty of deviating from the protocols. One campfire was observed that followed the detailed low impact protocols to the letter. This particular guide and assistant guide, displayed perfect no trace fire each night, which resulted in no scaring of rocks, remaining ashes, or partially burnt wood upon completion. The following morning left no trace that the fire had occurred as all remnants had been removed with the tide. More examples like this should be present in the industry, however this was the only one observed as part of this study. Survey findings generally do not support the wide spread use of proper fire protocols. Although guides report using the basic measures, it is rare to find guides who reported the proper use of all techniques required for low impact fires.

Finally instructions to clients were scarce in a camp setting. When given, clients were well informed as to behaviour and travel practices that were well suited to the environment. However, this did not occur regularly on trips. Often clients were observed making unnecessary trails and causing erosion to areas simply because they were unaware of paths they should be using. This was similar for some hygiene practices. Activities such as where to brush teeth were not explained and as such occurred in random areas around the camp. Simple instructions or reminders upon the arrival at camp could help to reduce the unnecessary impacts of group travel to these areas. When asked about this, some of the interview guides reported they do give instructions, while others felt it was common knowledge, and they forget that it should be explained to guests.

Inconsistent Guide Behaviour

As can be expected guide actions varied greatly between individuals. However, what was not anticipated was the extent to which actions and behaviours of an individual guide varied throughout the duration of a single trip. Inconsistency in practices and behaviours were elements of tours that became evident through this study. Guides commonly exhibited strong rules and behaviours for a given practice at one time, and unfortunately were found to be lax, or in complete opposition to their first stance at a later stage in the trip; the observed trend was to go from a stronger practice (close to BMPs) to practices less reflective of low impact training. This was found to be true in many parameters of these organized trips, but was most notable with regards to wildlife viewing. A classic example noted on multiple tours, was regarding local harbour seal populations. At the onset of trips, instructions were given to proceed with caution, quietly, and with wide berth around these animals to reduce the impact of the visiting kayakers. However for whatever reason, later in trips closer encounters and less rigid guidelines for viewing and photographing these animals were common. Again, this was something that was not limited to a single observation, but was a phenomenon presented by multiple of the guides observed. Unfortunately, it was not possible to discover potential reasoning for this trend, or justifications for the altered practice throughout the duration of a given tour. Data from the guide survey further supports this finding, as rewording of questions commonly resulted in a change in response to indicate more relaxed practices.

Observation/Survey Connection

Observations made up the main component and focus of this study. The intent of the survey was to supplement the observations, by incorporating input from a larger number of participants. However, it

was also important to see if the survey responses related to the actual observations that were made in the field. In many aspects of the researched behaviours, there were differences noted between the results from data collected through observation, and those collected through the survey.

In this study some differences were found in nearly every category of observation. Some examples were between self-report and observed wildlife practices. Survey respondents reported practices that are much more in line with the technical guidelines than was observed in the field. This pertained to both intertidal and mammal interactions. Similarly, guides also seemed to over-report their adherence to fire and camp management strategies. Where the roles reversed was with the reporting of other guides. Here, survey respondents highlighted issues in the guiding community that were not found during the observation phase of this study. Regular reports of specific wildlife infractions and camp management issues were reported about fellow guides and operators in the industry; evidence of which was not supported by observational findings.

Commonly found in self-reporting research, respondents report behaviours with a bias towards the socially accepted or desired answer (Adams et al., 1999). Therefore in this study, respondents may have responded to survey questions with a more environmentally friendly report, compared to their actual behaviour in the field. Without observation of the survey sample it is unclear to what extent this misrepresentation may have occurred.

Additionally limitations existed when comparing observed guide behaviours to the results found through the guide survey. The sample used for field observations was independent of that used for the survey distribution (although some cross over may have occurred). Therefore, a degree of caution needs to be used when comparing the observed guide behaviours directly to the self-report behaviour found through the survey. Both of these individual samples may not have been representative of the overall population of sea kayak guides in British Columbia, nor were they intended to be due to the inability to secure a sampling frame. Secondly, it was unknown if the observed guides responded to the survey. Although the self-administered surveys may have been completed, without conclusive identification of which surveys were completed by the individually observed guides, it is not possible to compare these results directly. Therefore the interpretation of the differences between these two groups was done with these limitations in mind.

Conclusions

This study has shown the relative state of the commercial sea kayak industry with relation to its guides' behaviours in the field while guiding clients. Through this study a better understanding of the current status of environmental practices has been gained. It has shown through observation many of the common practices currently being applied in the industry, as well as where many deviations exist from the suggested practices designed for low impact travel. Similarly, it has helped to understand that there is a desire for further learning from the guides themselves. Furthermore guides strongly support the development and inclusion of environmental practices within their employer and professional training programs. As an industry that is reliant on the environment, all guides reported the importance of its protection, and a willingness to adapt their strategies to best suit its protection.

The success of this study came from the individual elements that comprised the study. Each individual element helped to create the comprehensive understanding of current environmental practices in the commercial sea kayak industry in British Columbia that was the result. The first successful element of the study was the consolidation of environmental research and development of observable criteria for field observations. Secondly, this research was able to apply these criteria, in the field for the first known documentation of field observations of guide behaviour in British Columbia. Thirdly this research interpreted the behaviours of the observed guides, as they related to existing industry best practices. And finally, this study was able to contrast these field observations with the self-report data collected through the survey administered. The successful execution of each of these elements combined to create the first documented, comprehensive study of sea kayak professionals' practices in environmental stewardship.

This process led to the successful achievement of the objectives outlined at the onset of the study. The research was able to successfully identify the best management practices for the industry. Furthermore the study was able to observe the practices of guides in the field in order to assess the extent to which these practices were being applied. And most importantly, the research was able to identify key areas where improvements can be made in order to further the use of these practices among the guiding community.

One great reason for the success of this study was its unique approach to the study topic. By adopting a blind participant observer approach, this research gained strength through its ability to make sound observations without influencing the behaviors of the guides being researched. Coupled to this, the survey data helped to get a glimpse at a larger number of guide actions, but also to gather some justifications for actions used, and decisions made while guiding. This was further supported by the

interviews and discussions had between the researcher and the many players in the industry. By utilizing this multi-method approach to the research, in conjunction with the successful steps to the research process outlined above, the study has allowed for a broad yet detailed understanding of the current state of environmental practices in the commercial sea kayak industry in British Columbia.

Suggested Actions

Although the industry is doing well in its desire to reduce and minimize impacts from its activity and visitors, there is always room for improvements. In order to continue a strong leadership role in environmental protection, the following three recommendations could be taken by the industry to ensure its longevity, and the quality of the environment in which it operates. Each of these will be further described below:

- Encourage of the implementation of annual best practices training at the operational or business level.
- Encourage the further inclusion of environmental practices into guide training and certification programs.
- Increase research into the development and dissemination of best practices for wildlife practices in the given environments

Environmental practices often need to be tailored to the specific geographical region in which they are to be implemented. In this sense, it becomes important for operations (businesses) to create their own localized practices that aim to reduce visitor impact on their areas. Once created, these practices should be documented, and incorporated into staff training for each and every one of their employees. Although some guides have countless years of experience guiding tours, it does not necessarily mean that their knowledge of environmental conditions is directly transferable, or outdated for the given region. Strong encouragement of operator led environmental training and business endorsed practices could go a long way in ensuring that regional best practices are being applied in the field by their guiding teams.

Secondly, a stronger representation of environmental practices could be included in organized guide training and evaluation by those organizations certifying guides in BC and Canada. Despite not being mandatory, professional certification is sought out by both guides as well as employers in the industry. As such a key factor in guide employment, this is a natural place to incorporate some more up to date training for guides on wilderness behaviours and low impact practices best suited for kayak guiding. Although the main aspect of these programs should remain on the development of safety, boat handling,

and decision making skills, there is a good opportunity to include low impact education into this captive audience, and the upcoming industry leaders. Additionally, training and information could be included in all professional development activities that are hosted or required by these professional organizations.

Finally, it is important to encourage further research into the differing aspects of sea kayak industry and its related fields. As time goes on, research often highlights inaccuracies, or new knowledge that holds a more realistic value for the present situations. With the support of research into environmental impacts of recreational and commercial kayaking, as well as their associated potential and actual impacts, better and more implementable strategies can be developed. By staying involved in the research aspect, it encourages the development of strategies that are possible and useable by guides in the field, as opposed to solutions that are unrealistic for guides operating in wilderness settings.

Further Research

This research serves as a starting point for further studies. It is important to continue evaluating and improving the knowledge behind the industry, in order to best ensure its integrity and existence into the future. With a relatively small sample size for observations, there is room for expanding this study to a broader range of kayak guides in the BC industry. In addition there would be a benefit from examining the training process and transference of knowledge and skill from training through to the active guiding stages. This would help to identify if gaps exist, or if the level of knowledge being taught and evaluated, is being reflected in the actions of guides in the field.

Furthermore additional research into the impacts and effects of sea kayaking on the environment is a key area that requires long-term study parameters and commitment. Although some studies presently exist, a greater diversity of specific variables being examined could be obtained through newer studies, and in areas known to concentrate commercial kayak users.

Finally there is an opportunity to explore the differences between commercial and recreational kayak users. As a professional industry, it stands to reason that a level of knowledge and awareness could and perhaps should exceed that of the average recreational paddler. In this sense, a comparative study identifying knowledge levels and practices with regards to environmental behaviours could benefit both parties equally, and identify further gaps that need to be addressed.

Literature Cited

- Adams, A. S., Soumerai, S. B., Lomas, J., & Ross-Degnan, D. (1999). Evidence of self-report bias in assessing adherence to guidelines. *International Journal for Quality in Health Care*, 11(3), 187-192.
- Armstrong, E. K., & Weiler, B. (2002). Getting the message across: An analysis of messages delivered by tour operators in protected areas. *Journal of Ecotourism*, 1(2), 104-121.
- Arnould & Price. (1993). River magic: extraordinary experience and the extended service encounter. *Journal of Consumer Research*, 20, 24-44.
- Association of Canadian Sea Kayak Guides. (2011). *Association of Canadian sea kayak guides*. Retrieved from <http://www.acskg.ca/>
- Beeton, S. (2005). The case study in tourism research: A multi-method case study approach. In: B.W. Ritchie, P. Burns & C. Palmer (Eds.), *Tourism Research Methods: Integrating Theory with Practice* (pp. 37-47). Wallingford, UK: CABI Publishing
- Byrnes, T., & Warnken, J. (2003). Establishing best-practice environmental management: Lessons from the Australian tour-boat industry. In R. Buckley, C. Pickering & D. Weaver (Eds.), *Nature-based tourism, environment and land management* Oxon, UK: CABI Publishing.
- Cole, David. (2004). Monitoring and management of recreation in protected areas: The contributions and limitations of science. *Aldo Leopold Wilderness Research Institute*.
- Dawson, Jackie (2003). Environmental Values of Consumptive and Nonconsumptive Marine Tourists in the South Island of New Zealand. New Zealand: University of Otago.
- Eagles, McCool, Haynes. (2002). Sustainable Tourism in Protected Areas: Guidelines for planning and management. The World Conservation Unit
- Grand Canyon River Outfitters Association. (n.d.). *National park service: Legal mandates*. Retrieved from <http://www.gcroa.org/Pages/nps.htm>
- Gurung, G., Simmons, D., & Devlin, P. (1996). The evolving role of tourist guides: The Nepali experience. In R. Butler & T. Hinch (Eds.), *Tourism and Indigenous Peoples* (pp. 107-128). UK: International Thomson Business.
- Harper, Nevin. (2010, March). Outward Bound Canada. Interview by Greg Simmonds [Personal Interview].
- Highman and Luck, (2008). *Marine Wildlife and Tourism Management*. Cambridge, MA: CAB International.
- Hill & Gale. (Ed.).(2009). *Ecotourism and Environmental Sustainability: Principles and practice*. Burlington, MA: Ashgate Publishing Ltd.
- Hu, W. (2007). Tour guides and sustainable development: The case of Hainan, China. *PhD thesis*, University of Waterloo.
- Littlefair, C. J. (2003). The effectiveness of interpretation in reducing the impacts of visitors in national parks. *PhD thesis*, Griffith University.
- Leung, Y., & Marion, J. L. (2000). Recreation impacts and management in wilderness: A state-of-knowledge review. *USDA Forest Service Proceedings RMRS-P-15*, 5,

- Manning, R. (1999). *Studies in outdoor recreation: Search and research for satisfaction*. Corvallis: Oregon State University Press.
- Manning, Ted. (2010). Interview by Greg Simmonds [Personal Interview].
- McGivney, A. (2003). *Leave no trace: A guide to the new wilderness etiquette*. (2nd ed.). Seattle, WA: The Mountaineers Books.
- McNeil, Liam. (2011). Interview by Greg Simmonds [Personal Interview].
- Ministry of Environment. (2006). Wildlife guidelines for backcountry tourism/commercial recreation in British Columbia. Victoria, BC.
- Monz, Christopher A. (1998). Monitoring Recreation Resource Impacts in Two Coastal Areas of Western North America: an Initial Assessment. USDA Forest Service Proceedings
- Monz et al. (2010) National Outdoor Leadership School (2010). Interview by Greg Simmonds [Personal Interview].
- Newsome, Moore, Dowling. (2002). Natural area tourism: ecology, impacts, and management. North York, ON: Channel View Publications.
- Orams, M.B. (1999). *Marine Tourism, Development, Impacts and Management*. New York: Routledge Press.
- Patton, M.Q. (1986). *Utilization-focused evaluation*. Beverly Hills, CA: Sage Publications.
- Petch, B. (2010, November). Interview by Greg Simmonds [Personal Interview].
- Randall, C., & Rollins, R. B. (2009). Visitor perceptions of the role of guides in natural areas. *Journal of Sustainable Tourism*, 17(3), 357-374.
- Sea kayak Guides Alliance of BC. (2011). *Sea kayak guides alliance of BC*. Retrieved from <http://skgabc.com/>
- Sherman, John. (1995). *Hueco tanks, hueco tanks*. Glove Pequot.
- Simmonds, Greg. (2009). Environmental conflict: An examination of the commercial sea kayak industry. Unpublished work.
- Singh, Slotkin, Alexander, Vamosi. (2007). Attitude towards ecotourism and environmental advocacy: profiling the dimensions of sustainability. *Journal of Vacation marketing*, 13, 119.
- Sirakaya. (1997). Attitudinal compliance with ecotourism guidelines. *Annals of Tourism Research*, 24(4), 919-950.
- Swarbrooke, Beard, Leckie, Pomfret,. (Ed.). (2003). *Adventure tourism: the new frontier*. Burlington, MA: Elsevier Science.
- Taylor, J.Y. (1997). Leave only footprints? How backcountry campsite use affects forest structure. *Yellowstone Science*,
- Taylor, Scot (2009, June). Interview by Greg Simmonds [Personal Interview].
- Tourism Activities and Motivations Survey, Initials. (2008). Outdoor activities overview report. *Canadian Travel Market*,

- Tourism BC. (2007). British Columbia's Sea Kayaking Sector (2005).
- Twardock, P., & Monz, C. (2000). Recreational kayak visitor use, distribution, and financial value of beaches in western Prince William Sound, Alaska between 1987 and 1998. *USDA Forest Service Proceedings RMRS-P-15*, 4,
- Twardock, P., Monz, C., Smith, M., & Colt, S. (2010). Long-term changes in resource conditions on backcountry campsites in Prince William Sound, Alaska, USA. *Northwest Science*, 84(3),
- Walle, A. (1997). Quantitative versus qualitative tourism research. *Annals of Tourism Research*, 24(3), 524-536.
- Weaver, D.B. (ed.). (2001). *The Encyclopedia of Ecotourism*, New York: CABI Publishing.
- Weiler, B., & Kim, A. (2011). Tour guides as agents of sustainability: Rhetoric, reality, and implications for research. *Tourism Recreation Research*, 36(2), 113-125.
- Wilson & Hamilton. (2004). A Strategy for managing backcountry recreation in relation to wildlife. Victoria, BC: BC Ministry of Environment.
- Zhang, Liu & Li. (2009). Ecotourism and nature-reserve sustainability in environmentally fragile poor areas: the case of the Ordos Relict Gull Reserve in China. *Sustainability: Science, Practice, & Policy*. Fall/Winter Volume 4.

Appendix A – Glossary of Terms

Commercial sea kayak industry: The commercial sea kayak industry refers to any sea kayaking activity that incorporates the exchange of money (i.e. rentals, tours, etc.). This study focuses on the guided tour portion of this sector.

Professional organization: A professional organization is an alliance, association, or organization that offers a professional certification indicating that guides have met a standard for skill and knowledge, and allow the guide to operate with the organization's endorsement. The two main organizations in this study area were the Sea Kayak Guides Alliance of British Columbia (SKGABC) and the Association of Canadian Sea Kayak Guides (ACSKG).

Wildlife: Wildlife refers to all living animals encountered on kayak trips. This includes animals in, on and above the sea, as well as those found on shorelines and surrounding terrestrial habitats. For the purpose of this study, when referencing human interactions, sea weeds are included in this category.

Best Management Practice: Best Management Practices (BMPs) are specific practices and strategies designed to reduce overall impact for a given activity, region, or species or environment protection. BMPs are not always transferrable to, or realistic for guided activities.

Land Zones: This refers to the level of land ownership and classification. This includes, but is not limited to, zones such as national and provincial parks, Crown (public) land, Indian Reserve, etc.

Appendix B - Guide Survey

2011 Sea Kayak Guide Survey

Environmental Practices



My name is Greg Simmonds. I am a graduate student studying environmental science at Thompson Rivers University, as well as an active sea kayak guide in coastal British Columbia.

As you know, the sea kayak industry in BC is based on the pristine environment that our coast has to offer. Our clients come to experience the wildlife, unique history, and aesthetic beauty that can only be found here. As guides we not only provide safe travel and access, but also are seen as ambassadors of the area and provide environmental knowledge to our clients through our lessons and actions while guiding. This survey is part of a study designed to gain a better understanding of current guides' environmental knowledge and actions while guiding clients in the field.

Your participation in this survey is voluntary and it will take about fifteen minutes. All information collected during this survey will remain confidential and anonymous. If you wish to cease participation you may do so at anytime. By submitting this survey you are consenting to participate in this study. Information will be electronically stored for seven years post study, before being permanently erased. Only the primary researcher (Greg Simmonds) and his supervisor (Dr. Rob Hood) will have access to the data. If you have any questions about the survey or would like more information on the greater study, please contact Greg Simmonds at (250) 819-9833 or by email at greg-simmonds@mytru.ca.

1) Do you actively guide sea kayak trips with paying clients in British Columbia?

- Yes
 No

2) How many years have you guided in Canada? (include the current season)

3) Which area best represents your primary guiding region?

- Haida Gwaii
 Northern British Columbia
 Sunshine Coast
 Vancouver/Lower Mainland
 Southern Vancouver Island
 Western Vancouver Island
 Northern Vancouver Island
 Other (please specify)

If you selected other, please specify.

4) If known, please indicate the primary land zoning on which you regularly operate

- BC Park
 National Park
 Private Land
 Crown Land (public)
 Indian Reserve
 Marine Conservation Areas
 I don't know

5) Are you a member of any of the following organizations? (please check all that apply)

- Sea Kayak Guides Alliance of BC
- Association of Canadian Sea Kayak Guides
- Paddle Canada
- Other (please specify)

If you selected other, please specify.

6) Please indicate your current level of certification (choose all that apply)

- SKGABC - Level 1
- SKGABC - Assistant Overnight
- SKGABC - Level 2
- SKGABC - Level 3
- SKGABC - Class 4 Water Endorsement
- ACSKG - Assistant Guide
- ACSKG - Full Guide
- ACSKG - Class 3 Full Guide

7) Do you use the same break sites or camp locations on nearly every trip?

- Yes
- No

8) Please rank the following, from 1 - 5, in order of importance when choosing a camp location (1 being the most important factor).

Proximity to water _____

Site aesthetics _____

Minimizing environmental impact _____

Using established sites _____

Site designated by your employer _____

Client comfort _____

Elemental protection (shelter from the weather) _____

9) Please rank the following, from 1 – 5, in order of importance when selecting areas for launching/landing kayaks (1 being the most important factor).

Ease of access/ approach _____

Safety _____

Beach substrate (rock shelf, sand, boulder, etc.) _____

Minimal environmental impacts _____

Protection from the elements (wind, wave, etc.) _____

Protection for boats (minimal damage to boats) _____

10) Please rank the following ground covers, from 1 – 5, in order of your preference for setting up tents.

Sand/ gravel _____

Cobble stone (small boulders) _____

Sea grasses (grasses growing at or below the highest tide line) _____

Forest floor _____

Grassy field _____

Established camping pad _____

Rocky Shelf _____

11) When traveling with a large group (8 or more people), how does the size of your group impact your site selection? (Assume the options are available)

	Never	Seldom	Often	Always
I keep more separated from popular public sites	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I choose more hardened sites (previously impacted areas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find larger beaches to allow the group to spread out more	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use the same spaces and condense the group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use group designated sites (picnic areas, designated camp areas, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12) What heat source do you primarily use for cooking? (please explain your choice in the space below)

- Camp fire
- Propane Stove
- Gas Stove

Additional comments

13) When camp is established I...

	Never	Seldom	Often	Always
Encourage clients to keep camp noise to a minimum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instruct clients to use existing trails when exploring the forest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Get clients to help with food preparation and clean up	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Establish a group area for client washing and hygiene	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Try to keep clients on the beachfront instead of in the forest	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

14) What is your usual method of food control at night?

- Bear hang
- Kayak storage
- No control
- Bear boxes or barrels
- Bury food in a log pile
- Existing bear control system (bear box or permanent hangs)
- Other (please specify)

If you selected other, please specify

15) When setting up tarp shelters how often do you...

	Never	Seldom	Often	Always
Tie cord directly around tree trunks and branches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incorporate kayak paddles to gain height	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use extendable tarp poles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use a protective knot, or buffer between rope and tree trunk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16) Do you feel campfires are an important part of an overnight kayaking experience?

- Yes
 No

17) When on a trip, how often do you...

	Never	Seldom	Often	Always
Carry and use a fire pan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Build a fire mound when above the tide line	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construct a rock ring to contain fires	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Build fires below the high tide line	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use only driftwood with a diameter smaller than your wrist as fuel	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ensure that all wood is burnt to a fine ash	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Redistribute ash over the intertidal zone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18) Do you have alternatives to campfires that you use on trips? Please explain in the space below.

19) Which best describes your waste management while on trip? (please select one and explain your choice below)

- Pack out all waste
- Burn combustibles, pack out the rest
- Burn combustibles, spread organics, pack out the rest
- Burn everything

Additional comments

20) While guiding, how often do you remove third party garbage from your trip area?

- Every trip
- Occasionally
- This is not necessary there is very little garbage
- There is too much garbage for this to be of benefit
- Never

21) How frequently do you use the following methods of human waste management while on trip?

	Never	Seldom	Often	Always
Established outhouses or pit toilets (when available)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Group latrines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cat holes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Intertidal zone (low beach area)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portable toilets (boom box, sealing bag to pack out)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biodegradable bags for high current disposal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22) What do you do with bathroom tissue and female hygiene products?(please select one)

- In ground burial
- Individuals burn their own
- Bag and burn the group's collectively
- Bag and pack out
- Leave it up to the client

23) When educating clients on wilderness bathroom protocols how often do you...

	Never	Seldom	Often	Always
Have a group discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrate the techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Give instructions prior to trip departure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Give no instructions to clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24) When looking at intertidal life I...

	Never	Seldom	Often	Always
Encourage clients to pick up, touch and hold intertidal life as they please	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Select individual animals for the group to look at and touch collectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Encourage clients to look at, but not touch the animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Restrict species handled to those that are abundant and less fragile (i.e. purple stars)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25) During peak breeding/nesting seasons I...

	Never	Seldom	Often	Always
Avoid areas used for breeding, nesting, and haul outs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increase my distance from shore when approaching blind corners and points of restricted visibility	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Move to new beaches if the selected one is occupied by wildlife	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26) When observing marine mammals at haul outs...

	Never	Seldom	Often	Always
I keep the group greater than 100m from the animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I ensure the group is far enough away to not disturb the natural behaviour of the animals, but am within 100m	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take the group as close as they wish for pictures and observation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I make sure that boats are never pointed directly at the animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use myself as a boundary to restrict clients from approaching the animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Instruct clients to be quiet in order to reduce impact on the wildlife	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27) When clients are off the water at rest or camp locations with free time...

	Never	Seldom	Often	Always
Beach combing and exploration are encouraged	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A look but do not touch policy is encouraged among clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clients are instructed to watch their step in order to avoid crushing mollusks and other animals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clients are educated about local animal populations and habits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Clients are instructed to not approach mammals, birds, or other animals found on shore	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A guide led exploratory walk is arranged as a group	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28) Have you noticed a change in the condition of the environment in your working area? If so, please provide some examples of the changes you have noticed.

29) When guiding, do you see yourself as an ambassador for the environment? Why/why not?

- Yes
- No

Additional comments

30) As a guide...

	Strongly disagree	Disagree	Agree	Strongly agree
I am a role model for environmental stewardship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I take every opportunity to educate clients on how to minimize impact on the environment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I demonstrate good, environmentally sound practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I continually work to improve my low impact techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31) Does your operation have environmental practices that guides are required/asked to follow?

- Yes, and I follow them
- Yes, but I do not follow all of them
- Not that I'm aware of
- None exist

32) Have you received any formal training on environmental practices/ protocols for low impact sea kayaking from the following sources?(select all that apply)

- Sea Kayak Associations/ Alliances?
- Universities/Colleges, or other educational institutes
- Current employer
- Previous employers
- I have had no training
- Leave No Trace program
- Other (please specify below)

Additional comments

33) Please indicate your feelings towards the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
I believe environmental protection is important for my job	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I act in the best interest of the environment when guiding clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I encourage guides and operators to learn about minimizing impacts while sea kayaking and camping	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I feel that employers should incorporate environmental protocols into all staff training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that environmental practices should be incorporated into certified guide training and testing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

34) My environmental practices come largely from...

- Formal training
- Observing other guides early in my career
- Personal learning (books and research)
- Assumptions and feelings (instinct and logic)
- Client pressures

35) Are you aware of the environmental practices found on the sea kayak association websites?

- Yes
- No

36) How would you rate the following on a scale of 1 - 5 for environmental stewardship (5 being the most environmentally friendly)

	1	2	3	4	5
Your company/ organization	<input type="radio"/>				
Commercial sea kayak industry (guided trips only)	<input type="radio"/>				
Sea kayaking industry as a whole (recreational users included)	<input type="radio"/>				

