Management of Coastal Hazardous Sites: A case study of Reynisfjara Beach, Iceland

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Management of Coastal Hazardous Sites: Stakeholders: A Case Study of Reynisfjara Beach, Iceland

45 ECTS thesis submitted in partial fulfilment of a Master of Resource Management degree in Coastal and Marine Management at the University Centre of the Westfjords, Suðurgata 12, 400 Ísafjörður, Iceland

Degree accredited by the University of Akureyri, Faculty of Business and Science, Borgir, 600 Akureyri, Iceland

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Printing: Háskólaprent, Reykjavík, May 2017


**Declaration**

I hereby confirm that I am the sole author of this thesis and it is a product of my own academic research.

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Anika Truter
Abstract

The rapid growth of the tourism industry in many parts of the world has led to increasingly complex questions regarding ways to ensure effective management that leaves tourists satisfied and safe, and at the same time leaves host communities with economic and social benefits. In Iceland, inbound tourism increased by almost 73% from 2010-2016, and nature-based tourism continues to be a major draw. One popular beach, Reynisfjara, has been the site of three deaths since 2007 and numerous close calls as visitors are caught by surprise by dangerous sneaker waves and dragged offshore. The projected continued increase in inbound tourism has prompted the multiple stakeholders involved in the management of the beach to search for more effective management tools. This thesis aims to document current safety and site use issues at Reynisfjara Beach, to explore the most effective communication management tools to keep tourists safe, and to recommend a decision-making governance structure that involves local stakeholders. First, I conducted semi-structured interviews with key management stakeholders within Iceland to document stakeholders’ perceptions of safety at Reynisfjara Beach and to understand how current use of the site affects supportive industries/organizations. Second, using results from a literature analysis of hazardous sites around the world and the semi-structured interviews, I conducted a guiding principles framework analysis to make recommendations for potential future management options and decision-making arrangements at the beach. Recommendations for management tools include the presence of a ranger and increased visibility of warning signs. Highlights from the guiding principles framework analysis show that the lack of decision-making structure can hinder the efficacy of any management tool implementation. A stakeholder group called “Friends of Reynisfjara” (Vinir Reynisfjörur) is suggested and specific organization flow and funding scenarios are discussed. For tourism at Reynisfjara to be considered sustainable, a good management structure that incorporates all stakeholders is needed alongside the implementation of good management tools that protect the natural site and the visitors.
This thesis is dedicated to the families of those who have lost their lives at Reynisfjara Beach. Through this research I hope to assist in sparing other families such grief.
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List of Icelandic Terms

Ferðamálastofa – The Icelandic Tourism Board

Kötlusetur – Vik Tourism

Slysavarnafélægð Landsbjörg – Icelandic Association for Search and Rescue (ICE-SAR)

Umhverfisstofnun – The Environmental Agency of Iceland

Vegagerðin – Icelandic Road and Coastal Administration

Vinir Reynisfjöru – Friends of Reynisfjara
Acknowledgements

Thank you to my advisors Jamie Alley and Catherine Chambers for their attentive help throughout this thesis project. They both experienced life altering processes during this thesis and still managed to reply to every email and message I sent. I would also like to thank all the informants who were consulted for this project as well as the countless individuals who let me pick their brain about Reynisfjara. I would like to thank my mom for the emotional support throughout and Sabrina and Nia for the myriad of pep talks.
Executive Summary for Decision Makers

Management of Coastal Hazardous Sites:
A Case Study of Reynisfjara Beach, Iceland

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Aims

1. To describe how the current use of Reynisfjara affects various local stakeholders associated with the site.

2. To explore the range of visitor management tools available to deal with human safety and impacts on coastal site integrity, and to determine the most applicable and preferred option at Reynisfjara according to various local stakeholders.

3. To recommend a management structure for a decision-making process between the various local stakeholders.

Methods

- Literature review on similar sites to derive best practices at hazardous coastal sites

- 10 semi-structured interviews with relevant stakeholders in the host community

- Analysis of the results and comparison with the guiding principles framework (Visitor Safety in the Countryside Group, 2003)
Major Findings

Seven main themes emerged during the course of the interviews:

Management Recommendations

For Direct Stakeholders:

1. Post a ranger on site during peak hours
2. Create a website (or modify SafeTravel website) to warn users of dangers before arrival at site
3. Encourage tourist contact points to provide warnings about Reynisfjara
4. Address road and parking lot issues

For Indirect Stakeholders:

1. Address issues of landownership in management of tourism sites
2. Increase tourism site protection fund through tour operator contribution
3. Incentivize Vakinn
4. Turn Reynisfjara into a protected site
For examples from other destinations, see:

Surf Live Saving – Australia (sls.com.au)


Hawaii Beach Safety – USA (http://www.hawaiibeachsafety.com/)

Management Structure Recommendation

Non-Profit Stewardship Council – Vinir Reynisfjöru “Friends of Reynisfjara”

Vinir Reynisfjöru would be responsible for fundraising and deciding on management initiatives for the site. The development of this group would eliminate the stigma surrounding the collection of fees for private gain. As seen in figure 1 below it is proposed that the council would be comprised of three groups, the Land Owner Committee (Landeigendanefnd), the Tourism Committee (Ferðamálanefnd), and the Protection, Safety, and Environmental Committee (Viðbragðsnefnd). The group could begin by meeting twice a year and adjusting as necessary, however the smaller subcommittees may need to meet more frequently than this.
1. Introduction

1.1. Coastal tourism, the management of hazardous sites, host stakeholders, and sustainable tourism

1.1.1. Coastal Tourism

The international air travel industry is experiencing a large growth in business with more people travelling to foreign destinations each year (Becken, 2002). This increase is a result of more affordable, accessible flights due to competition within the industry as well as the shift in attitudes among the growing middle class (Gössling and Peeters, 2007). Additionally, the European Union to United States open skies agreement effective in 2008 has generally been seen as bringing lower prices and greater service options to the air travel market (Button, 2009). Travelers are now more likely to view travel as an indispensable part of life as opposed to previous generations that considered it to be a luxury (Gössling and Peeters, 2007). With this new access to international destinations travellers are often venturing to countries with landscapes that are entirely different from those in their countries of origin.

Just as humans have always been drawn to live in coastal areas the same is true of people who are able to travel to new coastal destinations (Gillis, 2012). The International Coastal and Marine Tourism Society (ICMTS) defines coastal tourism as, “recreational activities which involve travel away from one's place of residence which have as their host or focus the marine environment and/or the coastal zone (Orams, 1999).” Coastal tourism is comprised of three elements: coastal tourism development, coastal infrastructure supporting development and coastal tourism activities (Hall, 2001). This covers all elements of the coastal experience from accommodation and amenities to excursions and activities. According to the European Coastal Commission coastal tourism activities includes beach activities and any activity in which proximity to the coast is beneficial such as coastal walks and swimming (European Coastal Commission, 2014). Marine tourism is limited to those activities that are conducted on or in the water such as boating, angling, and SCUBA diving.
(European Coastal Commission, 2014). The region determines the popularity of the activity as some areas provide better conditions for certain activities. For example, water immersion activities such as surfing, swimming, and scuba diving/snorkeling are highly popular in warm water destinations such as Australia (Lonely Planet, n.d.) while non-immersive activities such as kayaking, whale watching, angling, and coastal hiking are more popular in colder destinations like Canada (Trip Advisor, n.d.).

1.1.2. The Management of Coastal Hazardous Sites

Coastal areas present a number of different safety hazards, and the varied knowledge backgrounds and cultural norms from diverse sets of tourist groups can make tourist safety difficult to standardize. Each coastal site in the world presents a specific set of hazards that is most familiar to those that inhabit the area. Appearances can be deceiving when it comes to coastal hazards as many of the most dangerous aspects of a site are difficult to identify from the shore. For example, rip currents are strong below the surface but are not immediately visible to a swimmer or kayaker (Parks Canada, 2013). A coastal site can also be life threatening for visitors who often have no conception of the extent of the hazards awaiting them at the site. For example, exposure to cold ocean water can compromise a person’s ability to breathe and can deplete body heat faster than air. The level of danger is increased when a person is exposed to multiple dangers at once, for example, strong waves and dangerous marine life. Conditions between countries and even certain sites within a region can be starkly different, therefore management to mitigate hazards at coastal tourism sites is often very site-specific.

1.2. Iceland and Reynisfjara Beach

One destination with a notable growth in tourism activities is the North Atlantic island of Iceland. Within the last five years, the Icelandic tourism industry has entered a boom phase and continues to grow. Tourism in Iceland has increased by almost 73% from 2010-2016 (Ferðamálástofa, 2016), which has led to a need for new management practices to deal with site crowding and ensure that tourists remain safe while using natural sites. Although the inbound tourism statistics from Keflavík airport are somewhat inaccurate due to non-compliance with international standards (Frenț, 2016), new techniques such as wilderness
mapping through geotagging provide insight into the increased concentration of tourists in certain areas (Tims, 2014). One key site that has experienced higher visitor concentrations and is central to the conversation of tourism safety in coastal areas in Iceland is Reynisfjara Beach, located on the south coast of Iceland (Figure 2). The site is 181km from Reykjavik, about a 2.5-hour drive. The site is integral to the business of many tour operators, as well as being a popular site for day trippers and individuals driving along highway 1 (the Ring Road).

Figure 2 Red oval indicating location of Reynisfjara Beach
The black sand beach features large basalt columns and two striking sea stacks named ‘Reynisdrangar.’ (Figure 3). The beach is highly popular and has become famous around the world after being featured in many popular musician’s music videos (Iceland Magazine, 2015). In the summertime puffins nest on the cliffs overlooking the beach making this an even more sought-after tourism destination. During the high season there are hundreds of visitors on the beach at any one time during the daylight hours (Robert, 2016). The beach also presents a number a safety hazards such as sneaker waves (see figure 4) that as of January 2017 has resulted in the death of three foreign tourists.
1.3. Research question, aims, and outline of the thesis

Due to the unique nature of a high-use yet cold-water beach, Reynisfjara has presented an interesting site for a visitor safety management case study. The sneaker waves and strong undertow combined with increasing number of visitors have spurred managers to update the safety infrastructure at the site. At the same time, the site lacks a comprehensive approach for planning visitor management as there is no coherent governance structure to bring the various planning stakeholders together. There are no similar sites to base the management of this beach on as most high-use beaches are warm water swimming beaches. This thesis examines the varied set of safety issues at the site and aims to provide insight into available management options for affiliated stakeholders in the host community.
This thesis is guided by the major research question:

**How can tourist safety issues at a hazardous coastal site be managed by affiliated host organizations?**

By using Reynisfjara as a case study this thesis will attempt to address the following aims:

1. To describe the current situation at Reynisfjara Beach according to local stakeholders and to understand how the current use of the site affects various local stakeholders associated with the site.
2. To explore the range of visitor management tools available to site managers to deal with human safety and impacts on coastal site integrity, and to determine the most applicable and preferred option at Reynisfjara according to various local stakeholders.
3. To recommend a management structure for a decision-making process between the various local stakeholders.

The thesis is organized as follows. There is an executive summary for decision-makers document at the start of the thesis so the results can be clearly and concisely available for decision-makers. Chapter 1 then introduces the topic in more detail. Chapter 2 reviews relevant literature on visitor safety management and discuss best practices used at other hazardous coastal sites in the world. Next, Chapter 3 describes the methodology applied for the thesis. Chapter 4 presents the results, Chapter 5 follows with a discussion of how the results relate back to the major aims of the thesis. Chapter 6 provides recommendations and finally, a conclusion is given in the last section of the thesis.
2. Background and Literature Review

With the development of the nature-based tourism industry, the need for more visitor safety management and conservation plans has emerged. Visitor safety management is an area that combines risk management, site user demographics and site specifications to create a plan for ensuring the safety of site users. The level of tourism development required at a site is very subjective and it can be hard to satisfy all visitors with one management plan (Sæþðorsdottir, 2010). Risk management is integral to the development of an appropriate visitor safety management plan as managers need to be aware of both the real and perceived risks of a site. Hawaii, Canada, and Australia all provide excellent examples of best practices in coastal visitor safety management. Due to the increasing number of tourists in Iceland, the country is experiencing a higher number of tourist safety incidents. This is especially notable at a site on Iceland’s south coast that has claimed multiple lives, Reynisfjara Beach. Iceland has increased safety infrastructure in the past years but there is room for improvement in the management of many hazardous coastal sites on the island.

Claude and Zaccour (2009) follow Butler (1980) when they note that tourist sites generally follow a pattern of growth, stagnation and decline over time. The decline of a tourist site can usually be attributed to negative reputation that the site has incurred over a number of years (Claude and Zaccour, 2009). For tourism at any given site to remain sustainable Claude and Zaccour recommend that the number of tourists should be limited and the environment and amenities should be well taken care of. By controlling the flow of tourists to an area, a site can better ensure that each individual tourist is having a positive experience. Also, investing in maintaining the environmental aspects of the site ensures that future tourists will continue to have a positive experience at the site. If these two factors are considered in a management plan, the site is less likely to see a decline in visitor numbers as the reputation of the site would likely be held in higher regard within the tourism industry. Mount Everest in Nepal presents an excellent example of a site that draws great deals of tourists but may face a decline in the future due to the lack of maintenance of the area. Many articles have been written commenting on the large amount of garbage and human faeces in the area (Walsh, 2013). If Nepal does not make any attempts to limit visitor numbers or invest in the environmental integrity of the site visitor numbers may decline in the future.
2.1. Natural Sites as Tourism Destinations

Tourism that involves nature and natural sites has always been popular but seen a significant increase in recent years (Bentley, Cater and Page, 2010). The World Tourism Organization (WTO) estimates that the market for nature-based tourism is expanding at a much faster rate than that of general tourism (WTO, 2006). There are many possible reasons for this, for example the purported mental health benefits of relaxing or exercising in nature or the increasing flexibility in vacation time provided by progressive workplaces (Bell et al, 2007). There are many forms of nature-based tourism that have emerged and are still developing.

Nature-based tourism includes visiting relatively unaltered natural areas that provide a platform for the appreciation of a number of natural elements including vegetation, wildlife, and cultural heritage (Deng, King, Bauer, 2002). Nature tourism and visits to natural sites can be a very inclusive form of tourism as there are both active and inactive ways to appreciate nature. For example, both sitting on a bench in a National park or skiing down a backcountry mountain would both be considered nature tourism but involve very different levels of skill and exerted effort (Bell et al, 2007). Additionally, the average person is increasingly likely to know more about flora and fauna than in the past due to more accessible information from widely available sources accessible directly on portable electronic devices. This has resulted in a very wide demographic participating in nature-based tourism and visiting natural sites which should be taken into consideration when designing safety management plans for nature-based visitor sites.

Generally coastal areas serve many purposes including but not limited to: fishing activities, agriculture activities, and human settlements. In 1998 National Oceanic and Atmospheric Administration, (NOAA) stated that governments need to prepare in depth management plans for these high use, multi-resource coastal areas to ensure that they remain intact and are not used in a way that could harm users or the environment. The health of coastal areas which includes clean water and robust ecosystems is at the core of what keeps coastal tourism a vibrant and growing industry. Without these conditions present in a coastal area it would be unlikely that the site would draw visitors.
However, with the development of nature based tourism comes the risks that accompany sites associated with this booming industry. The three main risks involved in nature tourism are: risks to ecosystems, risks to socio-economic systems, and risks to tourist’s health and safety (Kuenzi and Mcneely, 2008). Nature based tourism has had both positive and negative outcomes on the environment and surrounding areas of a site. On the one hand, the increased human presence in a natural area can lead to site degradation and pollution. But this increasing emphasis placed on the value of natural sites has led to the creation of more protected areas and management plans that assign more value to the long term sustainability of a site (Kuenzi and Mcneely, 2008). Many countries rely so heavily on income from tourism that it cannot be foregone to ensure the environmental integrity of an area remains (Kuenzi and Mcneely, 2008). In this case, it is especially important to ensure that the longevity of a natural site’s appeal remains intact.

2.2. Sustainable Tourism

Consumers are increasingly concerned with the environmental and sociocultural impact their travels have on host communities (Tip, 2009). This increased demand for socially responsible travel experiences rewards tourism businesses by fiscally incentivizing sustainability policies as well as ensuring the longevity of the industry within their region of practice (Tip, 2009). An element that is integral to sustainability measures is monitoring carrying capacity of a host community. McCool and Lime advocate for an approach that devolves away from a seemingly arbitrary numerical carrying capacity and towards an emphasis on the host community’s desired conditions or situations within a specific destination (McCool and Lime, 2001). Zelenka and Kacetl acknowledge McCool and Lime’s theories but further mention the oversimplification of carrying capacity to a maximum allowable number of visitors per day (Zelenka and Kacetl, 2014). Zelenka and Kacetl maintain this simplification causes issues for two reasons, the first being that the rate of tourism impact on a community is not linear and the second is that not all visitors display the same behaviour at a site as situational circumstances can change (Zelenka and Kacetl, 2014). For example, during the wintertime in Þingvellir National Park, Iceland the trails are
not cleared of ice or snow which results in visitors walking in non-designated areas to avoid slipping.

A triple bottom line approach can be applied to tourism that uses economic, social and environmental indicators that are closely monitored to ensure sustainability of the industry. Without considerations towards the ethical and cultural aspects of the economy the industry could result in market failure (Stoddard, Pollard, and Evans, 2010). According to Jarvis, Stoeckl, and Liu, increased trip satisfaction is influenced by economic, social and environmental factors as well as the activities of seemingly unconnected industries (Jarvis, Stoeckl, and Liu, 2016). The host community’s activities as a whole need to be considered in management plans as increased trip satisfaction is linked to return visits (Jarvis, Stoeckl, and Liu, 2016) which can reduceee marketing costs (Assaker and Hallak, 2012).

Sustainable tourism focuses on a wide variety of possible issues that could arise from the tourism industry including but also beyond environmental concerns. Although the environment is an integral factor, especially at natural tourist sites, socio-cultural and economic factors must be kept in mind as well (Ryan, 2002). Additionally, the applicability of the industry in multiple time frames should be addressed. The United Nations Report of the World Commission on Environment and Development (WCED) emphasizes that both present and future users of tourism resources are stakeholders. Sustainable tourism within this frame then cannot impede on the future user’s ability to use the resource (Visser and Brundtland, 1987). For example, if access to a tourist site is not properly managed and the site’s environmental integrity is degraded this would be negatively affecting the future users of this resource.

A key issue in sustainability of the tourism industry is the demand for the existence of the industry in a destination. If the supply is greater than the demand, host communities will lose money and the industry could face unfortunate effects (Liu, 2003). Demand simply won’t increase forever and managers need to plan for an eventual levelling off of demand or in some cases a decline in demand (Liu, 2003). Competition around the world for different
tourist destinations is increasing, and with this competitiveness tourists are doing more research to get a deal they find acceptable (Claxton, 2016). For a destination to remain competitive it needs to provide a quality experience for a price that tourists deem fair (Barrie, 2015). In a world with TripAdvisor, tourism destinations cannot hide from reviews depicting detailed descriptions of experiences both positive and negative. Due to this wealth of information and the willingness of consumers to do their research, a host community has to closely manage and monitor to ensure a positive experience for tourists.

### 2.2.1. Host Stakeholders and Sustainable Tourism

![Figure 5 Breakdown of Visitor Safety Issues, Anika Truter, 2017](image)

As seen in Figure 5, the main issues regarding visitor safety are threefold. First and foremost, host countries and institutions have the ethical responsibility to keep visitors safe. According to the World Tourism Organization’s (WTO) code of ethics, physical and environmental risks should be addressed when tourists are not familiar with the natural effects of their destination and if the tourists will be exposed to emergencies as a result of exposure to the
natural environment (WTO, 1996). Host countries should address the differences in natural surroundings that guests might encounter to avoid causing stress to the tourists, the support organizations that will be called upon to assist them, as well as the industry itself. Just as some tourists are not aware of appropriate behaviour around wildlife (Nilsson, 2012) they can also be unaware of appropriate behaviour for other types of nature sites. Tourists often behave differently while on vacation, which might cause them to partake in riskier activities (Carr, 2002). By understanding the hazards of differences in tourist behavioural tendencies, managers can mitigate the potential negative effects that would otherwise be absorbed by supportive organizations (Carr, 2002).

Visitor safety education within the tourism context can be an interesting area to navigate. Site managers wish to draw tourists to their site and can encourage this by presenting leisure options and enjoyable recreational activities to visitors. However, site managers have an obligation to communicate potential risks of the site yet they do not wish for their site users to feel uneasy or unsafe at the site as that undermines the purpose of their visit which is generally to have fun and relax (Ballantyne, Carr, and Hughes, 2005). But hazard communication should not be neglected as publicity surrounding fatalities and accidents can also be harmful to a destination’s reputation (Ballantyne, Carr, and Hughes, 2005). Therefore, a balance must be found where risks are communicated fully in a way that does not significantly interfere with marketing efforts.

Second, unsafe activities in general create negative associations with the particular activity, as visitors’ perception of risk outweighs the benefits. Safety is an issue that affects a user’s experience and will influence their assessment of the quality of their destination (WTO, 1996). A person’s perception of an activity’s risk is constantly changing as they assess new sources of information either directly or indirectly from various communication channels (Wachinger et al, 2012). Negative media about a certain activity or destination can modify a person’s perception of risk as those without direct experience with the risk are likely to use media to fill the gaps in their knowledge (Wachinger et al, 2012). Safety standards improve the lives of all involved in the tourism industry including those seemingly removed from the safety issue at hand (WTO, 1996). Tourism will often slow for a time in an area that has
been host to a safety incident. It may take large investments into marketing efforts before tourism can if ever reach lucrative levels again (WTO, 1996). This can in turn impact those involved directly and indirectly in the tourism industry.

A tourist’s experience of a physical area depends heavily on the other tourists at the site (Ryan, 2002). If tourists injure themselves, it significantly decreases the quality of their experience but it also infringes on the enjoyment of others at the site. Witnessing a traumatic event is likely to negatively influence tourists (Goodman et al., 1998) and potentially degrade the quality of their visit to the site. If tourists are consistently injuring themselves at this site, they are potentially causing a deterioration in the user experience for all site visitors present at the time of injury. Therefore, if visitor perceptions of the area are to remain positive (and therefore increase the likelihood of continued use of the area as a tourist destination), the number of injured tourists needs to remain as low as possible.

Third, in addition to negative tourist perceptions, accidents at a site have the potential to cause undue stress to host communities such as tour guides and emergency response teams (Jordan, Vogt, and Deshon, 2015). Other than the tourists themselves and international organizations (i.e. World Trade Organization), there are three major “host” stakeholders involved in the global tourism industry: governments (national, regional, and local), communities, and organizations/companies involved in the tourism industry (i.e. tour operators) (Kuenzi and Mcneely, 2008). Each of these host stakeholders play a wider role in the development and success or detriments of the tourism industry in a given area. Regional and local governments in the context of tourism stakeholders are in the role of promoting tourism to an area as well as ensuring conservation of the sites. Various operators and organizations that are directly involved in the tourism industry are responsible for the development of the industry as well as providing services such as accommodation and guides to tourists (Kuenzi and Mcneely, 2008).

Given the complex relationships discussed above between tourists and the communities that host them, it is important to understand the wide range of stakeholders that constitute the
host community. The relationships between the numerous host stakeholders can be complex and site specific especially as the destination develops and grows (Presenza and Cipollina, 2010). The benefits of collaboration between stakeholders includes: less conflict, more collaborative action, and enhanced coordination of policy creation (Bramwell and Sharman, 1999). Although there is a spectrum of stakeholder involvement within the industry most people within a host community are affected to some extent by its activities. Some stakeholders are directly involved in the industry such as hotel owners and tour operators, while some are indirectly involved such as restaurant owners and civil servants. Some scenarios of tourism impacts can involve issues such as emergency response teams having more work due to an increase of people in the area and residents in host communities experiencing increased prices for goods and services.

Understanding the role of stakeholders, particularly in host communities, is an integral part of sustainable tourism. UNESCO defines sustainable tourism as, “tourism that respects both local people and the traveler, cultural heritage and the environment (UNESCO, n.d.)”. The International Council on Monuments and Sites defines sustainable tourism as, “a level of tourism activity that can be maintained over the long term because it results in a net benefit for the social, economic, natural and cultural environments of the area in which it takes place (Global Development Research Centre, n.d.).” The tourism industry influences a broad range of industries within host communities. If tourism within a given area is not developed in a sustainable way, it can ultimately ruin the basis of a destination’s appeal (Byrd, 2007). Generally, tourism is positively received by host communities but if not managed properly can have adverse effects on a community’s economy, environment and socio-cultural practices and norms (Andereck et al., 2005).

Therefore, one aspect of sustainable tourism strives to reduce impacts on host communities, as tourism impacts can be very far reaching for a variety of different stakeholders (Andereck et al., 2005). A stakeholder within the tourism context is defined as, “any group or individual who can affect or is affected by tourism development in an area (Freeman, 1984).” Tourists are increasingly demanding travel experiences with reduced environmental and sociocultural impacts (Tip, 2009). Issues can come about within sustainable tourism management when
stakeholders do not understand each other’s needs and goals. All of the stakeholders should form a partnership that aims to provide each group involved with a feeling of responsibility for the management decisions that are made (Bell and Morse, 2004). Stakeholders need a clear plan for the development of the industry in addition to an understanding of the concept of sustainable tourism (Timur and Getz, 2009).

Management of coastal sites through a variety of supportive organizations has aimed to lessen the likelihood of potential hazards negatively impacting a visitor’s user experience. This can be done through a variety of methods and is usually chosen on a case by case approach as hazards can vary greatly from site to site. The potential lack of knowledge of the hazards that await users at a site can cause safety hazards for visitors, and management and planning obstacles for host communities. Local people have the advantage of being familiar with various hazards and appropriate behaviour for a site. There are many popular coastal tourist destinations that have implemented thorough programs to ensure the safety of site users. Australia, Canada, and Hawaii present excellent examples of how to use risk management and visitor safety management to negate the potentially hazardous impacts of coastal sites on tourists (Surf Life Saving Australia, n.d.), (Parks Canada, 2013), (Hawaii Beach Safety, n.d.). Furthermore, the management arrangement and decision making process between host stakeholders needs to be clearly defined in order to streamline the process. Most people agree that the UNWTO’s charter of ethical tourism should be applied to strive for a net benefit to those involved in the present and future of the industry, however unclear and complicated management structures can hinder these aims (Ryan, 2002). Tourism sustainability as a goal of supply chain management emphasizes various factors that need to be assessed when creating a management and decision making structure (Zhang, Song, & Huang, 2009). Some of these factors include demand management and the relationships between stakeholders and resources (Zhang, Song, & Huang, 2009). By observing the relationships between the tourists, the suppliers, and the non-business entities such as the government and the environment, managers can plan more effectively through visualization. Since every tourism destination will vary greatly in power structures and relationships, supply chain mapping can clarify how the management process can improve in efficiency by creating a more conventionalized management structure.
It is widely recognized that stakeholders in the host community need to work together to achieve the most streamlined management process for a destination (Jamal and Getz, 1995). Gray goes beyond the multitude of statements encouraging collaborative management processes and outlines the steps required to reach and maintain this process (Gray, 1985). All three stages of the process along with the required conditions and subsequent actions are laid out in Table 1. The first stage involves designating the key issues at hand as well as the stakeholders involved and extent to which they have power/investment in the issue. In the second stage the previously identified stakeholders designate common values and goals. The final stage is an ongoing process that involves the implementation of the shared goals and the assignment of tasks as well as development of a plan for ongoing monitoring and metrics. Although this process does not officially outline a management structure it can assist in the development of one as step two clarifies the roles and power levels of the various stakeholders.
<table>
<thead>
<tr>
<th>Stages and Propositions</th>
<th>Facilitating Conditions</th>
<th>Actions/Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1: Problem Setting</td>
<td>Recognition of interdependence</td>
<td>Define Purpose and domain</td>
</tr>
<tr>
<td></td>
<td>Identification of a required number of stakeholders</td>
<td>Identify convener</td>
</tr>
<tr>
<td></td>
<td>Perceptions of legitimacy among stakeholders</td>
<td>Convene stakeholders</td>
</tr>
<tr>
<td></td>
<td>Legitimate skilled convener</td>
<td>Define problems/issues to resolve</td>
</tr>
<tr>
<td></td>
<td>Positive beliefs about outcomes</td>
<td>Identify and legitimize stakeholders</td>
</tr>
<tr>
<td></td>
<td>Shared access power</td>
<td>Build a commitment to collaborate</td>
</tr>
<tr>
<td></td>
<td>Mandate (internal or external)</td>
<td>by raising awareness of interdependence</td>
</tr>
<tr>
<td></td>
<td>Adequate resources to convene and enable collaboration process</td>
<td>Balancing power differences</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Addressing stakeholder concerns</td>
</tr>
<tr>
<td>Stage 2: Direction Setting</td>
<td>Coincidence of values</td>
<td>Collect and share information</td>
</tr>
<tr>
<td></td>
<td>Dispersion of power among stakeholders</td>
<td>Appreciate shared values, enhance perceived interdependence</td>
</tr>
<tr>
<td>Stage 3: Implementation</td>
<td>High degree of ongoing interdependence</td>
<td>Establish rules and agenda for direction setting</td>
</tr>
<tr>
<td></td>
<td>External mandates</td>
<td>Organize subgroups if required</td>
</tr>
<tr>
<td></td>
<td>Redistribution of power</td>
<td>List alternatives</td>
</tr>
<tr>
<td></td>
<td>Influencing the contextual environment</td>
<td>Discuss various options</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Select appropriate solutions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Arrive at shared vision or plan/strategy through consensus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Discuss means of implementing and monitoring solutions, shared vision, plan or strategy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Select suitable structure for institutionalizing process</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assign goals and tasks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor ongoing process and ensure compliance to collaborative decisions</td>
</tr>
</tbody>
</table>
2.3. Managing Visitor Safety: Guiding Principles

There is no one size fits all approach to managing visitor safety, but there is a set of guiding principles set out by the UK Visitor Safety in the Countryside Group (VSCG) that can assist in the successful development of a visitor safety management plan for a specific site (Visitor Safety in the Countryside Group, 2003). The VSCG was established in 1997 by land owners and specialist safety advisors wishing to provide safe access to their natural areas. The framework is unique in that it was designed to be applicable to a number of different natural site types including but not limited to nature reserves, parks, gardens, and historic monuments. The designers of the framework encourage users to modify the contents based on the specific goals and circumstances of an individual site. This framework is one of the more recently published frameworks (2003) that has not been created to be applied to one specific region’s natural elements. VSCG’s framework has been endorsed by Britain’s Health and Safety Executive as well as being recognized by the British courts as a suitable approach to natural site risk management.

The principles outlined in the framework align with the aims of this thesis as factors such as nature conservation, visitor safety, and risk management are addressed. Additionally, the values of this framework align with those of the minimally managed, immersive nature experience which Iceland is known for. The rubrics created by the VSCG give host stakeholders a mechanism for creating appropriate metrics for their site.
### Table 2 Visitor Safety in the Countryside Group Guiding Principles at a Glance, 2003

<table>
<thead>
<tr>
<th>Principle</th>
<th>Description</th>
</tr>
</thead>
</table>
| Fundamentals    | Take account of conservation, heritage, recreation, cultural and landscape objectives  
Do not take away people’s sense of freedom and adventure  
Avoid restrictions on access |
| Awareness       | Assure that visitors know the risks they face  
Inform and educate your visitors about the nature, and extent of hazards, the risk control measures in place, and the precautions that they should take |
| Partnership     | Recognize that people taking part in similar activities accept different levels of risk  
Recognize that risk control measures for one visitor group may create risks to others  
Work with visitor groups to promote understanding and resolve conflict |
| Responsibility  | It is important to strike a balance between visitor self-reliance and management intervention  
It is reasonable to expect visitors to exercise responsibility for themselves  
It is reasonable to expect visitors not to put others at risk  
It is reasonable to expect parents, guardians and leaders to supervise people in their care |
| Risk Control    | Assess risks and develop safety plans for individual sites  
Risk control measures should be consistent  
Risk control measures should account of wider benefits to society  
Monitor the behaviour and experiences of visitors to review visitor safety plans  
Make sure that your work activities do not expose visitors to risk |

The five guiding principles stated in table 2 are as follows: fundamentals, awareness, partnership, responsibility, and risk control. The first principle, fundamentals acknowledges the issues inherent in micromanaging a site. Generally, visitors flock to natural sites to embrace nature and don’t want their experience impeded with excessive signage that degrades their experience. The second guiding principle, awareness, addresses that proper information about risks and mitigation strategies should be communicated in a manner that is appropriate to the site. The third principle acknowledges the varied demographics and visitor attitudes that can be encountered at a natural site. The same hiking trail can be used by highly skilled trail runners or a family with young children. The very different needs of
these site users need to be considered when deciding what management is appropriate for a site. The fourth principle, responsibility addresses that not all the risk should be assumed by the site managers as site visitors should be aware of some of the risks of entering natural areas and they should be expected to behave accordingly. The final principle, risk control, outlines the need for a risk management process that is tailored to each individual site (Visitor Safety in the Countryside Group, 2003).

![Risk Control Matrix](image)

*Figure 6 A risk control matrix. Visitor Safety in the Countryside Group, 2003*

The Visitor Safety in the Countryside group has also created a risk control matrix consisting of three key safety management aspects that should be considered when creating a visitor safety management plan.
As can be seen in the Figure 6, the remoteness of the location and the type of terrain the site is situated on should be considered when creating a safety plan as both of these factors can potentially create hazards and increase the risk of a given site. The more developed the site is in terms of mobility and the more accessible the site is to emergency services the lower the risk present at the site. The second factor that should be covered is the expected level of skill of the visitor and the enforcement of required skills at the site. If the site is not safely accessible for unskilled or novice users, this should be communicated to the visitors in some form. The final factor is the extent to which the site managers want to be involved in the visitor’s experience. Management can choose to play a passive role at the site or a highly involved role which might involve greater presence of staff at the site.

2.4. Risk Analysis Theory and Practice

Risk management plays a vital role in identifying and addressing risks within the tourism industry (Robertson, Keane, and Moore, 2006). Within the process, various stakeholders need to be consulted as they can be directly or indirectly affected by the implications of the management strategies that result from the plan. The purpose of this process is to prevent any unfortunate incidents that may occur but also to provide a plan in the instance that any incident should occur (Henderson, 2007). Tourism is an industry that is particularly vulnerable to risk due to the crossing of national and international boundaries with foreign nationals entering an unfamiliar area (Henderson, 2007). Tourism managers are required to “detect signals, prepare and try to prevent, contain, limit damage and pursue recovery (Pauchant and Mitroff, 1990).” The risk management process can be applied to any preventable disaster, such as seen in many hazardous coastal sites involving tourists.

The risk management process aims to protect individuals from potential negative impacts to their physical and mental health, but also their social reputation. An issue arises when there is a difference in a site visitor’s perceived risk and the real risk. If the visitor assesses the site to be less risky than the real risk they might engage in reckless behavior unbeknownst to themselves. While if a visitor perceives the risk to be higher than the real risk they might not enjoy themselves at the site as they could be worried about the level of risk. However,
real risk is a quantitative figure while perceived risk is qualitative and can be harder to assess because it’s subjective.

Risk stems from three main hazards: people, equipment, and environment. Below in figure 9 are some examples of the types of issues that could stem from these three hazard types (Outdoor Leader Online, 2011). Table 3 gives examples of these types of hazards at a coastal site which has been adapted from Outdoor Leader Online’s skiing example. The skiing example featured hazards for people, equipment, and the environment but was adapted based on the definitions given in Outdoor Leader Online of hazards related to people, equipment and environment. When creating a management plan for a specific site these three types of hazards need to be assessed. Awareness of the demographics of people that will visit the site can help to assess what types of safety infrastructure are necessary. The people using the site will also influence the equipment required to access the site as well as the hazards that accompany it. Hazards stemming from the environment of a site can be especially difficult to plan for because of the level of unpredictability. It can be very difficult to predict if a dangerous animal will cross your path or if the weather will interfere with your activity at a site. By considering these factors in a management plan the risks can be minimized through implementation of safety infrastructure.

Table 3 A list of possible hazard examples. Outdoor Leader Online, 2011

<table>
<thead>
<tr>
<th>People Hazards</th>
<th>Equipment Hazards</th>
<th>Environment Hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unfamiliar with coastal/beach areas</td>
<td>Lack of signage or confusing messages</td>
<td>Sneaker waves and strong undertow</td>
</tr>
<tr>
<td>Non-swimmer or poor swimming skills</td>
<td>Failure of rescue equipment</td>
<td>Dangerous marine life</td>
</tr>
</tbody>
</table>

Visitor knowledge and information plays a large part in how responsive visitors are to safety warnings. Site visitors respond best to teleological signs that indicate the reasons for safety implementations (Marschall, Granquist, and Burns, 2017). When visitors are told what to do
and why they should do it they are far more likely to listen than when they are simply instructed what to do without further explanation (Marschall, Granquist, and Burns, 2017). However, this information is only useful if the user can actually interpret it. Visitors encounter an unconscious cost benefit analysis when they view a sign, as they can perceive that reading the sign is more effort than it is worth (Resnick, 2008). This can be the case if the sign is poorly placed or difficult to read due to small lettering or other circumstances. This can also occur when a person believes they are already aware of the risks at the site which is why monitoring visitor perceptions of hazards can be useful in designing safety implementations. Additionally, the value of compliance must be clearly recognizable or visitors may choose to ignore the signage although they have fully understood the message being conveyed (Resnick, 2008).

Although it can often be described as the elephant in the room that no one wishes to discuss, the level of acceptable risk at any site should be assessed. Acceptable risk is defined as, “the level of human and property loss that can be tolerated by an individual, household, group, organization, community, region, state, or nation (US Legal, n.d).” It can be uncomfortable to deem a certain number of deaths at a site as acceptable but it is unrealistic to define acceptable risk as 0 deaths per year at any site that has risk present. This figure should be determined to evaluate how resources should be allocated for site management to arrive within the acceptable risk frame. Any risk that is currently observed at a site without affecting site user numbers in a distinct way can be deemed acceptable (Fewtrell and Hunter, 2013). As long as users are informed of the risks at a site and choose to use the site regardless then there should be a level of acceptable risk.

2.5. Management Program Options and Approaches

Certain tourist destinations have had a long term growth process which has resulted in detailed plans that include well developed visitor safety management plans. The regions with the most sophisticated safety management plans are in developed countries with a long history of tourism. The popular tourism locations reviewed in this section of the literature review all host activities that could be perceived as hazardous to visitors. They are all coastal
destinations chosen because they demonstrate comprehensive responses to the coastal hazards experienced at their tourist sites. The Icelandic sites chosen for review were selected to demonstrate past issues with visitor safety at a variety of different visitor sites.

2.5.1. Hawaii

Hawaii is currently dealing with multiple deaths and injuries in a year at some of their popular beaches. The state is taking measures such as working with airlines to increase safety messages relayed to tourists. Regardless of these safety initiatives, 147 visitors have died since 2012 from coastal tourism related accidents (Riker and Eagle, 2016).

The state has also developed a website that provides real time details about conditions at all of the popular beaches in Hawaii. The website is Hawaiibeachsafety.com and it is the first link that appears when ‘Hawaii beach’ is typed into Google. This easy to find site provides users with information about beach and nearshore conditions and offshore conditions using a color coded warning system. Additionally, information on the weather conditions, surf conditions and amenities are given as well as information about if and when a lifeguard is posted at the beach. By ranking the current hazards at the beach in real time, visitors can assess whether it is safe to visit the site that day or not. The site also provides information that the average beach user could not derive just from visiting the beach. The site for Hawaiian beaches also has a list of closed beaches on the side bar.

2.5.2. Canada

Parks Canada has developed many in depth management plans for the more than 40 National Parks in the country. Each site is analyzed individually to assess potential safety issues for dealing with in an action plan. In 2010 Parks Canada developed a management plan for Pacific Rim National Park Reserve which has numerous potentially hazardous beach and nearshore areas which are heavily visited. The outlined plan included three clear targets that aimed to reduce park safety incidents from the current statistics, clearly understand the safety issues in the park, and to utilize collaborative efforts to strengthen the park’s safety response.
capacity. Under these clear, concise targets, a clear action plan is outlined to achieve the targets.

Pacific Rim clearly states on the Parks Canada visitor website that all beaches in the park are unsupervised. However, a detailed list of potential hazards along with suggestions on how to mitigate exposure risk is provided. This list includes: hypothermia, rip currents, large waves, tides, rolling beach logs, and tsunamis. By providing this information on their website visitors can equip themselves with the knowledge of these hazards before ever setting foot on the potentially hazardous coastal site.

Parks Canada is quick to respond to meteorology warnings in the area that affect user safety and experience in the park. On October 11th, 2016 strong storm warnings were predicted that would cause coastal safety hazards at a number of popular sites in the park. Parks Canada responded to this weather warning by issuing a hazard advisory for Pacific Rim National Park. Additionally, managers at Pacific Rim were at the ready to close beaches and parking lots that were affected by dangerous flood levels and unsafe weather. These closures would be marked by temporary signage at the affected sites. Additionally, the park’s management designated a few areas for those that enjoy storm watching to participate in this activity in a smaller, easier to monitor area. This way if any incidents occur while individuals are storm watching it would be easier to locate endangered site users within this narrower frame (Bell, 2016).

In addition to its national and provincial parks, British Columbia also has a vibrant marine sports fishing industry that has the potential to be very hazardous to participants if safety measures are not followed. However, the federal Department of Fisheries and Oceans was not interested in getting involved in training requirements and customer safety regulations. To promote better safety for employees the Sport Fishing Institute, an industry-led association of businesses involved in saltwater angling, worked with the provincial Government’s Industrial Training Authority to develop a voluntary incentivized training initiative for saltwater angling guides. Guides that become certified can use this standard to promote their services, and additionally they will receive a $1.000 training credit as well as
receiving reduced rates of insurance for their vessel each year. This voluntary program was established to support the development of an industry that provides excellent customer service and high standards of safety. The certification process involves completing a number of Transport Canada required courses and providing evidence of 750 hours of guiding experience. By incentivizing this certification process the industry can ensure that the reputation of the industry remains high by providing high levels of service and safety to customers. Similar safety-based training approaches are being discussed for the whale watching and marine eco-tourism service providers.

### 2.5.3. Australia

Between July 2015 and June 2016, 280 people drown in Australian waterways, a number that has been relatively constant between 2005-2016 (Royal Life Saving Society, 2016). Surf Life Saving Australia is an organization that is dedicated to reducing the coastal drowning rate by 50% by 2020. Surf Life Saving Australia has created a database that serves as a framework for assessing risk at all ocean beaches in the country. The database has information about each beach’s hazards, accessibility, and site conditions. With this information the organization can determine any given site’s level of risk as well as the associated management strategies that would be appropriate for the level of public use at each site. This framework can assist coastal managers in minimizing the effects of coastal hazards through visitor information. This framework can also provide an indication to coastal managers that it may be time to close a certain site if the risk is too high.

Additionally, this non-profit organization has created a website and a complementary app that provides real time information about conditions of beaches in Australia. Included on the website is information regarding “patrol services, hazards and facilities as well as weather, swell and tide details” (Surf Life Saving, n.d). The website also has information on how to stay safe from different kinds of dangers including rip currents, reefs and rocks, and dangerous marine life. The site includes information on first aid, different types of flags and warning systems used on the beaches and appropriate gear. All of this information can be viewed in seven different languages as Australia acknowledges that tourists are coming from
a variety of backgrounds and should not be excluded from this potentially lifesaving information.

2.5.4. Icelandic Sites

Iceland is no stranger to serious injuries and fatal accidents of tourists. For example, there were over 200 traffic accidents involving tourists in Iceland in 2015, compared to under 50 in 2002 (Gunnarsson, n.d.). Due to the plentiful unfamiliar and hazardous landscapes in the country tourist accidents occur every year. In 2010 a man died in the West Fjords at the Lárabjarg bird cliffs when he accidentally fell over the cliff’s edge. Since then more adequate signage has been installed at the site to warn tourists about the dangers of the crumbling cliff’s edges and the possibility of falling into puffin nests (Pétursdóttir, 2010). In 2015 a woman died instantly at Jökulsárlón when one of the amphibious boats accidentally reversed over her. Jökulsárlón management responded to the situation by fencing off the area vehicles drive on as well as installing signage advising visitors to remain outside of the fencing (Iceland Monitor, 2015). In January 26th, 2016 a woman died while diving at the popular tourist destination, Silfra. Following the accident, Þingvellir national park’s ranger: Ólafur Örn Haraldsson called for stricter rules and regulations at the site. In October 2016 a man was seriously burned at Flúðir, when he fell into a geyser while walking in an off limits area (Hafstað, 2016, C). There is however criticism that signage and fences in this area are inadequate. All of these accidents could likely have been prevented if adequate safety infrastructure had been in place at the opening of these sites as tourist destinations. Instead, the additional safety provisions were only implemented after a tragedy struck the site.

There are multiple tourist deaths each year from traffic accidents in Iceland. A car rental company in Akureyri noted that a disproportionate amount of traffic accidents occurs among Chinese drivers (Hafstað, 2016, B). This company provides more information on safe driving to Chinese drivers than other tourists in an attempt to keep those individuals safe. Additionally, the Icelandic Transport Authority is working with the Chinese embassy to ensure safer experiences for Chinese drivers in Iceland. This large increase in tourist accidents is putting a strain on Icelandic ambulance workers. The number of ambulance calls
has increased by around 50% in the past 5 years which is incredibly significant and the number of ambulance workers has remained stagnant (Hafstað, 2016, D).

Iceland has not been taking the appropriate steps to address safety issues at many popular, high use tourist sites. Although many measures are taken to improve safety measures following an accident, this is not the most effective way to manage a hazardous tourist site. Site operators should constantly be evaluating new ways to make sites safer, instead of waiting until an accident occurs to increase measures. Considering tourism drives the Icelandic economy, Icelanders can’t afford to neglect this industry as they have been.

2.6. Tourism in Iceland

Even during the previously quiet winter months, tourism in Iceland has shot up dramatically. In 2016 Iceland saw 1 792 201 visitors which is a 39% increase from 2015 (Ferðamálastofa, 2017). The forecast for 2017 predicts a 35% increase in total tourists from 2016 which equates to approximately 2.37 million tourists visiting the country in 2017 (Íslandsbanki, 2016). As an example as to how far reaching the tourism boom is, the rapidly growing number of visitors each year paired with scant regulations surrounding the industry have many Icelanders fearing another economic crash is on the horizon (Valdimarsson, 2016).

According to the Icelandic Tourism Board, currently “tourism accounts for more foreign exchange income than the fisheries industry and aluminium production” (Ferðamálastofa, 2015). Iceland and its residents therefore rely heavily on tourism as an important source of foreign revenue. This is indicative of how integral the tourism industry has become in the Icelandic economy within the last 10 years. If tourists have negative perceptions of the country, income from tourism will decline and potentially degrade tourism revenues resulting in losses for the 21.600 people who were employed by the tourism industry in 2014 (Ferðamálastofa, 2015). On the other hand, if residents have negative perceptions of tourism in Iceland they may become hostile towards visitors resulting in a poor experience for tourists, and unfavourable tourism conditions can also have negative sociocultural influences
on locals (Doğan, 1989). The marine angling tourism industry in Iceland has faced similar issues of long term sustainability of tourism infrastructure. If the local fish stocks decline too quickly from angling tourism the industry forfeits future gains and assumes losses for the already installed infrastructure (Solstrand, 2013). For tourism in Iceland to remain sustainable, therefore, potential negative experiences for tourists and operators alike must be mitigated through comprehensive management options where residents and tourists alike derive a net benefit from the industry.

Questions of tourism management, visitor safety, and the general sustainability of the tourism industry continue to arise. Many tourist activities in Iceland come with a risk and element of danger which for many tourists is the basis of the activity’s appeal. However, even the less audacious activities can be dangerous as simply existing on the island when bad weather arrives can put an unprepared person in danger. Iceland is sold by marketers as a surreal dream, filled with remote countryside charm, northern lights, and a side of elves. While most marketing images feature calm weather and blue skies, more often than not the weather is windy, aggressive and frequently changing (Icelandic Met Office, 2008). There are many real consequences for those that don’t opt to use the utmost caution when interacting with the natural sites. Although there are no official statistics available on foreigner deaths in Iceland (Guðmundsson, 2016), in 2016 there were 4 foreigner deaths that occurred in a time span of less than two months (Hafstað, 2016, B). Guðmundsson notes that three management aspects require improvement, firstly the preventative education is insufficient, secondly the lack of infrastructure specifically within the road systems, and lastly a lack of monitoring and law enforcement due to decreased funds and increasing work load (Hafstað, 2016, B).

Tourism in Iceland is unique in that until recent years’ residents had remained the sole consumers of coastal resources whereas currently the number of tourists visiting the country outnumber residents 5 to 1 (Ferðamálastofa, 2016). With the rapid growth of tourism, a delicate relationship has developed in which residents and tourists are learning to share the space. Marin and Berkes (2010) emphasize that social and ecological aspects of coastal resource management are closely related, which in turn creates the need for adaptive co-
management and interactive governance. Management plans need to be tailored to suit the needs of both residents and tourists as their cooperation is integral to the success of the tourism industry and without engagement from residents and stakeholders the industry could fail to thrive (Jentoft, 2000).

Traffic accidents are the number one cause of tourist deaths in Iceland (Hafstað, 2017). The rescue team in Iceland is kept busy by events such as hikers in inclement weather, tourists falling into geysers, and snorkeling accidents. There are many examples in the country that show efforts being taken to improve visitor safety but a large number of the sites seeing improvement is due to a preventable accident taking place on the site. Coastal tourist sites in Iceland are host to a number of tourist accidents each year as well. To reiterate Orams defines coastal tourism as, ‘recreational activities that involve travel away from one's place of residence and which have as their host or focus the marine environment (Orams, 1999).’ In Iceland this would include activities such as kayaking, whale watching, surfing, snorkeling, scuba diving, bird watching, and general sight-seeing at coastal sites such as beaches and bird cliffs.

As a clear need is outlined for improved and increased service options and infrastructure, the Icelandic tourism industry needs to ensure that they don’t cause the downfall of the industry. By increasing infrastructure and services, the country’s wilderness to metropolis ratio will decrease thus lessening the initial draw of the country (Ólafsdóttir and Haraldsson, 2015). This is especially important considering that over 80% of tourists visiting Iceland list nature as the main reason for their visit (Landvernd, n.d.). When the area begins to evolve to meet the demands of tourists visiting the area, the amount and types of tourists who visit the area will also begin to change (Ryan, 2002). Iceland’s increasing popularity and accessibility has drawn more tourists from a wider range of nationalities. This rush has affected the way that tourists perceive the landscape due to the sheer volume of tourists now found at popular sites during the high season.
The following sections address the current sources of safety information and safety certification in Iceland as well as providing a general overview of the issues currently observed at the case study site for this thesis: Reynisfjara Beach.

2.6.1. Tourism Policy in Iceland

In 1936 Iceland created the first tourism legislation which focused on creating an agency that would draw visitors to the country and overlook the activities of the industry (Jóhannesson, Huijbens, Sharpley, 2010). In 1964 the Icelandic Tourism Board was established as a government organization to support the development of the industry (Jóhannesson, Huijbens, Sharpley, 2010). With this organization also came a fund to financially support projects in tourism. The first tourism policy was instated in 1996 and reworked again in 2005 when the state began to recognize tourism as a real industry. In the past the tourism industry appeared to only receive attention when other industries were facing challenges. This illustrates how Icelanders in the past have perceived the tourism industry as more of a contingency plan than a “real” industry. Since then tourism in Iceland has increased dramatically and has become an undisputedly core part of the Icelandic economy.

Despite this acknowledgement of the industry as integral, the shift in Iceland’s economy towards tourism has not been supported by adequate development of tourism policy (Huijbens, Jóhannesson, Jóhannesson, 2014). An attempt to regionally manage the industry through tourism clusters has raised questions as to the effectiveness of this type of top down governmental management structure in this setting (Huijbens, Jóhannesson, Jóhannesson, 2014). One of the key factors missing from the management of the tourism industry in Iceland is a lack of research. Iceland has been keen to closely research and monitor the fisheries industry but the same attention has not been paid to the tourism sector which is now similar in size (Jóhannesson, 2015). As of 2017 the tourism research centres and universities that carry out tourism research in Iceland are facing budget cuts (Jóhannesson, 2017). At this crucial time in the development of the industry, research could shed light on important issues that need to be addressed.
2.6.2. Safe Travel Project

The main source of safety information available for tourists comes from the SafeTravel project which refers to itself as, “the official source for safe adventure in Iceland.” SafeTravel has a website (safetravel.is) to provide tourists with safety advisories about a variety of safety issues they could encounter during their stay in the country. The website supplies tourists and residents alike with up to date information and warnings about conditions and hazards at specific sites and for specific activities. The website contains information about driving in Iceland, glacier crevasse maps, recommended equipment lists as well as safety information about a variety of popular activities in Iceland. There is also an option to leave a travel plan with the search and rescue team on the site. Should an emergency occur, the rescue team has a reference point of where the endangered individuals could be.

There is a direct link to contact the rescue team via Skype on the support center of the website. Another useful resource is the 112 app that encourages users to leave check-in points to update the current location of the user should an emergency occur. The app also has an emergency button that can be pressed to send a text message of the users GPS coordinates to the rescue team. This app is more useful than attempting to call the rescue team in an emergency as text messages are more likely to send in areas with limited service.

Although there are a variety of resources on the site it is not without flaws. Some of the information, for example the page on avalanche information is only accessible in Icelandic. Additionally, as of October 2016 there are a few broken links on the site suggesting that the website’s maintenance has been neglected.
2.6.3. Vakinn Certification System

Vakinn is a tourism quality control system introduced in Iceland that was adapted from a system used in New Zealand to certify quality tourism (Vakinn, n.d.). There are three branches of certification that a tourist company can apply for: Certified travel service, bronze/silver/gold class environmental certification and hotel star certification. The system is interested in ensuring excellent service standards for customers which includes standards of respectfulness for employees and customers alike, while ensuring safety and nature conservation. There are currently 83 members participating in the program with another 76 undergoing evaluation for acceptance. Membership fees are based on level of revenue which makes the system accessible for both smaller and larger companies.

Vakinn has a list of specific criteria for certifying a company for a variety of different tourist activities including caving, horse tours, snorkeling, and kayaking. Most tour companies operating in Iceland would likely choose to apply for nature tour certification among other more specific areas. Section 208, nature tours has a clear list of criteria pertaining to safety factors, environmental factors and in depth training that would ensure tours were conducted safely and responsibly for passengers, staff, and the environment. A large part of the training refers to courses provided by ICE-SAR, the Icelandic Search and Rescue association. These courses are a part of the standard rescue team training which is provided to anyone who chooses to join the rescue team and go through the two-year training program.

To qualify for Vakinn certification a company must have an all-encompassing written safety plan that is revised at least once per year. The company must also have appropriate safety equipment aboard all tours, and guides must be fully trained on how to use the safety plan and the equipment. Guides must be sufficient in communicating to guests the extent of conditions and hazards. Before setting out for a tour, guides are required to be aware of guests abilities and experience in relation to the day’s activities as well as briefed on the weather and conditions of the areas they intend to enter. These factors are all in addition to the rigorous training required of staff and guides.
All of the safety factors considered in the Vakinn nature tour plan are very basic and encompass standard safety procedures which should be in place by anyone conducting nature tours. These factors are not at all unattainable and are likely already in place to some extent by tour companies currently operating. The environmental factors revolve largely around complying with Icelandic law and ensuring that tours are not actively harming the environment in which they operate. All the safety, environmental and training conditions are highly attainable for most tour companies especially considering the tiered certification pricing system that caters to small company’s needs.

2.6.4. Reynisfjara

Reynisfjara Beach is a popular destination for tourists travelling along Iceland’s south coast. The site is a privately owned beach situated slightly west of the town of Vik. The site is owned by numerous farmers that collectively own the surrounding farmland as well as the popular tourist site. The site can be accessed by turning off the highway one, “Ring Road,” onto the Reynishverfi neighbourhood. The road is not paved the whole way, and at times becomes a single lane road. Upon arrival at the site there is a parking lot (as seen in Figure 7), a restaurant, and a set of public restrooms. The site is open year round, but is accessed most during the summer season which is the highest tourist season in Iceland.

Figure 7 Reynisfjara Map, Já.is, 2017
There have been two deaths in ten years at this site (and one at the adjacent site Kirkjufjara). There have also been a number of near death events (of which the statistics in Iceland are not currently available), some of which have been filmed and photographed (Iceland Monitor, 2016). There is currently no infrastructure in place to measure or document the frequency of non-fatal accidents at Reynisfjara as the site is not manned and there are no security cameras on site. Reynisfjara is frequently in the news in Iceland as tourists continue to put themselves in danger in the waves. In 2015, South Iceland saw seven deaths and of the 245 tourist injuries that occurred in the country, 37% took place in South Iceland, the region where Reynisfjara Beach is located (Iceland Monitor, 2016). Currently the entirety of the South Iceland region, which spans 32,000 km², is serviced by 34 police officers (Iceland Monitor, 2016). Due to the concern reported by tour operators, changes to the safety protocol and general tourism management for the beach are a high priority. One tour operator has made the decision to no longer offer tours to this beach due to safety hazards. The volunteer rescue squad, ICE-SAR, is frequently called to this location as visitors fail to heed posted safety warnings and are swept out to sea (Figure 8).

![Tourist caught in the waves at Reynisfjara](image)

*Figure 8 Tourist caught in the waves at Reynisfjara. Photo: Kristján Guðmundsson, 2016*

The head of ICE-SAR and the South Iceland Police have considered introducing a manned safety system at this location (Iceland Monitor, 2016). Jónas Guðmundsson, project manager
of ICE-SAR, has indicated that while education and prevention has been addressed through the SafeTravel project, the infrastructure still does not exist to deal with the significant increases in visitors Reynisfjara Beach experiences each year (Hafstað, 2016, A). He has also stated that enforcement would be helpful at the site, however the South Iceland police are already facing downsizing and budget cuts even during this time of increasing emergency response calls (Hafstað, 2016, A). Currently the SafeTravel website does not feature any information on the dangers of Reynisfjara beach. There is small section of the website that mentions dangers of swimming in Iceland because of strong currents. This section could easily be updated to include information about Reynisfjara’s dangers. There have been two attempts to improve hazard communication through signage at Reynisfjara Beach. Up until February 2016 following the second tragic death at Reynisfjara Beach, there was only one large sign (Figure 9) on the trail leading from the parking lot to the beach.

![Figure 9 Original sign at Reynisfjara](image)

*Figure 9 Original sign at Reynisfjara Photo: Anika Truter, 2016*

Additionally, the sign was placed on the left hand side of the path lessening the likelihood of people observing the sign. Since the death of a tourist in February of 2016, two additional
signs have been placed at the site, both on the path from the parking lot to the beach. Figure 10 shows the sign added in February 2016. However, the continual observance of tourists wading into the waves and climbing the basalt columns as well as reports of ICE-SAR call outs indicate that the signs have not had a significant impact on communication improvement (Iceland Monitor, 2016).

In October 2016, the engineering firm EFLA designed a new safety warning sign (Figure 11) for the site after the previous sign created in February 2016 faced criticism. The new sign aims to eliminate any previous confusion about the dangers present at the beach. The sign covers many different elements in a clear and concise way and has a large warning of danger in 3 languages: Icelandic, English and Chinese. It also warns of dangerous sea currents, sneaker waves, and advises visitors to remain facing the beach at all times as well as supervising children. The sign also includes a clear diagram of how the waves at the site are a safety hazard and where the danger zone is. Additionally, there is a cross on the sign indicating deaths have occurred at the site in the past. To clarify the dangers even further there is a picture of a tourist engulfed in the waves along with a hypothetical news article about another tourist accident at Reynisfjara. The latest signage at the beach uses teleological
communication, which means the sign describes the type of hazard and potential consequences if ignored in more detail than simply alerting the visitor that the site is hazardous (Marschall, Granquist, and Burns, 2017). An example of a non-teleological sign would be one that simply says, “danger, do not enter the water,” while a teleological sign might say, “danger, there are sneaker waves in the area which have claimed lives in the past.”

This site is unique in that it is a high use beach site that completely discourages any entrance into the water. Most high use beaches require close monitoring because people regularly enter the water for recreational activities including but not limited to swimming. Incidents often escalate at these beaches due to a lack of lifeguards. But should lifeguards be stationed in an area where no one is allowed to enter the water? Due to the temperature and the extreme waves it would be very dangerous to have a lifeguard swim out to an endangered person at Reynisfjara should they fall in the water. This would be an ineffective method of rescue and would likely do more harm than good for everyone in the water.

The use of beach surveillance is the most competent way to mitigate risks of drowning (Lanagan-Leitzel, 2011), however this is very costly. Iceland attempted to employ this method in the weeks following the tourist drowning in February 2016, but unfortunately the
budget simply does not exist and the surveillance was ended after a few weeks. Although winter tourism in Iceland is increasing rapidly, the summer season (June-September) still remains the high season (Ferðamálastofa, 2015). During this high season the potential for risk increases as more tourists flock to the beach. With the increase in tourists exposed to the hazards at this site the probability of accidents increase (Royal Society for the Prevention of Accidents in the UK, & Royal Life Saving Society UK, 2005). There is a sense of urgency in the management of this beach so that tourists will remain safe. Reynisfjara has created a paradox as most Icelanders agree more safety infrastructure is necessary at the site but to place restrictions on a visitor’s access or micromanage their experience would make the site feel decidedly un-Icelandic. This combined with the lack of funding for a ranger has left managers puzzled as to how to update management at the site. The fact that there are such a large number of individual hazards at the site makes the situation even more complex.

This chapter has provided readers with an overview of coastal safety, and sustainable tourism and has provided examples from destinations with comprehensive coastal safety plans. Additionally, the case study site has been introduced and issues at the site have been documented. The following chapters will introduce the methods for this project, present results and the discussion will interpret these results using information from the literature review.
3. Methodology

I approached the methodology by trying to gather as much information about the site as possible. I located a framework analysis that would allow me to benchmark the current situation at Reynisfjara. This way other sites in Iceland could compare their situations with that of Reynisfjara.

3.1. Semi Structured Interviews

I conducted semi structured interviews with 10 individuals from varying stakeholder groups within Iceland related to Reynisfjara. I interviewed local tour operators that bring visitors to Reynisfjara and have direct contact with the site. Representatives from national organizations do not have direct contact with the site on a daily basis, but are involved in the management process. The representatives from local organizations are more directly involved with the site than some of the individuals from the national organizations however, neither of these groups have as much contact with the site as the tour operators. I chose to focus on stakeholders and leave tourists out of this analysis due to the limitations of the size and scope of this thesis. Stakeholders already have a previous knowledge of the site and its operations which would likely result in a better informed decision for management purposes regarding the site.

Semi-structured interviews follow a guiding list of questions but are also flexible to cover topics that the interviewer did not include in the original list (Bernard, 2006). This method was the best way to standardize informants’ perceptions and experiences of the varying issues regarding Reynisfjara that this thesis aimed to address. Interview questions centered around the informant’s experiences as a stakeholder, and I gave prompts in the interview regarding opinions of potential management options that were developed from my literature review such as management plans, signage, infrastructure, web tools, and a variety of other available options that are found at other hazardous coastal sites. Each interview had a slightly different set of questions as each organization plays a different role at Reynisfjara. For example, a tour operator and the representative from ICE-SAR have very different interactions with the site. Tour operators are at the site on a daily basis, whereas ICE-SAR
only deals with the site when an accident occurs there. Therefore, their interactions and insights into the site are different. Some examples of questions were:

1. What changes to signage and additional management methods do you think would lessen safety issues at this site?
2. Can you explain how your agency works with other agencies regarding Reynisfjara (or other sites) and how the decision-making process works?
3. What do you think the main issue is at Reynisfjara? (ex. Communication issue, informed people refusing to listen, etc)

Before the interview, each informant was made aware of the informed consent process. Interviews were conducted face to face as well as on Skype or over the phone and ranged from 30 to 90 minutes. I took notes during each interview. After the interview, field notes were recorded in a Word file for further analysis. Analysis consisted of searching for common themes that overlapped throughout interviews. Detailed descriptions of the informants are as follows:

**Three tour operators** who provide sight-seeing tours to Reynisfjara Beach were interviewed. By doing this, I documented the current issues experienced by people who work at this site and have ample time to observe conditions and behavior at the site. I had hoped in doing so to identify gaps in safety information provided to tourists that could be addressed to reduce safety risks. I asked tour operators about their main issues and concerns with the current use of the site. I targeted this group because they have direct contact with the tourists who visit this site and I wanted to better understand their experiences and suggestions for the site’s management.

I interviewed **five individuals from national organizations** to gain a better understanding of the issues regarding this site on a spectrum of those directly and indirectly involved with the site’s management. I interviewed a representative from the country’s search and rescue team, ICE-SAR (*Landsbíjörg*) to better understand how this site influences their resources and if or when this site could begin to strain their resources. I interviewed a representative from the Icelandic Tourist Board (*Ferðamálastofa*) to understand how the site could be affected through policy changes and management of the tourism industry in Iceland in
general. I interviewed two representatives from EFLA engineering firm that conducted the risk management assessments of the site and designed and implemented the safety infrastructure seen at Reynisfjara as of 2016. I interviewed a representative from the environmental agency of Iceland (*Umhverfisstofnun*), to discover their intentions if any for the site. I was interested in documenting the intersectionality of safety concerns and environmental concerns because often the two go hand in hand.

Lastly I interviewed **two individuals from local organizations**. I interviewed a member from Vik Tourism to document their opinions of the site and to explore what information is provided to people who go to the visitor center. Additionally, I wanted to find out how Vik Tourism contributes to the management process of the Beach and how they are involved with the decisions that are made about the site. I also interviewed a representative from the South Iceland Police to better understand how the brief patrolling imitative went. I also wanted to determine how often the South Iceland Police’s resources are used in regards to Reynisfjara (call outs, involvement in management process, etc.).

### 3.2. Guiding Principles Framework Analysis

My literature review consisted of information on coastal and sustainable tourism. I searched for literature using online scholarly journal search engines. I used key words such as, “coastal hazardous tourism sites” and “sustainable tourism,” and I opted to find sources that were as recent and relevant as possible. I searched for destinations with comprehensive coastal safety management plans. I chose well established, hazardous coastal destinations as these were more likely than developing destinations to have management plans. Using results from the literature review and data from semi-structured interviews, I used a guiding principles framework to interpret my results. The five guiding principles of fundamentals, awareness, partnerships, responsibility and risk control (*Visitor Safety in the Countryside Group*, 2003) were used to assess the current situation at Reynisfjara and then provide recommendations based on the gaps in management and as suggested by the stakeholders involved in the site.
Qualitative data analysis is an ongoing process that is done concurrently with data collection as the researcher is able to use the collected data to develop new hypotheses and channels of exploration (Pope, Ziebland, & Mays, 2000). Using an analysis framework facilitates the categorization of data into different themes as they develop throughout the research process. By using the guiding principles framework, I can sort the data I have collected into various themes that will eventually point out gaps in Reynisfjara’s management strategy. The framework not only guides the analysis of data but also offers a guideline for providing suggestions to the management team of the site.

The VSCG have used their guiding principles and risk assessment for 16 case studies. Some examples of the case studies are analyzing visitor use of The Dalby Forest in England which aims to reduce environmental impact from leisure activities, The South Stack Cliffs in Wales which analyzes the risk factor of an eroding coastal path and the development of a path to reduce visitor falls in Skara Brae in Scotland. The framework is beneficial because it begins with a risk assessment for an accurate look at the current situation and then follows with the guiding principles that can be applied to the management plan based off the results of the risk assessment.

**3.3. Scope and Limitations**

This research was conducted solely about Reynisfjara Beach, however hopefully the resulting management plan can provide a framework for other high risk, high use coastal tourist destinations in Iceland. This study focused on local tour operators and applicable stakeholders at Reynisfjara Beach rather than tourists themselves because the research question centered on the responses of and impact to local stakeholders in hazardous coastal site management. Due to time constraints this thesis examined stakeholder perceptions during a relatively short time period. Because Reynisfjara is often in the news because of safety issues, my interview data had the chance to be influenced by media focus. There are a very large number of owners of the site and due to time and resource constraints none of
the owners were formally consulted within the stakeholder analysis. Finally, I am a native English speaker and that limited the amount of Icelandic tourism publications and press I was able to draw on in this thesis. Reynisfjara beach has received a great deal of attention as of April 2017. With numerous deaths and increasing popularity of the site more attention has been given than in past years. This means that during the course of this thesis many changes have already occurred at the site which has made it difficult at times to keep the content current.
4. Results

The results from the stakeholder interviews are organized into seven main topics. Each of the topics are discussed in detail followed by analysis of the situation at Reynisfjara as per the guiding principles introduced in the methodology.

4.1. Stakeholder experiences and perceptions

Overall, informants recognized the timeliness of the situation unfolding at Reynisfjara. Tourism predictions in Iceland show an upward trend with 2018 predicted to bring 2.5 million tourists to the country (Iceland Monitor, 2016). Major topics emerging from the interviews fell into two categories, physical aspects that need to be considered in a management plan, and management options as well as barriers as shown in Figure 12.

Figure 12 Mind map of topics that emerged from stakeholder informant interviews
4.1.1. Physical aspects

Wave Strength

First and foremost, informants agreed that it is nearly impossible for foreigners to understand the strength of the waves at Reynisfjara Beach if they are not informed or unless they actually witness an individual caught in the waves. Obviously it is not possible to demonstrate this to alert people to the hazards of the waves. The strength of the waves can sometimes not be seen from shore. Some coastal hazards are impossible to see from shore, such as strong undertow. And some hazards are likely only to be spotted by a trained individual, such as rip currents, which are strong channelled currents that flow away from the shore (NOAA, 2013). Although the waves are much stronger during powerful storm surges and during the winter months, the apparent “calmness” of the water in summertime can lull visitors into a false sense of security. Many travelers believe only young children and elderly individuals are at risk from the strength of the waves but the waves are strong enough to carry out adults as well.

The naivety of visitors was documented by a pair of undergraduate students, Þórdís Pétursdóttir and Sigurlaug Rúnarsdóttir, from Háskoli Íslands who visited the site for their research project. The students filmed individuals engaging in reckless behaviour even after stopping to read the safety warning signage (Rúnarsdóttir and Pétursdóttir, 2016). The students noted that when the weather was bad visitors seemed to exercise more caution, however the current can be just as strong when the weather is pleasant. This concerning research was collected after the latest sign (October 6\textsuperscript{th}, 2016) at Reynisfjara had been installed. This is a sign that clearly notes a recent death occurred at the site as well as safety warnings in multiple languages. It would appear that signage alone is not effective at communicating risk at this particular site.

Road and Vehicle Hazards

Some of the respondents were very concerned that the roads to access the site were hazardous. There is an area of the road that has just a single lane which is completely
impractical considering the often harsh weather and constant darkness during the winter. There are numerous large 50-60 passenger busses driving over these roads every day and they should be improved to ensure that visitors arrive safely at the tourist site.

Additionally, there are concerns about the current parking lot as there is no designated drop off zone for tour busses. This results in pedestrians walking in front of and behind large passenger busses and are likely walking in the blind spots of these busses at times. However, EFLA is currently designing a new parking lot that will be more organized and safer for drivers and pedestrians alike.

**Basalt Columns**

The basalt columns at the site are becoming an increasingly larger issue. There are currently no warnings about climbing the basalt columns and there are always tourists taking photos on the basalt columns. The columns are often wet from the waves or from rain or snow which makes them slippery. Slippery rocks paired with windy conditions creates a hazardous situation. In the past people have climbed so high that they were unable to get down without assistance from the rescue team.

**Hidden Dangers**

Additionally, there are many hidden dangers at Reynisfjara that prompted concern from the majority of stakeholders interviewed. The cave was mentioned on multiple occasions as when the tide is high visitors can become trapped inside it. They then either have to wait until the tide lowers which will take multiple hours, or they can risk entering the strong waves to escape. During the summertime the Atlantic Puffin nests in the cliffs that overlook Reynisfjara. To get a good view of the birds a person must turn their back on the waves which puts them at risk of not noticing unsafe positioning and people also often try to climb the cliffs and the surrounding hills to get a better look at the birds. Visitors can find themselves stuck on the cliffs or they injure themselves making their way down. Finally, some visitors will attempt to walk from Vik Beach to Reynisfjara which involves scaling
slippery rocks that have large waves crashing on them. In the past this has resulted in the deployment of the rescue team.

### 4.1.2. Management options

**Management Response**

In the interviews, Icelandic tourism management was often described as “putting out fires but not preventing them,” meaning that managers respond to significant issues as they arise but choose not to put many preventative structures into place before these issues arise. All of the stakeholders involved were keen to install additional infrastructure or make some form of changes to the site.

**Ranger**

According to the Swiss Rangers association, rangers act as “mediators between people and nature (Graf, 2016).” A ranger can provide updates to site visitors about conditions and is able to verbally warn people as well as act as a first responder. Rangers can also make the call to close a site if conditions become too unsafe or alternatively they can ask individuals who are behaving inappropriately to leave. At present if individuals are witnessing unsafe behaviour they will call the police. In the past both tourists and tour guides have contacted the police about unsafe behaviour at the site. However, by the time the police arrive on the scene the individuals are usually gone. A person can be carried out by the waves in mere seconds, so at some point the police may arrive to late in response to a call about dangerous behaviour. Every single respondent noted the need for a ranger at this site as well as other sites in the area. According to the stakeholders interviewed in this project, there is no uncertainty about whether or not a ranger should be posted at the site. Currently, the only reason there is not a ranger is due to insufficient funding from the government. However, recently some of the stakeholders have applied to increase funding for rangers.

**Signage**

Signage can be a highly effective form of visitor safety management. However, due to the nature of Reynisfjara’s conditions signage can oftentimes not effectively communicate the
severity of the conditions. Also, even if the most ideal sign is in place at the site you cannot guarantee that individuals will read it, and of the individuals who do read some will choose to ignore it. Visitors have been observed reading the signage and then choosing to ignore the recommendations. Placing more signage at the site would be more likely to degrade the visual appeal of the site than convince individuals to comply with safety warnings.

4.1.3. Land Ownership Issues

Throughout the interview process, some respondents mentioned the convoluted land ownership structure. However, this did not appear to be presented as the major obstacle that it appears to be at the site. Following the interview process, the data set appeared to be lacking in information from the land owners. After briefly speaking (due to language barrier) with one of the land owner’s at Reynisfjara who is also part owner of the Black Sand Beach Restaurant the land issues became apparent as to the extent of the obstruction to management initiatives at the site. There are over 100 site owners, and due to the legislation in Iceland all landowners must agree to a motion before it can be put into place. This is especially difficult at Reynisfjara as some of the landowners are not even known. Before these landowners can be consulted about management initiatives they must be identified and tracked down. This obstacle is the reason for the lack of management response at the sight. The 8-10 owners that own the majority of the land are eager to make management changes but are unable to do so because of the current legislation. The decision to charge for parking at Reynisfjara was halted due to an inability to get all landowners to agree to the initiative.

4.2. Guiding Principles Analysis

In this section the guiding principles will be applied specifically to the situation at Reynisfjara Beach.

4.2.1. Fundamentals

The fundamentals principle looks at the specific uses and objectives of the site and how to limit disturbance to those activities and aims. A primary goal at Reynisfjara as identified by
the stakeholder interviews for the project was to limit visual pollution. At this point in time there are numerous signs of various sizes as well as some minimal chain fencing in the parking lot area to guide tourists down the safest path to the beach. The guiding principles advise to limit installations that make a site feel less natural. If these signs are ineffective and detracting from the view a different management route should be considered.

There were some differences in opinion on how the fundamentals of the site should be managed in regards to accessibility. One of the stakeholders stated that the ideal way to manage the site is to control and improve the user’s experience by introducing an appointment system. The goal being to limit crowding and to provide the user with a more relaxed nature-focused experience. However, this individual also mentioned that the owners of the site were not interested in controlling access in this manner. Another element of accessibility was opting to close the beach on days of severely inclement weather. (It should be noted, that on February 10\textsuperscript{th}, 2016 when a man died in the waves the weather was not severe enough to consider closing the beach).

Multiple stakeholders mentioned the need for conservation measures to be considered at the site. There is concern about people climbing the hills to access the cliffs as puffins and other birds nest in these cliffs in the summer time. This disrupts their natural behaviours and could stress the birds. Since visitors are not encouraged to view the puffins from on top of the cliffs there are no instructions on following the proper bird cliff viewing such as at Látrabjarg. There is a proper technique that involves laying down to distribute weight and if tourists don’t use this technique they could fall into a nest and off the cliff harming themselves and other site visitors.

4.2.2. Awareness

The awareness principle addresses issues of visitor safety education and aims to ensure site visitors are well informed about hazards. Every single individual interviewed in this project expressed their desire to see a ranger present at Reynisfjara. Additional signage has been
installed at the site since February 2016 however, all stakeholders agreed that this wasn’t the most effective method of visitor safety management for this site. The signage should be supplemented with a park ranger present at the site. There were some differences in opinion about the extent to which the ranger would be involved at the site. Some stakeholders felt that a rotating presence between Reynisfjara and other sites in the area such as Dyrhólaey would be suitable. Others felt a ranger should be at the site every day during peak hours. All suggested that the ranger should be responsible for a colour coded flag system that would be changed as necessary indicating the current risk level at the site.

One of the respondents was present at the patrolling that occurred at the site for a week in February. The person who patrolled the site during this time mentioned that they had to talk to several people each day who were in real danger in addition to monitoring many more who were somewhat at risk. The lack of funding for this position is the only reason it hasn’t gone forward but in the short term the other management tools at the site have proved ineffective.

4.2.3. Partnerships

The partnerships principle acknowledges that various visitor groups often use the same site for different activities and aims to eliminate conflict issues between the groups. There are many different organizations that have participated in the management decision making process at Reynisfjara in some way. Kötlusetur’s role in regards to the beach has changed over time as the site’s needs have shifted. Initially the organization focused on promoting the site to tourists, but the focus has since shifted to tourist safety. During the quieter winter months the government contributed funding for the visitor centre to stay open specifically to give tourists reliable access to safety information.

Many different tour operators bring their tourists to Reynisfjara at no cost. Yet currently only one of these companies contribute funds or support to the site owners and managers. One of the respondents suggested that tour operators should be more invested in contributing
to the safety management and conservation of the site as their businesses depend on it. It seems unfair that the bulk of the fiscal responsibility of owning the site lies on the site owners when so many others reap the benefits of the owner’s investments.

4.2.4. Responsibility

The responsibility principle aims to find a balance between management intervention and visitor self-reliance. The owners of Reynisfjara have taken the responsibility of safety at the site quite seriously. Although visitors enter the site at their own risk the owners have made and are currently making attempts to make the site safer all the time. There are currently multiple clear safety signs at the site outlining the dangers of the site. Visitors who choose to ignore these signs cannot hold the site owners responsible.

The guiding principles state that: “it is reasonable to assume visitors will exercise responsibility for themselves.” People do not visit natural sites to have their experience micromanaged by the owners of the site. The appeal of Iceland’s tourism sector is the untouched wilderness and sense of freedom (Sæþórsdottir, 2010). To install more safety infrastructure at this site would detract from the basis of its appeal.

4.2.5. Risk Control

The risk control principle utilizes a matrix to assess the levels of risk at the site by looking at multiple aspects such as site user skill level and terrain difficulty. One of the respondents discussed the need for risk control and consistency with risk assessments as conditions at Reynisfjara are always changing. The respondent stated that large overall risk assessments need to be performed at least once each year but additionally a ranger should be at the site to assess the risk on a daily basis. A ranger at the site would also provide a reliable source of information about the behaviour patterns of tourists which could improve risk assessments. When a dangerous event occurs at the site a ranger would be useful for a quick response. For example, on October 12th, 2016 there was significant rainfall at Þingvellir
national park which resulted in flooding of some areas in the park (see images below). The popular waterfall, Öxarárfoss had to be closed off due to the viewing area being flooded. This was able to be executed before anyone was put at risk as there is a ranger present at Þingvellir. Although, this does not happen often the ranger’s presence was necessary and someone could have put themselves at risk trying to access the waterfall had a ranger not been there to put out adequate warning.
5. Discussion

Iceland’s economy (accompanied by the mind-sets of Icelanders) is slowly shifting away from a fishing and aluminium based economy towards a tourism dominated economy. The rapid tourist boom in relation to the country’s relatively small population has resulted in a sluggish development of industry policy (Jóhanesson and Huijbens, 2010). Some issues, such as tourist safety may go unnoticed until an event triggers an urgent response. There have been many deaths at numerous different tourist sites and following these deaths safety infrastructure was increased to a level that the site should have been operating at prior to the accident. Most Icelanders affiliated with the tourism industry are aware that this is not the ideal way to develop the industry.

5.1. Icelandic Gold Rush

In the past Icelanders have made the mistake of investing too heavily in a booming industry and neglecting to diversify their range of industries (Jakobsson and Stefánsson, 1999, Wade and Sigurgeirsðottir, 2011). Today there are visible signs of similar events occurring around the boom of the tourism industry. Jóhannesson notes that tourism appears to be spiralling out of control due to a “gold rush” mentality that has left many tourism stakeholders concerned about the future of the industry (Jóhannesson, 2015). This concern stems from a variety of factors including short term rental properties on the black market and delicate environments at high use ill managed sites (Jóhannesson, Huijbens, and Sharpley, 2010).

Throughout the interview data collection period it became apparent that some organizations have more interest in long-term investment into the tourism industry to ensure that it remains a lucrative industry in the future. Additionally, there were some stakeholders who had more direct involvement in how Reynisfjara is managed. And involvement in the management process is not directly related to how dependent the organization is on the site. For example, tour operators have very little input into how the site is managed but should the beach be closed they stand to lose out significantly.
There is perhaps a disconnect at this site regarding investment and benefits derived from the site. The site owners are responsible for management of the site but since there is no entrance fee they do not stand to gain significantly (besides those that own the restaurant). It is difficult to find a tour operator that offers a South Coast tour without a visit to Reynisfjara, however tour operators (with the exception of one tour operator) do not contribute any funds to the site as seen in Figure 13 and 14. It is in the best interest of the tour operators to contribute funds to the site for proper management if they wish to continue operating tours there.

**Benefit Derived from Reynisfjara**

<table>
<thead>
<tr>
<th>Beneficial</th>
<th>Neutral</th>
<th>Disadvantageous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tour Operators</td>
<td>Kötulsetur</td>
<td>ICE-SAR South Iceland</td>
</tr>
<tr>
<td>Tourists</td>
<td>Ferðamálastofa</td>
<td>Police</td>
</tr>
<tr>
<td>Restaurant Owners</td>
<td>Umhvervisstofnun</td>
<td></td>
</tr>
<tr>
<td>EFLA Engineering</td>
<td></td>
<td></td>
</tr>
</tbody>
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*Figure 13 Benefit Derived Graphic, Anika Truter, 2017*
Ideally Iceland would maintain the tourism industry and avoid another tragic crash leaving the country’s economy battered. Tour operators that have gone through Vakinn certification have proved their intention to view the tourism industry in the long term. These companies are certified to have minimal environmental impact as well as increased safety protocols. Although there are currently still limited statistics available on the effectiveness of Vakinn, there was a survey conducted in 2015 which asked participants about their experiences with the program. Of the 34 participants that answered the survey, 47% indicated that their newly developed safety plans played a large role in their revised business operations (Ferðamálástofa, 2015). Vakinn is drawing a clear line between those operators that are focusing only on short term profits and those that are intent on maintaining tourism resources for the future generations.

There are already steps to reducing barriers to Vakinn certification such as the tiered pricing system. However, barriers should be further reduced if possible and this certification should be incentivized by the government. It is in everyone in the tourism industry’s best interest to operate at a net benefit level. Just like vaccines, the certification system works best if
everyone is doing it. If only a few operate at this level and leave a reduced impact, others can still cause problems that will affect everyone in the industry.

5.2. Application of Best Practices at Reynisfjara

Visitor safety management strategies that have worked for other hazardous coastal tourist sites are a good starting place for the manager’s at Reynisfjara. Due to the difficulty in standardizing coastal safety practices each site will have to develop a new stand-alone plan. However, by picking from various sites that have introduced comprehensive management plans managers at Reynisfjara can implement strategies for a variety of concerns at the site.

One concern that significantly influences the site’s management is the management structure. As noted previously, the ownership structure at the site is confusing and has remained a barrier for the site’s more involved owners. Inefficient management structure at a hazardous coastal site can seriously impede the intentions of even the most comprehensive management plan. An inefficient management structure can result in slow and incomplete introduction of management initiatives. Due to the urgency of the situation at Reynisfjara the management structure requires immediate attention so that managers can quickly and efficiently implement initiatives that are appealing to all involved.

5.3. Funding

The need to improve tourism infrastructure is well recognized but funding appears to be lacking. The Icelandic government has made attempts in the past to create a revenue mechanism through a nature pass that would cost 1500 ISK per visitor to access all natural sites in Iceland however this plan did not go ahead (Fontaine, 2014). Icelanders were generally quite opposed to the nature pass due to “intrusive” enforcement practices and the idea that state-owned nature site access should always be free (Rogers, 2014). This revenue could be used to increase and improve existing infrastructure however raising the already large costs of a trip to Iceland could be risky. As of 2017 the main reason a ranger has not
been implemented (as all stakeholders are keen to see) is because of a lack of funding available.

5.3.1. Kerið and Helgafell

One Icelandic site took this issue into their own hands when they began charging a technically illegal entrance fee to their natural site (Benjamin, 2014). The managing director of Kerið, a volcanic crater near the popular Golden Circle route, said that the organization didn’t want to idly wait for the government to come up with a solution. A spokesperson for Kerið noted that landowners stand to benefit the least as they are technically not allowed to charge entrance fees but are expected to maintain and manage a site that hosts hundreds of thousands of visitors a year. Tour operators are free to use these sights for fiscal gain yet land owners are not permitted to charge an entrance fee to cover the costs of site maintenance. There is currently a room and board tax of which some portion is designated to the maintenance and protection of natural sites however this revenue is not commonly given to privately owned sites (Benjamin, 2014). Many tourist sites host delicate ecosystems that cannot be expected to maintain their integrity without monitoring and maintenance efforts. Everyone in the country seems to agree that these natural sites should be cared for immediately but there has been a distinct lack of a plan to maintain natural sites.

As of March 27th, 2017 land owners of Helgafell mountain in Snæfellsnes have decided to begin charging a 400 ISK fee. The landowners plan to use the fee revenue to build washrooms, enlarge the parking lot and have an attendant on site (Hafstað, 2017, B). The landowners have reported they received funding in 2014 from the Tourist Site Protection fund to repair damages to the area. They applied again to complete the repairs in 2015 and 2016 but were denied both times. They chose to begin charging a fee as an alternative to closing the site.
5.3.2. Current and Future Revenue Mechanisms

Currently the main mechanism for generating revenue for the maintenance of tourist sites in Iceland is the Tourist Site Protection Fund which aims to assist with maintenance costs and reduce pressure on frequented sites by promoting other tourist sites in Iceland. The stewardship of this fund is under the Icelandic Tourist Board for allocation of funds and auditing. In 2013 Reynisfjara received 2.4 million ISK from this fund for redevelopment and again in 2014, 4 million ISK was awarded for the construction of public washrooms (Ferðamálastofa, 2017).

In June of 2013 there were promises that Icelandic natural sites would begin to charge fees to cover costs of site maintenance however as of 2017 this is still not the case. In 2016 fall the Icelandic government decided to increase the levy on hotel rooms from 100 ISK to 300 ISK per night effective fall 2017 (Guðnason, 2017). Currently Iceland’s tourism minister is also considering charging tour operators for a special license that would generate funds for site maintenance (Valdimarsson, 2017). These solutions are meant to have a twofold effect, to generate revenue for site maintenance and to control the number of visitors at sites (Valdimarsson, 2017). The purpose of this is to ensure a positive experience for visitors as well as ensuring the environmental integrity of the site for future users. A bill is currently being drafted for parliament that would allow municipalities outside of urban areas to charge for parking which would facilitate the funding of parking lots at tourist sites (Guðnason, 2017). As of March 2017 there is a bill being written to increase the safety requirements of tour operators however this is still in the preliminary stages (Guðnason, 2017). Reynisfjara would be able to benefit from some of these revenue mechanisms such as the charging of parking. However, there is still a lack of support for privately owned natural tourist sites.

5.3.3. Funding Scenario: Parking lot fee

At the time of writing of this thesis there are several different legislations being submitted to the Icelandic Parliament Althingi that could affect the tourism industry as a whole, such as one that proposes a fee to tour operators. There is not currently enough information
available about the majority these bills to be able to definitely say how those scenarios would influence Reynisfjara specifically and it was beyond the scope of this thesis to systematically address these proposed bills in a detailed way. However, one bill would allow non-urban areas to charge users for parking and this would have direct links to Reynisfjara. If this bill is passed, Reynisfjara would be able to generate revenue through the parking lot that is currently at the site. There is currently no statistic on the number of cars that come to Reynisfjara each day, however it would be conservative to say that at least 50 cars and 10 busses visit Reynisfjara each day. This scenario will assume a rate of 250kr per car per hour (this is the standard parking rate in downtown Reykjavik) and 500kr per bus per hour. Given these conservative numbers Reynisfjara could generate the following revenue in one day and one year:

\[50(250) + 10(500) = 17\,500\text{ ISK}\]

\[175\,000\text{ ISK} (365) = 6387\,500\text{ ISK}\]

A portion of these funds could be designated for the installation of new safety and environmental integrity infrastructure and the subsequent maintenance of the site.

As shown in the discussion, charging for nature site access in Iceland has been a point of contention. There has been discussion about the charging of natural sites in Iceland surrounding issues of visitor’s willingness to pay (Reynisdottir, Song and Agrusa, 2008) which appears to be favorable at Icelandic sites. Research on the topic of Icelandic perceptions of entrance fees is in its infancy however, there was great opposition in public discourse to the nature pass but this could have been a result of the execution of the fee introduction. There are numerous sources indicating the potential harmfulness of the commodification of nature. However, Bermejo mentions that one person’s access to a natural site does not prevent another’s enjoyment of the site (Bermejo, 2014), but in Iceland this is not always the case. Natural sites are facing degradation due to crowding which affects the enjoyment of other site users. Furthermore, if a site is not managed properly, the enjoyment of the site users will diminish. High use sites cannot be maintained without proper funding and this funding needs to come from somewhere, which raises the question of the generation,
source, and administration of funds. This is the question that has long gone unanswered in Iceland.

5.4. Differing Attitudes Towards Safety Responsibility

In North America danger is communicated through signage so commonly that many people assume a lack of warning implies a lack of danger. While in Iceland, up until recently warning signage was minimal. Many visitors to Iceland comment on the lack of warning signs or fencing. In Iceland if you choose to visit a hazardous site or partake in a risky activity you are responsible for your assessing the situation and monitoring conditions on your own. You are expected to equip yourself properly with both knowledge and supplies for whatever situation you are entering into. You are responsible for your own decisions and you alone will suffer the consequences of those that are poorly made. However, in North America people are not as interested in accepting the consequences of their own decisions. The practice of suing others is much more common in North America because people feel the responsibility lies on site owners to communicate any and all dangers. With this being said, even when well designed teleological signs are present and people read and understand them, they still sometimes choose to ignore them (Granquist and Nilsson, 2014).

At Reynisfjara land ownership influences the community based tourism planning process as land owners have the final say in what happens. This can cause issues as all landowners are legally required to agree to a decision before it can move forward. This issue has been prominent at another Icelandic site, Jökulsárlón Glacial Lagoon where disagreements between the land owners were so persistent that the owners decided to put the land up for sale in 2014. However, the owners at Reynisfjara have proved their willingness to collaborate with other stakeholders but perhaps a unified goal has not been designated which has been a barrier to the community based tourism planning process. Reynisfjara could stand to benefit from a volunteer advisory group that would promote the best interests of the beach. There are a number of organizations around the world that use this informal approach that provides a venue for harnessing the collective energies of the various stakeholders that care about or have an interest in a site. For example, in British Columbia, Canada volunteer
advisory groups are used extensively to promote responsible use of visitor sites through visitor education and stewardship. An example of this is the, “Friends of Strathcona Park” which is a non-profit society that exists to protect a large provincial park on Vancouver Island.

5.5. Appropriate Strategies

A variety of management tools exist to address the issue of visitor safety. This is due to the vast differences that can be observed between countries and even specific sites within them. The cultural dimensions of a country dictate the values and defining attitudes which affect the way that managers from that region will address issues of visitor safety. For example, tourists from America and the United Kingdom are always quick to point out the lack of fencing in Iceland at tourist sites. This stems from a difference in the extent to which a person is responsible for his or her own conduct at a hazardous site. This has become a problem for Iceland because some tourists will assume an absence of danger or risk if there is no sign indicating such. While extensive fencing may work in other parts of the world Icelanders feel that it interferes with the experience of a natural site by providing visual pollution.

An inappropriate management tool can also have negative consequences for supportive organizations. Some management tools may require more resources, whether its personnel or monetary resources. In one example, two popular beaches in The Hague, Netherlands employ a volunteer safety patrol during the high season. The population of The Hague is 495,083 (UN Data, 2011) whereas the population of Vik (the town nearest Reynisfjara) has 318 residents. While the volunteer safety patrol in the Netherlands might provide an appropriate solution there, it would not work in Iceland as it would be placing an incredibly large burden on Vik’s miniscule volunteer rescue team (Ólafsdóttir, 2016).

It is widely recognized that at beaches lifeguards are the number one way to prevent death. However, this management tool would prove to be entirely ineffective at Reynisfjara as people are not actually entering the water. Should a person fall into the sea, it would be unsafe for someone to go in after them due to the strength of the waves and the frigid water
temperatures. The singular focus at Reynisfjara is prevention of accidents whereas with other warmer destinations the focus may be split between prevention and rescue methods. Due to the often vast differences between sites it is important to understand the situation and goals before selecting management tools.

5.5.1. Investment at Reynisfjara

In January of 2017, the Icelandic Road and Coastal Administration was granted 20 million ISK for the development of an automated wave warning system at Reynisfjara Beach (Vegagerðin, 2017). The warning system consists of a light that is linked to the already existing wave forecast produced by the Icelandic Road and Coastal Administration. The factors influencing the warning system include: wave length, wave height, tide, and weather conditions. The warning system will have a flashing light that will vary in pattern depending on the severity of the waves. The system will also stand to warn police of dangerous conditions so a temporary police monitor can be posted.

5.6. Questions of Ownership

Reynisfjara is currently experiencing issues as a result of the complicated land ownership structure which has prevented safety management initiatives from being implemented. The owners at Reynisfjara can implement a new management structure to attempt to remedy these issues however there is a chance that this change alone may not achieve the desired outcome. Should the land owners at Reynisfjara continue to experience management issues despite restructuring they should consider converting the land to public ownership. Considering that this is a safety issue where lives are at risk this option should not be out of the discussion. In North America the transition from private to public ownership has been seen at a number of sites that now belong to the federal and provincial parks systems. One example of this is Shannon Falls in British Columbia where the owner donated the land to the BC park system in 1982 (BC Parks, n.d.). These sites that were originally managed under private ownership began to experience issues due to increased visitor numbers and eventually these properties were transferred, either through purchase or donation, to state
ownership. In some cases, the transition was made more smooth by allowing the original owners of the land to continue using it for some time. This has resulted in more efficient and effective management of the sites with more available funding from the public sector.
6. Recommendations

As discussed previously, two issues that have significantly impacted management initiatives at Reynisfjara are the management structure and the limited access to funding. Based on the results and discussion the recommendations for this thesis will cover two different areas in an attempt to address these issues. The first section will provide recommendations to improve the management structure at Reynisfjara to streamline the decision-making process. The second section will provide a list of management tools that would be useful to Reynisfjara and stakeholders as well as other indirectly affiliated players. Additionally, there is a section on lessons learned that the manager’s at Reynisfjara can consider when they make decisions. The final section provides suggestions for further research to better understand the situation at Reynisfjara for management purposes.

6.1. Management Structure Recommendations

Management initiatives at Reynisfjara have been constrained by the convoluted ownership structure of the site. To overcome the ownership obstacle at the site, the creation of a non-profit stewardship council is recommended for the site. The group would be called, ‘Vinir Reynisfjörur,’ or ‘Friends of Reynisfjara’ in English. The development of this management structure would enable the stakeholders involved in Reynisfjara to discuss and potentially adopt, among other things, the revenue scenario detailed in section three of the recommendations. This group should follow Gray’s collaborative management process (Gray, 1985) as outlined in Table 1 to establish roles, outline goals and eventually address monitoring mechanisms of the project. An example of a well-developed advisory group is the Sport Fishing Advisory Board in Canada which has multiple chapters in various regions of the country. The group is steered by a set of guiding principles that include values such as: transparency, accountability, and inclusive representation (DFO, 2010). The group’s role involves providing advice, recommendations and feedback to affiliated groups such as Department of Fisheries and Oceans, the provincial ministries, and local angling communities.
The group would be responsible for fundraising and deciding on management initiatives for the site. The development of this group could have the potential to eliminate the stigma surrounding the collection of fees for private gain. As seen in figure 15 A&B it is proposed that the council would be comprised of three groups, the Land Owner Committee, the Tourism Committee, and the Protection, Safety, and Environmental Committee. The group could begin by meeting twice a year and adjusting as necessary, however the smaller subcommittees may need to meet more frequently than this. The Land Owner Committee (Landeignandefnd) would aim to have as many land owners involved as possible, as well as an elected chair that would be newly elected each year. Due to the site’s private ownership this committee would ensure that the owners are able to voice their concerns and ideas while working with the other stakeholder groups. The Tourism Committee (Ferðamálaneftnd) would consist of three representatives: a representative of the tour operators, a representative from Vik Tourism, and a representative from the Icelandic Tourism Board. The Protection, Safety, and Environmental Committee (Viðbragðsnefnd) would be comprised of a representative from ICE-SAR, a representative from the Environmental Agency of Iceland, and a representative from the South Iceland Police force.

Friends of Reynisfjara (Figure A)
6.2. Management Tool Recommendations

The recommendations provided in this section are intended to address various aspects of concern that were documented in this project. Although it is unlikely that all of these recommendations will be implemented, a combination of a number of them would likely improve the safety at this site through communication and risk mitigation. These recommendations could be used in tandem with the ‘Friends of Reynisfjara’ management structure or separately if this recommendation is not feasible in the short term. Additionally, there is a section on lessons learned from this thesis that can influence further research in the industry.

6.2.1. Recommendations for Direct Stakeholders

1. Post a ranger on site during peak hours

The ranger should be responsible for conducting continual risk assessments to provide updated knowledge of the risks developing at the site. The ranger should also utilize a color coded warning flag system to notify users of the current conditions at the site. Additionally,
the ranger should discourage climbing in the cliffs and hills as well as up the basalt columns to limit anthropogenic disturbances to natural site features and wildlife (ex. nesting puffins). A ranger position would allow for daily risk assessments as well as providing visitors with warnings and first responder services in case of an emergency.

2. **Create Website for Reynisfjara to warn of dangers before visitor arrival**

By creating a website for the site, managers could better communicate hazards with visitors prior to site arrival. The website could contain warnings about weather conditions and show images to demonstrate how aggressive the waves and undertow can be. This might inform visitors that are otherwise too excited at the site to stop and read the signage.

Alternatively, the SafeTravel website could feature a section on Reynisfjara or be featured in the warnings section of the website on particularly hazardous days. Pre-site visit warnings are part of a well-rounded visitor management plan as demonstrated by the best practices section of the literature review that features information on other hazardous coastal destinations.

3. **Encourage tourist contact points to provide warnings about Reynisfjara**

A warning sign about Reynisfjara should be placed in the visitor center in Vik as a repetition of signage in multiple places can solidify the message about site hazards. Car rental companies could also provide warnings about the site to those planning to travel on the south coast. Travel book firms such as Fodors and Lonely Planet should be contacted to include information on the dangers of Reynisfjara.

4. **Address road and parking lot issues**

The single lane road approaching Reynisfjara is hazardous considering the increasing numbers of visitors arriving at the beach. This road could be widened to accommodate two
lanes as there are large tour busses using these roads each day. Additionally, the layout of the parking lot does not allow for a drop off zone which results in hazards for pedestrians.

6.3. Lessons Learned about Icelandic Coastal Tourism

1. Land ownership issues at hazardous sites in Iceland have the possibility to interfere with safety initiatives.

The laws on land ownership in Iceland are hindering the introduction of management strategies at tourist sites. At this critical time this issue needs to be resolved to accommodate the needs of land owners who are seeking out new management strategies but have been unable to implement them due to legal issues.

2. Tour operators are not regulated enough, and are benefitting from tourist sites but doing nothing to contribute to their management.

Currently the available tourist site maintenance funds are specifically for publicly owned sites. As observed in the case of Helgafell in west Iceland, privately owned sites have difficulty accessing money from this fund. Tour operators are benefitting heavily from free tourist sites and they should be required to contribute to the maintenance of these sites. Tour operators should either contribute to the tourist site protection fund or give funds directly to site managers. It is in the best interest of tour operators to contribute to site maintenance because some sites may be forced to shut down if they do not have adequate funding which would result in a loss for all. Land owners currently have to choose between charging for site access or using their own money to maintain sites they do not fiscally gain from. Icelanders are largely against charging for natural sites but if land owners are not given funds to properly manage the site they will have to choose between closing the site or charging a fee.

3. Vakinn is a quality certification program that ensures tour operators have rigorous safety standards (some of which aim to reduce risk to visitors).
Vakinn certification should be incentivized to ensure that tour operators are providing quality, safe services that contribute to the longevity of the industry. Vakinn certification proves a firm’s dedication to providing a quality experience which could encourage return tourism. Vakinn certification also ensures well trained staff members that can respond appropriately to emergencies. Those that are Vakinn certified are required to have a neutral environmental impact which will contribute to the sustainability of the industry.

4. **If private ownership impedes on safety management, public ownership could be considered for improved site management.**

Umhverfisstofnun is currently looking into turning Reynisfjara into a protected site. This might make the site more eligible for management funds. This would also ensure more rigorous environmental protection of the site which would keep it pristine for future users.

**6.4. Recommendations for Further Research**

- Continued research on tourist perceptions of safety at Reynisfjara such as cultural differences, gender, etc
- Collect observations on tourist behaviour in response to different management tools
- Explore motives of individuals who read and then ignore signs
- Explore land ownership issues at other Icelandic sites
- Explore perceptions to various revenue mechanisms for tourist sites
- Explore Icelandic attitudes towards conversion of privately owned sites to public sites
Conclusion

The Icelandic tourism industry is beginning to experience some issues as a result of its rapid growth. The gold rush mentality of the industry has left many issues unaddressed and these shortcomings will likely become larger if not cared for. The issue of tourist safety is one that has remained neglected as a whole as industry participants “put out fires rather than prevent them.” Reynisfjara Beach has provided a case study of a hazardous coastal tourist site on the south coast of Iceland. The safety issues at this site are a symptom of a larger problem in the country in regards to the future sustainability of the tourism industry.

This study conducted at Reynisfjara Beach through the interviews and discussions with numerous stakeholders of the site has illuminated the need for improved management initiatives with a strong focus on the need for a ranger to be at the site on a regular basis. Every stakeholder that was interviewed emphasized the increasingly urgent need for a ranger at the site. As tourism continues to grow at the current rate, more visitors will be using the site and more lives will be endangered if steps are not taken to avoid this. That being said, since the death at the site in February 2016, many steps have been taken to improve safety measure at the site. These initiatives include increased and improved teleological signage as well as plans to prevent any possible accidents from hazards such as the parking lot, and a light warning system. The fact that the managers of the site are taking action to improve the parking lot before any accidents occur here shows an improvement over past methods of management that involved merely responding to accidents and not trying to prevent them.

For tourism in Iceland to be considered sustainable, potential negative experiences for tourists and operators alike must be mitigated through comprehensive management options that include the appropriate safety and site use infrastructure. As tourism increase so does the amount of injured/endangered tourists and compromised landscape. Thus far the management structure at Reynisfjara has significantly impeded on the efforts of managers to introduce safety initiatives at the site. This paired with the lack of revenue mechanism has left managers frustrated and tourists at risk.
Host stakeholders involved at a hazardous coastal site can utilize an efficient management structure to improve safety standards at a site. A streamlined management structure is an integral factor in ensuring effective and efficient management at a hazardous coastal site. This thesis designed a non-profit stewardship council modelled after a Canadian example which can potentially provide Reynisfjara with more options for funding, conflict resolution infrastructure, as well as a more streamlined and comprehensive management structure. Considering the urgent nature of the issues faced at the site, if the improvement of a management structure is not effective, the site owners can consider donation or sale of the site to the state for improved management. As this is a critical time for the development of the tourism industry in Iceland this thesis has evolved as new discussions and issues have come to light at Reynisfjara. There are other hazardous coastal sites in Iceland that could apply the ideas presented in this thesis as they grow in popularity and become high use sites. This thesis has provided an overview to coastal managers of how qualitative research methods can be used to produce management options for a hazardous coastal site.
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